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RESPONSE TO OEPA COMMENTS ON THE WASTE PIT AREA STORMWATER RUNOFF CONTROL ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

10-19-90

[redacted]

Department of Energy
FMPC Site Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6319

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OCT 19 1990
DOE-123-91

Mr. Graham E. Mitchell, DOE Coordinator
Ohio Environmental Protection Agency
40 South Main Street
Dayton, OH 45402

Dear Mr. Mitchell:

RESPONSE TO OEPA COMMENTS ON THE WASTE PIT AREA STORMWATER RUNOFF CONTROL ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

Reference: 1) Letter, Graham E. Mitchell to Bobby Davis, "Revised Waste Pit EE/CA and Responsiveness Summary," dated September 18, 1990 1915

2) Letter, Graham E. Mitchell to Bobby Davis, "Waste Pit EE/CA," dated September 20, 1990 1917

This is to transmit the enclosed responses to OEPA comments on the Waste Pit Area Stormwater Runoff Control EE/CA. Changes identified to the EE/CA document will be distributed at a later date.

If you have any questions, please contact me at (513) 738-6161 or Oba Vincent at (513) 738-6397.

Sincerely,

Andrew P. Avel
FMPC Remedial Action
Project Director

DP-84:Vincent

Enclosure: As stated

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cc w/encl.:

C. A. McCord, USEPA-V
L. August, GeoTrans (2)
K. Davidson, OEPA-Columbus
R. E. Owens, ODH-Columbus
M. Higgins, ASI/IT
I. W. Diggs, WMCO
D. Mayfield, ASI/IT

ATTACHMENT
DOE RESPONSES TO OHIO EPA COMMENTS ON THE AUGUST 1990 REVISED ENGINEERING EVALUATION (EE/CA) FOR THE WASTE PIT AREA STORM WATER RUNOFF CONTROL PROJECT AND ACCOMPANYING RESPONSIVENESS SUMMARY

Comment 1. Page ES-1, last paragraph: the reference to the National Contingency Plan of April 1990 is still incorrect. The citation given in the text to 55 Federal Register 8666 is the March 8, 1990 final rule publishing the NCP with an effective date of April 9, 1990. Stating that the NCP is dated April 1990 while citing the March 8, 1990 Federal Register notice is confusing and misleading. The date should therefore be changed to March 8, 1990.

Response. DOE concurs that the 55 Federal Register 8666 contains the March 8, 1990 final rule publishing the NCP. However, the EE/CA is intended to reflect the date on which the NCP became effective on the date April 9, 1990. This also applies to the references made in Section ES, page 1 and Section 1.0, page 1. The Federal Register citation will be clarified in the addendum to the Waste Pit EE/CA.

Comment 2. Page ES-6, Table ES-1, Alternative 4, Effectiveness: Environmental: Though a reduction in uranium loading to Paddys Run will occur there will be additional loading of uranium into the Great Miami River at the outfall. Contaminants are essentially being removed from one system and dumped into another, since only approximately 7% of the total waste pit surface runoff will be treated by the Pilot AWWT Facility.

Response. Comment is noted. However, alternative 4, runoff collection and treatment, meets the objective of this Removal Action as stated on page ES-2. It should be noted that this action represents a major step in the phased approach at site-wide waste water control. This long-term plan was outlined on page 4-11 of the EE/CA.

Comment 3. Page ES-8, second paragraph: The fact that the volume of waste will probably increase as a result of Alternative 2, since capping material will likely be contaminated, should be included in this paragraph.

Response. DOE concurs that at the time of cover materials removal the synthetic liner may have to be treated as a waste material. However, this would comprise less than 1 percent of the total material removed (Section 4.2.2, page 4-5), therefore, it is not mentioned in the Executive Summary.

Comment 4. Page ES-9, fourth paragraph: The last sentence states that Alternative 4 costs approximately one-half of the cost of Alternative 2. Because of cost revisions to both alternatives from the draft EE/CA, Alternative 4 is now about 2/3 of the cost of Alternative 2. This sentence, therefore needs to be revised.

Response. DOE concurs. The cost of Alternative 4 is approximately 2/3 of the cost of Alternative 2. These are approximate costs and may be subject to change. The fact that the cost of Alternative 4 is approximately 2/3 the cost of Alternative 2 is made in Section 6.3, page 6-5, detailing Alternative 4 as the preferred alternative.

Comment 5. Page 1-1, last paragraph: See Comment # 1.

Response. See Response 1 above.

Comment 6. Page 2-16, Section 2.3, Analytical Data: Careful evaluation of the data indicates a high degree of variability in the presence of uranium in the waste storage area. The possibility of optimizing the economical operations of the proposed alternative needs to be considered to minimize the operational and maintenance costs of the AWWT and the biodentrification towers, and to minimize down time.

Response. Utilization of the Biodenitrification Surge Lagoon (BSL) will achieve both flow and concentration equalization for all flows entering the biodenitrification towers and will help to serve the same purpose for the proposed Advanced Waste Water Treatment (AWWT) facility. This will help "to minimize the operational and maintenance costs of the AWWT and the biodenitrification towers".

Comment 7. Section 2.3.2, General comment: Sulfate, fluoride, chromium, total suspended solids, and total dissolved solids were found at levels which exceeded either MCLs or NPDES limits. Proposed Alternative 4 fails to consider the need for removal of these contaminants from collected surface water runoff.

Response. DOE concurs that these constituents were detected at levels exceeding MCLs or NPDES limits. However, Alternative 4 includes collection and pumping of surface water runoff to the Biodenitrification Surge Lagoon, where suspended solids would settle prior to treatment through the Biodentrification Towers. Additionally, waste waters will be pumped through the general sump to the existing waste water treatment facility. Further, the proposed construction of the Advanced Waste Water Treatment (AWWT) Facility is designed to remove these constituents to acceptable levels through the use of ion exchange, reverse osmosis, of a combination of both (Section 2.1.3, page 2-9), meeting MCLs and NPDES limits. The flow diagrams in Figures 4-6 and 4-7 illustrate the current and proposed waste water flows.

Comment 8. Page 2-26, second paragraph: This paragraph refers to the highest concentration of fluoride being sampled from location DD-12 by Weston. This location should be presented in Figure 2-6.

Response. Sample location DD-12 (Weston) is now shown on a revision to Figure 2-6. The revised Figure will be included in the addendum to the waste pit EE/CA.

Comment 9. Page 2-33, second paragraph: Stating that efforts to protect against uranium will also protect against other contaminants is misleading since only 7% of the estimated total surface runoff collected (based on Figure 4-7) will be treated in the Pilot AWWT Facility.

Response. See response to Comment 7, above.

Comment 10. Page 2-34, first full paragraph: In the last sentence, the name "sledges" should be corrected to "sedges."

Response. DOE concurs. The word "sledges" will be changed to "sedges" in the addendum to the Waste Pit EE/CA.

Comment 11. Page 3-1, fourth paragraph: As mentioned by Ohio EPA in previous comments on the draft EE/CA, since the various uranium isotopes mentioned here have potential carcinogenic effects, it is not appropriate to merely look at the sum of the ratios of the observed concentration of each radionuclide to its corresponding DCG as if the only interest is a hazard index-type toxicity effect. Since the DCGs, even where their ratio is less than 1, would only increase the cancer risk further above the 10^{-6} level.

Response. The derived concentration guide (DCG) for each radionuclide in water is based on a radiation dose equivalent of 100 mrem per year of intake and on an assumed ingestion rate of two liters of drinking water per day (730 liters per year). For multiple radionuclides, if the sum of the ratios of the calculated concentration of each radionuclide to its corresponding DCG is equal to unity, then the total radiation dose equivalent is 100 mrem per year from all of the radionuclides considered. This is based on an ingestion rate of 730 liters of drinking water per year. The use of DCGs as concentration limits for radionuclides in surface water is a method by which reference values can be presented to standardize concentration limits for liquid effluent from DOE facilities. It is not implied that ingestion of surface water effluent from a DOE facility actually occurs, but rather, if ingestion of 730 liters per year of surface water at a concentration equal to the DCG occurs, there is a radiation dose equivalent of 100 mrem.

It is not reasonable to assume that surface water from Paddys Run will be ingested directly as drinking water at a rate of 730 liters per year, or even a small fraction of this ingestion rate. Because of the intermittent nature of water flow in Paddys Run and because of the availability of a generous supply of water from the Great Miami River and potable water from the Great Miami Aquifer, water from Paddys Run is not used as a potable water supply or for ingestion. An assessment of the actual or potential risks to human health from surface water releases must be performed on a site specific basis as is presented in Appendix C of the EE/CA.

Comment 12. Page 3-1, fourth paragraph: The previous comment notwithstanding, the DOE DCG for average total uranium concentration (550 pCi/l) should also be included in this section.

Response. DOE believes that a sufficient discussion of the DCGs for uranium isotopes, as well as for other radionuclides detected in surface water samples in the waste storage area, is presented in Section 2.3.2.3 of this report.

Comment 13. Figure 4-3: As commented on previously, the accumulation trenches (as they are referred to in Section 4.2.3, page 4-5 of the revised EE/CA), should be clearly identified as such in the legend.

Response. The accumulation trenches are now identified in the legend of revised Figure 4-3. The revised Figure will be included in the addendum to the waste pit EE/CA.

Comment 14. Page 4-8, Section 4.2.4: The AWWT pilot plant which DOE proposes to construct to treat wastewater from the biodenitrification surge lagoon should be enlarged to enable it to treat the entire average storm water runoff flow (24 gpm) from Alternative 4.

Response. It should be noted that the pilot scale treatment system that was proposed for use in treating the BSL water in this removal action is the same unit which is currently being leased for demonstration of the various technologies applicable to the AWWT facility. The demonstration unit would simply be relocated from Manhole 175 and installed at the BSL for use in treating the combined flows in the BSL.

In a proposal to U.S. EPA dated September 28, 1990, the DOE has offered to construct a 150 gpm wastewater treatment system which will treat FMPC effluent prior to being discharged to the Great Miami River. If this proposal is accepted, the 10 gpm pilot scale treatment system will not be installed. Funding that would have been utilized for the purchase and operation of the 10 gpm pilot scale unit will be redirected and used for the procurement and operation of this larger unit.

Comment 15. Page 4-8, Section 4.2.4, second paragraph: Drainage Area A is considered by DOE to be "relatively noncomtaminated." No sampling appears to have been done in this area and no analyses have been provided to backup this statement. The fact that this area is adjacent to contaminated Areas H and I makes the validity of this statement questionable.

Response. Surface water runoff sample points located in Drainage Area A are listed in Tables 2-1, 2-2, 2-3, and 2-4. Most of these sample points were not shown on Figure 2-6 which has now been revised to indicate their locations. Section 4.2.4, second paragraph does not state that "Drainage Area A is considered by DOE to be relatively noncontaminated." The second paragraph does state that "Drainage Area A is expected to be relatively noncontaminated if isolated from storm water runoff from adjacent areas." The remainder of the paragraph discusses the isolation of Area A implementation to prevent contamination runon from Areas H and I, as well as C, E, and F.

In 1986 a project was initiated to control the storm water runoff from the Plant 1 Storage Pad area (PA 40-86602 - Surface Water Control of Plant 1 Storage Pad). Prior to completion of this project, storm water runoff from several portions of the Plant 1 Storage area flowed to Paddys Run via drainage ditches within the Waste Pit Area. The implementation of this project redirected the storm water flows from these portions of the Plant 1 storage pad to the site Storm Sewer System. The areas controlled by this project included areas H and I. This was accomplished by modifying a portion of the storage pad to include a curb around the periphery to keep storm water confined to the existing pad drainage system. The drainage line from this drainage system was redirected from its previous termination point which flowed to the Waste Pit Area and directed to the Storm Sewer System. Also, northern sections of the storage pad that flowed over the grassy area to the west and then through the Waste Pit Area were redirected to the Storm Sewer System. This was accomplished by plugging the culvert that led to the Waste Pit Area and reversing the drainage ditch flow. A new storm sewer inlet was then added to accommodate these flows. These actions effectively controlled the contaminated storm water runoff from Plant 1 Storage Pad Drainage to Paddys Run.

This project was completed in October of 1988. Storm water runoff sampling was conducted before and after this project was completed. Total uranium data for four sampling points within Drainage Area A is presented below. Sampling point 24 represents a combination of flow from Drainage Areas H, I, and A. Sampling point 13 represents runoff that flowed through Drainage Area A from Drainage Area I. The majority of the flow to this sampling point was eliminated with the aforementioned project. Sampling points 28 and 29 represent runoff that flowed through Drainage Area

A from Drainage Area H. Sample point 28 is slightly downstream of point 29. The majority of flow to sample point 29 was eventually eliminated as a result of the project.

Drainage Area A
Total Uranium (mg/l) for Storm Water Runoff

Sample Date	13	28	29	24
2/1/88	6.28	2.23	5.28	0.698
3/2/88	1.18	Dry	2.80	0.680
3/3/88	5.12	5.86	8.12	1.50
3/25/88	1.52	1.12	0.980	0.340
10/88 Surface Water Control of Plant 1 Storage Pad Project				
3/21/89	0.370	0.600	0.45	0.120
9/14/89	0.210	0.380	Eliminated	0.120
11/8/89	0.333	0.586	Eliminated	0.223
2/15/90	0.170	0.257	Eliminated	0.111

This data illustrates the reduction in contaminated storm water runoff reaching Paddys Run achieved by the rerouting of Drainage Areas H and I to the Storm Water Retention Basins. The contamination levels at sample point 24 are believed to be representative of the levels that will continue to flow to Paddys Run from Drainage Area A after the implementation of this removal action. These levels are well below the DOE Derived Concentration Guidelines.

Comment 16. Page 4-9, second paragraph: No actions are suggested to minimize infiltration in this area of restricted flow and watershed storage. Steps to prevent infiltration should be discussed here, as they were for other restricted flow areas.

Response. The detention area that is discussed here is Drainage Area J. This drainage area is discussed on page 4-10, fourth paragraph. This was simply a redundant description of this area to illustrate its relationship to Drainage Area C.

Comment 17. Page 4-10, second paragraph: This paragraph suggests Drainage Area G is relatively clean and that no runoff control is needed here. Ohio EPA questions how such a decision can be made since, as illustrated by Figure 2-6, little if any sampling has occurred in this drainage area. Soils in this area may be contaminated as a result of runoff from other areas and may continue to be a source of contaminant release into Paddys Run.

Response. Much of the storm water runoff from Drainage Area G and portions of Drainage Area D infiltrates within Drainage Area G. The remaining runoff flows to Paddys Run via a culvert under the west berm of Drainage Area G. Under this removal action, the runoff from Drainage Area D will be collected in the new Collection Sump and will no longer go to Drainage Area G. The existing culvert from Drainage Area G to Paddys Run will be plugged and the water from Drainage Area G will be allowed to infiltrate. Drainage Area G will also serve the purpose of providing emergency overflow capacity for the new Collection Sump in the event of a storm in excess of a 100 year/ 24 hour event.

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Any localized contamination that may be discovered during construction in Drainage Area G can be removed per FMPC-720, Construction Rubble Disposition procedure.

Comment 18. Page 5-5, Section 5.2.1: As stated in a previous comment letter, Ohio EPA strongly disagrees with DOE's statement that "...no imminent and substantial endangerment currently exists for any off-site receptor...." The agency also disagrees with the statement that "...the contribution of contaminants to Paddys Run and the aquifer from storm water runoff from the waste storage area does not represent an imminent and substantial endangerment." The DOE interpretation of what constitutes "imminent and substantial endangerment" is a much narrower interpretation than that of either Ohio EPA, USEPA, or CERCLA. In fact, the existence of a CERCLA 106 order for this site requires (by USEPA policy) an imminent and substantial endangerment to be present. Further, if no imminent and substantial endangerment existed at the FMPC site, there would be no need to conduct an RI/FS (which is by no means complete) or any of the removal actions that are currently being planned. These statements should be deleted from the text or alternative language used since their accuracy is very questionable.

Response. The scope of this report, as stated in Section 1.0 of the report, is to analyze removal action alternatives for the storm water runoff control for the waste pit area. DOE maintains that, based on analyses of existing conditions in Paddys Run and the regional aquifer, there currently is no imminent and substantial endangerment for any off-site receptor under the most plausible exposure scenarios.

Comment 19. Page 5-7, Section 5.2.1, first paragraph: The calculated value of 80 g/l, which exceeds 30 g/l, is dismissed due to its "extreme conservatism." On what technical points is this value dismissed, if any? What alternative or more representative calculated value can be provided?

Response. The first bullet on page 5-6 of the same section presents two major technical points in support of the assertion that the calculated value is conservative. However, the value of 80 g/ml is not dismissed. Rather, it is used to support the assertion that the no-action alternative is not acceptable.

Comment 20. Page 5-10, fourth paragraph: The discussion of the effect of the capping alternative on the environment should include the fact that such a large amount of surface soil movement will increase sedimentation rates into Paddys Run and will affect the aquatic community.

Response. Paddys Run has a highly variable flow and routinely experiences heavy sedimentation associated with runoff from the surrounding agricultural land, as well as the FMPC. Sedimentation would therefore not be an unusual stress on the aquatic community. Also, Paddys Run is separated from the Waste Pit Area by a vegetated berm, such that sediment would be routed into Paddys Run only though the small drainages along the railroad tracks and north of Silo 4. These drainages are also vegetated, by cattails, which would act to slow runoff and reduce sediment addition to Paddys Run. Sedimentation would be further minimized by the use of standard mitigation techniques in construction and by the fact that no soil would be excavated. Rather, additional soil would be placed on the existing surface (see Page 4-4, Line 1). Any effects on the aquatic community should be limited to the period of construction (12 months), and complete recovery would be expected within 6 to 12 months.

Comment 21. Page 5-14, Table 5-1: Table 5-1 is not cited anywhere in the text. It is unknown as to where it fits into the document.

Response. Table 5-1 provides data on uranium concentrations in filtered vs. unfiltered samples. This comparison provides a basis for determining whether a potential contaminant may migrate in solution or as a suspended solid. The data in this table shows that there is very little difference between the two screening methods of analysis indicating that uranium does have a potential for migrating in solution (i.e., uranium is not significantly filtered from the sample). Further, for proper comparison with unfiltered uranium data provided by Weston, this report used the same from ASI/IT samples (Section 2.3.2.3). A reference to table 5-1 and its conclusion will be included in the addendum to the Waste Pit EE/CA.

Comment 22. Section 5.4, General Comment: A uranium removal efficiency of 10% is proposed by the biodentrification surge lagoon. The efficiencies for the biodenitrification towers, effluent water treatment system, and the AWWT system are unknown. Information regarding these efficiencies are necessary for the evaluation of Alternative 4 (i.e., effectiveness on the environment, reduction in toxicity, mobility, and volume), compared to those of other alternatives. What are the operation and maintenance requirements of this system, specifically removal media, media lifetime, exhausted media disposal/regeneration requirements, and how the system will be cleaned and closed? Alternative 4 also neglects the subsurface flow.

Response. The EE/CA document takes credit of a maximum of 10% uranium removal via settling in the biodentrification surge lagoon (Table 5-1). On this basis, the alternatives were evaluated and it was determined that Alternative 4 would be the best alternative. Therefore, any additional uranium removed by treatment systems downstream of the BSL would be considered an added benefit, but not quantified at this time.

The uranium removal efficiencies for the biodentrification towers, and effluent treatment system are unknown at this time. It is anticipated that the AWWT system will remove uranium to less than 20 ppb.

In a proposal to U.S. EPA dated September 28, 1990, the DOE has offered to construct a 150 gpm wastewater treatment system which will treat FMPC effluent prior to being discharged to the Great Miami River. If this proposal is accepted, the 10 gpm pilot scale treatment system will not be installed as part of this removal action.

Comment 23. Page 5-15, Section 5.4.4: This section should include a discussion of the benefits of Alternative 4 to control sedimentation and runoff which may occur as a result of construction for the final remedy for Operable Unit 1.

Response. The comment is noted. Alternative 4, will provide significant benefits to any final remedial action construction activity for Operable Unit 1 by controlling sedimentation and runoff from these activities.

Comment 24. Page 5-16, Section 5.4.4: There is no discussion of what the potential final remedial alternatives are for each of the operable units to provide a basis for evaluating the consistency of Alternative 4 against them. Alternatives being considered as final remedies should be presented so that it is clear what the relationship is between interim and final alternatives.

Response. A discussion of potential final remedial action alternatives retained for detailed analysis for Operable Unit 1 and Operable Unit 5 is attached to this document.

Comment 25. Page 6-2, Table 6-1: Alternative 4, Environmental Effectiveness: This evaluation factor should specifically state that along with the reduction of uranium loading to Paddys Run, an increase in uranium loading to the Great Miami River will also occur.

Response. Table 6-1 is intended to provide a summary of the information presented throughout the EE/CA document. The estimated loading of uranium to the Great Miami River is clearly presented in section 5.4.3, Effectiveness; Reduction in Toxicity/Mobility/Volume, page 5-15.

Comment 26. Appendix A - Cost estimate for Alternative 4: Alternative 4 is the preferred alternative, but the cost estimate is less detailed than any of the others. The estimate is simply a summary, and does not address collection system, biodentrification towers, AWWT facility, nor operations and maintenance costs. If these costs have truly not been included, it is not clear how this cost estimate can be compared with that for the other alternatives. What are the capital costs for these elements, and if they are not to be considered part of Alternative 4, how will they be addressed as a part the pending remedial actions at the facility? A cost analysis for the preferred alternative in an EE/CA should be detailed enough to clearly include all major elements of the alternative in order to provide a realistic cost comparison against other alternatives.

Response. The issue of the level of detail for the cost estimate for alternative 4 was raised during comment resolution in an earlier version of the EE/CA. The resolution to the previous comment was to include the detailed estimate for this alternative as part of the Responsiveness Summary. Please refer to the Responsiveness Summary provided for this information.

Comment 27. Appendix B, Table B-3: This table shows a discharge of actinium in excess of 200% of DOE's own standard. Why was this element not tested for previously? What is the source of this loading? Were any of the samples in the waste pit area analyzed for actinium? Actinium may be another contaminant of concern for this Operable Unit and should be discussed in the document.

Response. As with all radionuclides listed in Table B-3 for which quantities and concentrations are proceeded by the "less than" symbol ("<"), the quantities and concentrations may have been zero (i.e., no activity present in the sample). An analytical detection limit is normally chosen as a small fraction of the standard limit, but this is not always possible due to limitations of analytical methods. Table B-3 does not show a discharge of actinium-227 in excess of 200% of the DCG, but rather Table B-3 shows that the concentration of actinium-227 is less than 217% of the DCG. The degree to which the concentration is less than 217% of the DCG cannot be determined due to the limitations of the analyses. The actinium-227 concentration could be as low as approximately 0 pCi/l.

Actinium-227 is not expected to be present in large quantities in the waste pit area since it was removed from much of the incoming materials at other DOE facilities prior to being shipped to the FMPC. Quantities of actinium-227 are present in the waste storage silos (silos 1,2, and 3). Although there is no indication that actinium-227 has been released from the silos, surface water samples were analyzed for this radionuclide. There

is no justification for including actinium-227 as a contaminant of concern in this report, but it is a contaminant of potential concern for Operable Unit 4. The analytical procedure for determining the concentration of actinium-227 in water is being reviewed to determine how a detection limit less than the DCG can be achieved for future sample analyses.

Comment 28. Appendix C, page C-12: It is not appropriate to use 1 l/day as an average intake of water for risk assessment purposes. USEPA uses a standard 2 l/day value and does not suggest that this is necessarily a maximum daily intake.

Response. NRC's Regulatory Guide 1.109 recommends on average drinking water consumption rate of 370 l/yr. (1 l/day), and a drinking water rate for the maximally exposed individual of 760 l/yr. (2 l/day). EPA's Human Health Evaluation Manual (Remedial Action Guidance for Superfund, Part A) and EPA's Exposure Effects Handbook both recommend an average water consumption rate of 1.4 l/d (511 l/yr.) and worst case drinking water consumption rate of 2 l/d (760 l/yr.). Using EPA methodology, the diet fraction for the average individual's contaminated water consumption is 0.75, and the rate of contaminated water uptake by the average individual is the product of 0.75 and 1.4 l/d or 1.05 l/d which is virtually the same number as the NRC value (NRC does not take credit for this "diet fraction"). Therefore, EPA methodology does support the use of 1.0 l/day for the average consumption of contaminated water and a value of 2.0 l/day as a worst case consumption rate.

Comment 29. Appendix C, pages C-15, C-16, and C-18: The basis for the various ingestion rates given on these pages must be given in the EE/CA.

Response. The lack of references for specific values of the exposure parameters used in Appendix C has been noted. The sources for specific values used for the exposure assessment will be presented in the addendum to the Waste Pit EE/CA.

Comment 30. Appendix C, page C-25 - Carcinogenic Effects: It is inconsistent with USEPA risk assessment methodology to calculate carcinogenic risks in terms of "risk of fatal cancer." USEPA does not separate carcinogenic risks into fatal and non-fatal. DOE's presentation of carcinogenic risk in this manner is very misleading and can give the appearance that carcinogenic risks are smaller than they really are.

Response. USEPA does differentiate between fatal and non-fatal cancer risks. See pages 10-7, 10-24, 10-29, and 10-31 of EPA's Risk Assessment Guide for Superfund, Volume I: Human Health Evaluation Manual (December, 1989). This source states that "approximately 50% of all of the cancers induced by radiation are lethal." DOE's presentation of carcinogenic risk is not intended to mislead a reader, but rather to clearly state the calculated excess risk of fatal cancers from implementation of each of the four alternatives.

COMMENTS ON THE RESPONSIVENESS SUMMARY

Comment 1. Section 1, page 3, DOE response to general comment on treatment issues, second paragraph: It is stated here that the AWWT pilot plant will be capable of treating storm water runoff to 20 ppb which is below the 30 ppb proposed by DOE as the allowable concentration of uranium in groundwater. What impacts would this 20 ppb level have on aquatic organisms?

Response. Since the pilot scale treatment plant will treat only a small portion of the existing effluent entering the Great Miami River, aquatic organisms will initially be exposed to the existing effluent uranium concentration of 690 pCi/l (approximately 1 mg/l), rather than 20 ppb (20 g/l). Untreated, undiluted effluent may affect aquatic organisms, but a 20 of 30 ppb standard for uranium, if chosen for the FMPC, would be protective of aquatic life. The 48 hour LC50 for Daphnia magna, a sensitive invertebrate species, is 6 mg/l, with effects on reproduction detectable at levels of 0.5 mg/l and higher (Poston et al., Water, Air, and Soil Pollution, 22: 2889-298). The latter value is 25 times the 20 ppb level produced by water treatment. Additionally, FMPC effluent is diluted by a factor of at least a hundred, based on the 10 year low flow, when it enters the Great Miami River.

Comment 2. DOE response to Ohio EPA Comment # 1, page 2, fourth paragraph: Risk assessments performed for the FMPC must be fully consistent with USEPA risk assessment guidance including the Health Effects Assessment Summary Tables. In the latest update of the HEAST (First/Second Quarters FY-1990, OSWER document OS-230, January/April 1990), to estimate risk-specific concentrations in drinking water, for example, a specified level of risk is divided by the unit risk for drinking water. Hence, the water concentration (in pCi/l) that corresponds to a best estimate of the increased lifetime cancer risk of $1x10^{-6}$ is calculated as follows:

$$\text{pCi/l in water} = \frac{1x10^{-6}}{\text{unit risk in (pCi/l)}^{-1}}$$

For Uranium 235 and 238, the pathway-specific unit risk given in Appendix C of the HEAST for exposure over a 70 year lifetime is $6.6x10^{-6}$ $(pCi/l)^{-1}$. Using this value for the unit risk in the above equation, the concentration of uranium in groundwater corresponding to a 10^{-6} excess lifetime cancer risk is 0.15 pCi/l (0.23 g/l). For uranium 234, the concentration is slightly lower (about 0.21 g/l). This means that the 30 g/l concentration used by DOE in the waste pit EE/CA corresponds approximately to a lifetime cancer risk of $2x10^{-4}$, which is outside the 10^{-6} to 10^{-4} acceptable risk range specified in the NCP. It must also be remembered that although the CEDE of 4 mrem is used to establish MCLs for other radionuclides, MCLs are not merely health or risk-based since other factors such as economic impacts of water treatment are also considered when establishing MCLs.

Response. From an evaluation of the HEAST reports, it appears as though U.S. EPA is using a risk factor of 5×10^{-7} $mrem^{-1}$ for uranium isotopes. Based on an ingestion rate of 2 liters per day for 365 days per year for 70 years, and a dose conversion factor (DCF) from Federal Guidance Report No. 11 for ingestion of uranium having natural isotopic ratios (DCF = 2.69×10^{-4} mrem/pCi), the lifetime risk due to drinking water with a uranium concentration of 20 pCi/l is approximately 1×10^{-4}. The proposed allowable concentration of uranium in groundwater (20 pCi/l) is based on an annual dose limit of 4 mrem and is not derived from an acceptable risk of 1E-06.

Comment 3. DOE response to Ohio EPA Comment # 5, page 3: See comment # 1 above on the Revised EE/CA.

Response. DOE concurs that the 55 Federal Register 8666 contains the March 8, 1990 final rule publishing the NCP. However, the EE/CA is intended to reflect the date on which the NCP became effective on the date April 9,1990. This also applies to the references made in Section ES, page 1 and Section 1.0, page 1. The Federal Register citation will be clarified in the addendum to the Waste Pit Area Storm Water Runoff Control EE/CA.

Comment 4. DOE response to Ohio EPA Comment # 10, page 4: DOE's response is inadequate as it did not address the original comment. The original comment was: Besides the DOE DCG for surface water release, are there any other state or federal surface water standards or criteria for uranium or other nonradiological compounds (such as chromium, TDS, TSS, fluoride, etc.) which are exceeded by the storm water runoff?

Response. Yes DOE concurs as noted in OEPA comment 7. Uranium, which is the only designated contaminate of concern for the storm water runoff control action (see Section 2.4.3.1, page 2-33), is excluded from Federal and Ohio water quality standards. However, DOE has self regulated uranium exposure to employees and the public (i.e., DOE DCGs for uranium and other radionuclides, see Section 5.5, page 5-18). Additional standards or criteria for other nonradiological compounds in the storm water runoff, of which most exceedances are sporadic and within the range of uncertainty in the data (Section 2.4.3.1, page 2-33), are found in the Ohio Water Quality Standards and the Federal Clean Water Act which are included in the contaminant-specific and action-specific ARARs lists, as well as the TBC list found in Table 5-2, pages 5-19 through 5-23.

Comment 5. DOE response to Ohio EPA Comment # 14, page 5: DOE's response does not address the original comment. Please provide an adequate response.

Response. The derived concentration guide (DCG) for each radionuclide in water is based on a radiation dose equivalent of 100 mrem per year of intake on an assumed ingestion rate of two liters of drinking water per day (760 liters per year) and not derived from a risk limit. For multiple radionuclides, if the sum of the ratios of the calculated concentration of each radionuclide to its corresponding DCG is equal to unity, Then the total radiation dose equivalent is 100 mrem per year from all of the radionuclides considered. The use of DCGs as concentration limits for radionuclides in surface water is a method by which reference values can be presented to standardized concentration limits for liquid effluent from DOE facilities. It is not implied that surface water effluent from a DOE facility occurs, but rather, if ingestion of 730 liters per year of surface water at a concentration equal to the DCG will deliver a radiation dose equivalent of 100 mrem.

It is not reasonable to assume that surface water from Paddys Run will be ingested directly as drinking water at a rate of 730 liters per year, or even a small fraction of this ingestion rate. Because of the intermittent nature of water flow in Paddys Run and because to the availability of a generous supply of water from the Great Miami River and potable water from the Great Miami Aquifer, water from Paddys Run is not used as a potable water supply of for irrigation. An assessment of the actual releases must be performed on a site specific basis as is presented in Appendix C of the EE/CA.

Comment 6. DOE response to Ohio EPA Comment # 16, page 5 and 6: Ohio EPA's original comment was not to suggest that the waste pits constitute sanitary landfills and should be reclassified as such. The intent of the comment was to point out that it is likely that in the past, these pits did receive what would today be considered to be solid waste (in addition to chemical and radioactive wastes). Like most "sanitary landfills" that in the past accepted chemical wastes, these waste pits, if capped as part of the final site remedy, would need to meet at least some minimum level of technical adequacy such as the Best Available Technology provisions of OAC3745-27-11 for capping. It is also pointed out that the solid waste regulations which DOE cited in its response are not the current regulations. The state's solid waste regulations were recently revised and became effective earlier this year. Under the revised regulations, the waste pit caps as proposed in the EE/CA, with the exception of the RCRA-type cap, would not meet the technical requirements of these regulations.

Response. DOE concurs. However, the intent of the EE/CA is to present and analyze removal action alternatives initially as interim solutions pending the outcome of the FMPC RI/FS being conducted for Operable Unit 1. Alternative 2, capping, would satisfy the short-term public health criterion and the objective of reducing uranium loading to Paddys Run. If capping is part of the Record of Decision (ROD) for Operable Unit 1, the cap will meet both state and federal regulations for long-term cap design and maintenance.

Comment 7. DOE response to Ohio EPA Comment # 19, pages 6 and 7: While Ohio EPA could envision placing a new cap over an existing synthetic liner, we do not understand how an existing synthetic liner could otherwise be "integrated" into a final cap design. Ohio EPA also believes that DOE is being somewhat inconsistent since in its submittal of the initial screening of alternatives for Operable Unit 1, DOE was critical of the lack of long-term effectiveness of using a synthetic liner for waste pit capping and chose not to use one. Now DOE appears to be supporting the use of a synthetic liner.

Response. While the long-term effectiveness of a synthetic liner cap in and of itself is questionable, its use as an interim measure is acceptable since it satisfies the short-term public health criterion and the objective of reducing the uranium loading to Paddys Run. Also, this synthetic liner cap would be "integrated" into the final cap design only so far as it would be left in place providing an additional barrier to infiltration, with an additional cap placed on top, should a new long-term cap be proposed as the final remedial action through the ROD for Operable Unit 1.

Comment 8. DOE response to Ohio EPA Comment # 21, page 7: DOE's response to Ohio EPA's comment regarding the need to clearly identify in the legend of Figure 4-3 the accumulation trenches was to request that Ohio EPA clarify the term "accumulation trenches." By way of clarification, Section 4.2.3, page 4-5, of the EE/CA states: "The flow would be collected in an accumulation trench downgradient of the cap." Given this clarification, please identify these trenches in the legend on Figure 4-3.

Response. The accumulation trenches are now identified in the legend of revised Figure 4-3.

Comment 9. DOE response to Ohio EPA Comment # 22, page 7: DOE's response is inadequate and not responsive to the original comment.

Response. First, DOE believes the reviewer is requesting a hazard quotient be determined for the uranium, which was done. Second, risks to individuals from uranium exposures via all pathways are addressed in the risk assessment contained in Appendix C of the EE/CA.

Comment 10. DOE response to Ohio EPA Comment # 24, page 8: DOE's response is inadequate. See Comment # 18 above on the revised EE/CA.

Response. The scope of this report, as stated in Section 1.0 of the report, is to analyze removal action alternatives for the storm water runoff for the waste pit area. DOE maintains that, based on analyses of existing conditions in Paddys Run and the regional aquifer, there is currently no imminent and substantial endangerment for any off-site receptor under the most plausible exposure scenarios.

Comment 11. DOE response to Ohio EPA Comment # 27, page 8: It appears that DOE did not clearly understand this comment. See Comment # 19 above on the revised EE/CA for clarification.

Response. The value of 80 g/ml is not dismissed. Rather it is used to support the assertion that the "no action" alternative is not acceptable.

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