

[REDACTED]

From: [REDACTED] LRB
Sent: Wednesday, February 19, 2003 1:54 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: Painesville Response to Stakeholder Comments

Painesville Team:

Attached are responses to the comments received from Ohio EPA, Ohio Dept. of Health, and Crompton Corporation, on the Remedial Investigation/Feasibility Study (RI/FS) Report for the Painesville FUSRAP Site. We will finalize the RI/FS Report based on these responses, with the intent of releasing the final RI/FS by the end of February. If you have any questions, feel free to e-mail me or call me at (716) 879-4287. Thank you.

[REDACTED]
Painesville Project Manager



response to
omments-crompton..comments-ohio.pdf



response to

Environmental Engineer
U.S. Army Corps of Engineers

COMMENT/RESPONSE PACKAGE

PROJECT: Painesville FUSRAP Site - Focused Remedial Investigation/Feasibility Study Report
 REVIEWER: [REDACTED] DATE: 11/13/2002

COMMENT NUMBER	SECTION	COMMENT	RESPONSE
REMEDIAL INVESTIGATION			
1	Executive Summary	The Executive Summary of the Remedial Investigation Report contains a discussion of potential impacts to environmental receptors. Please clarify the following statements. " Screening benchmarks are set at a point where impacts to environmental receptors are expected to become evident. No radionuclide of potential concern exposure point concentration exceeded its screening benchmark at any exposure unit."	The statement indicates that there are no AEC related radionuclides that passed the screening benchmark comparison. This means that there are no AEC related radionuclides that present an "evident" risk to ecological receptors. The text has been modified to say "No radionuclide of potential concern exposure point concentration exceeded its screening benchmark at any exposure unit therefore no AEC related ecological COCs were determined.
2	2.1.4 Surface Drainage	"According to UCC their waste pond was constructed in 1965 and never received any discharges from DMC activities." Has the pond been sampled to verify this statement? If not how can it be eliminated as a potential exposure pathway?	The pond in question was sampled in the 1996 sampling event. Both sediment and water samples were taken and showed no evidence of AEC related contaminants. (USACE.1998a, Section 3.9) This fact will be included in this section
3	2.3.3 Removal Action	" The objective of the removal action was to remove material identified in the Engineering Evaluation/Cost Analysis Plan as exceeding the cleanup goals specified in the document" Were cleanup goals firmly established and agreed upon?	The cleanup goal used for the EE/CA (27 pCi/g Ra-226, [USACE 1998b Table 5.1 Alt 4]) was derived based on input from the Ohio EPA and presented to the public in a public meeting. Comments resulting from this meeting were addressed. This will be

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			clarified in the text.
4	3.0 Remedial Investigation	" It was determined that radiological contamination did not pose a threat to groundwater at the site. However groundwater sampling was performed to document any impacts from radiological constituents to groundwater" The fact that sampling confirms that groundwater has not yet been impacted does not preclude it from future contamination. Therefore the groundwater exposure pathway should be included as an exposure pathway in the risk assessment.	The groundwater pathway was included in the subsistence farmer scenario. This will be clarified in the text. SESOIL modeling discussed in section 5 and confirmation by RESRAD indicate that there will be no radiological breakthrough for at least 1,000 years.
5	3.1.4 Groundwater Sampling	How does the sampling verify your SESOIL groundwater model? Does the SESOIL model predict breakthrough times for the radiological constituents? If so, What are they?	SESOIL does not predict breakthrough for longer than the timeframe of the SESOIL runs. The runs were set to 1,000 years. RESRAD Confirms the lack of breakthrough. A reference to the SESOIL discussion in section 5 will be added to the text.
6	6.65 Radiological Risk Summary	Although the Radon exposure pathway is typically excluded in development of derived concentration guidelines, has the risk from this radioactive gas been considered or	Soil concentrations of radium are not sufficient to cause a concern outside of a building. It is expected that any buildings built on the site would be constructed

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		estimated?	full knowledge of the remaining contamination.
7	TABLE 7.3	<p>Results of computer modeling were presented in Table 7.3 Remedial Action Objectives for the Painesville Site. Column 4 of the table presents concentrations of radiological constituents that alone correspond to the 25 mrem/yr.</p> <p>In effort to duplicate these numbers found in column 4 of the table. ODH used the RESRAD computer code to establish cleanup guidelines. While many of the concentrations (pci/g) were in close or approximate agreement for the Subsistence Farmer scenario, the concentration guidelines for both the Industrial Worker and Resident scenarios showed some disagreement.</p> <p>For the Subsistent Farmer scenario apriori agreed upon default and site specific parameters supplied in the report were used in the modeling. Some of the default inputs of the Industrial Worker and Resident scenario may require further discussion.</p>	<p>Table 6.9 includes input parameters for the RESRAD Runs. If RESRAD 6.2 is not used then the results may differ. A thorough check of the RESRAD Runs and the results will be done.</p> <p>The subsistence farmer inputs are consistent with the Luckey FUSRAP site. Version 6.2 of RESRAD was used for the final runs of industrial and residential scenarios.</p>
FEASIBILITY STUDY			
8	Section 2.3	I am not sure how the portion of 10CFR20	This standard is not relevant and

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	Table 2.1	Subpart D that establishes a limit of 100 mrem/yr Total Effective Dose Equivalent to individual members of the public apply here. Please elaborate on this requirement.	appropriate as a PRG or potential ARAR and will be removed from the table.
9	Section 3.1 Soil Volume Estimation	The 25 mrem dose limit established in 10CFR20 contains an ALARA proviso which should be included in this statement.	The ALARA provision of 10 CFR 20 is satisfied by the over excavation and constructability considerations given to the volumes. However, the ALARA provision will be included in the statement to help clarify this point.

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1	General RI	A RI is intended to fully identify the nature and full extent of contamination, yet the boundary of the RI's "study area" appeared to have been limited irregardless of information indicating that associated contamination may be located outside of the "boundary." CERCLA defines a "site" to be an area where waste was placed or has come to be placed: A "site" is not necessarily limited by legal boundaries or other geographical features. The rationale for limiting the scope of the FUSRAP investigation was not clearly defined as to why it was limited to geographical features. If there is limits to the FUSRAP program, then it should be made very clear in the revised RI/FS.	The boundaries of the FUSRAP site were determined through a review of the historical use of the site, and sampling of the site and natural migration pathways from the site. The results of these investigations indicate that FUSRAP contamination is limited to soils on the Painesville site proper, as indicated in the Remedial Investigation report
2	General RI	The risk assessment for this site should be conducted using a risk-based approach following CERCLA guidance per U.S. EPA OSWER Directive 9200.4-31 (December 1999). Overall, the process for assessing radionuclide exposures and radiation risks parallels the process for assessing risk from chemical exposure. Therefore, a risk-based approach rather than a dose-based approach should be used to assess risk from exposure to both radionuclides and	The Risk Assessment was done on a risk basis, Since the ARAR's for the site are dose based only those constituents exceeding risk base guidelines were translated into dose based clean-up goals. Radiological COCs were chosen as those radionuclides that exceeded "an estimated all-pathway radiological cancer risk of 1E-06" (according to the footnote to table 6.13.) The text has been modified to be more explicit in stating how COC's were

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		<p>chemicals. EPA does not recommend computing estimates of cancer risk from radionuclide exposures using the Dose-Conversion Factors (DCFs). This approach may tend to inaccurately estimate potential risks due to technical differences between the approaches.</p>	<p>identified.</p> <p>RESRAD calculates both dose and risk estimates. The cancer risk was not computed by using DCFs. RESRAD was used to calculate cancer risks. RESRAD calculates risk basically according to RAGS, i.e., determining an intake, and then multiplying this intake by EPA approved cancer slope factors (currently HEAST 2001 tables). RESRAD differs from RAGS in that an environmental fate and transport model, as well as radiological decay and ingrowth information, is built into the code, so that future intakes (over 1000 year evaluation period) may also be estimated. These factors (environmental fate and transport, and radioactive decay and ingrowth) impact the amount of intake of radionuclides that is calculated. However, once that intake is determined, as per RAGS guidance, the intake is multiplied by the appropriate cancer slope factor (radionuclide carcinogenicity slope factors – Federal Guidance Report No. 13. morbidity risk coefficients, as published in HEAST 2001 tables). No non-radiological chemical exposures were considered.</p>

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3	General RI	Outputs from the RESRAD computer program runs should be included in the appendix for review. Such information should include what pathways were evaluated and what pathways were "turned off" in the RESRAD code.	All pathways except the food, groundwater and Radon pathways are turned on for the industrial and residential scenarios. The groundwater and food pathways were turned on for the subsistence farmer scenario. The information about inputs and pathways is included in Table 6.9. The RESRAD outputs will be included as an Appendix.
4	General RI	The RGO's developed for this site should be compared to those developed for other FUSRAP and DOE sites in Ohio, such as with the Lucky Beryllium site. This would be useful information for the risk managers to evaluate during decision making.	We think that a more valuable comparison would be to compare input parameters for the dose/risk modeling at the two sites, which we have done, in an effort to obtain consistent modeling approaches, <i>when appropriate</i> , across all Ohio sites. Note that some of the inputs are site-specific (i.e., hydrogeologic parameters), and therefore, the resulting dose/risk would of course be different between the two sites. We believe that while it is important to maintain a consistent approach in our dose/risk assessments, that each site is unique, and cleanup numbers used at one site should not be used to justify similar cleanup goals at another site. (Please see the report, <i>Determining Cleanup Goals at Radioactive</i>

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			<p><i>Sites: Case Studies. April 2002, Interstate Technology and Regulatory Council, Radionuclides Team.</i> http://www.itrcweb.org/user/RAD-2.pdf</p>
5	General RI	<p>Soil concentrations and proposed cleanup levels should be evaluated against the Region 9 PRGs Soil Screening Levels for the migration of soil to groundwater, to determine if there's potential for contamination in soil to migrate to groundwater at levels that are not protective and unacceptable. This will help determine whether or not the proposed cleanup levels and any residual contamination remaining in the soils after remediation are within the acceptable levels and are protective.</p>	<p>THE SESOIL evaluation (section 5) as well as RESRAD runs were done to evaluate the potential for groundwater contamination. These evaluations are a step beyond the EPA radiological PRG screening since they use more site specific information. RESRAD also accounts for the potential migration of contaminants from soil to groundwater when developing the soil cleanup goals.</p>
6	Page 1, 1 st paragraph	<p>The text discusses the rationale for conducting a "focused" investigation on radionuclides that "were the responsibility of the AEC/MED." The definition of "responsibility" appears to be a major obstacle in completing a thorough investigation of the contamination. The property owner, Crompton, razed buildings, some of which included structures utilized for AEC/MED related purposes. Crompton</p>	<p>The areas in question will not be included in the current RI/FS. USACE Headquarters is currently preparing guidance policy regarding how the FUSRAP program will address properties where there is no current evidence that the Federal Government is a PRP. Final decisions regarding the areas in question will be made after that guidance is developed.</p>

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		<p>buried the resulting demolition debris on their property but outside of the "designated" FUSRAP boundary. Crompton asserts that the potential of radiological contamination being present on and/or within the structures was unbeknownst to them. Investigations conducted by both parties have found elevated levels of radioactivity outside of the Corps' FUSRAP "boundary." These areas included areas south of Fairport-Harbor Road in the Landfill 5 and Impoundment B (former pump house). Another potential area includes the area north of the railroad tracks that was never surveyed by the Corps to verify non-radiological contamination exists.</p> <p>Concurrent to the Corps' RI/FS, Crompton is obligated to complete a RI/FS for contamination stemming from past manufacturing work on the property. The contaminants of concern associated with their investigation are non-radiological in nature. The RI does not provide any justification for not investigating these areas.</p> <p>The responsibility for characterizing</p>	

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		radionuclides (the work may just verify that no radiological contamination exists) outside of the current FUSRAP area needs to be clarified. The areas need to be investigated similar to work undertaken by the Corps during its focused investigation. The results should be presented in the appropriate RI report.	
7	Section 2.1.2, Geology, page 4	The RI does not include any diagrams showing geologic cross-sections. This information should be included to provide a better understanding of the till units/aquitards present in the area.	The site investigated does not have significant variations in thickness of units that would justify the development of geologic cross sections.
8	Section 2.1.1, Topography, 1 st paragraph	The RI references that the Site occupies property owned by two separate companies. The RI does not provide a figure showing the location of the property line and extent of contamination on the same figure. The revised RI should include figures showing this information.	The fenceline will be added to figures showing the extent of contamination near the property boundary (Figures 3.3 and 3.4).
9	Section 2.1.3, Hydrogeology, page 5	The section fails to discuss ground water flow patterns nor provide figures showing flow direction. This information is needed to help determine proper monitoring well placement and fate and transport issues. The revised RI should include information on ground water flow.	Groundwater flow in the area of the site is extremely restricted since the till is an aquitard. The site is essentially flat and so no flow direction has been determined although it is presumed to be towards the Grand River. The perched water table is discussed in the 1998 Characterization report.

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10	Section 2.1.7, Ecology, page 7	The text states that the Site consists of two industrial complexes. It should be noted in the revised report the current conditions (i.e., building razed on Crompton property) of the properties/Site.	Although the buildings have been razed the floors and foundations are still in place and provide no additional ecological niches. This will be clarified in the text.
11	Section 2.2, Site History, page 9 ,2 nd paragraph, 2 nd sentence	The report states that sludge from the acid reaction was dumped onto waste beds. The report does not discuss the location, investigative findings nor potential impacts from the waste beds. The report should be revised to provide in-depth information on this potential source area.	No location of the waste beds was ever defined and none of the site wide screening showed areas other than those indicated in the reports to have been impacted. Text will be added to indicate that Records have been searched and all areas of the site investigated.
12	Section 3.2, Background Sampling, page 17	A table must be included which summarizes the analytical results from previous background sampling. This table should include, but is not limited to, the range of detections (i.e., minimum, maximum), distribution of data set, detection frequency for each analyte, and a statistical summary of the background data.	Table 3.5 is a summary of soil background from previous investigations. Other backgrounds are not included since those media are not discussed in this report. The table has been expanded to include Minimum, Maximum, average and frequency of detection.
13	Section 3.1.4, page 19, 1 st paragraph	The nearest monitoring well to Area A, the Butadiene Tank, is MW 16, which is potentially located cross-gradient to the location and plume as shown on Figure 3.8	Discussions held with Ohio EPA regarding the groundwater sampling indicated that the sampling of the pre-existing wells would provide the necessary information to

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		for Area A. If the well is cross-gradient, then the data is not representative. The revised report should clarify this issue, as well as an evaluation of the other monitoring wells/data relied on by the model. Additional monitoring wells should be installed if the network is found to be inadequate for the FUSRAP study or to support the SESOIL model	evaluate the groundwater impacts. Ohio EPA and Ohio Department of Health selected which wells were to be sampled. After reviewing the results Ohio EPA agreed that groundwater is not currently impacted.
14	Section 3.4.2, Background Statistics and Comparisons, page 20	Ohio EPA recommends defaulting to the maximum detected concentration for an individual constituent, if the calculated 95% UTL values exceeds the maximum concentration that was detected for that constituent in the background samples collected.	That procedure was followed. This will be clarified in the text.
15	Section 3.4.2, Background Statistics and Comparisons, page 21	Clarify what concentration was used for a specific analyte detected in on-site data to screen against the background value. Ohio EPA recommends using the maximum detected concentration of a specific analyte from on-site data to compare to the background value in order to determine if background was exceeded.	The individual sample concentration for each analyte was compared to background. This will be clarified in the text
16	Section 3.4.3.1, ARARs, page 24, paragraph 0	The Corps identified two regulations as applicable or relevant and appropriate requirements (ARARs) in the RI. The two ARARs rely on radiological dose-based	A remedy compliant with the NCP must either be compliant with the ARARs, or, if no ARARs exist, must achieve a risk within the USEPA risk range, but is not required to

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		<p>limits to determine protectiveness of human health. Dose-based limits are acceptable at sites under NRC jurisdiction and "non-agreement" states to which Ohio is not. To be consistent with the CERCLA process, the RI/FS must utilize risk based cleanup numbers, to demonstrate the protectiveness of any remedy will fall within the acceptable cumulative risk range established in the NCP of 10^{-4} - 10^{-6} (Ohio EPA consistently uses 10^{-5}). The RI/FS should be revised utilizing cumulative risk based standards to demonstrate protectiveness and during remedy evaluation.</p>	<p>meet both. Promulgated ARARs are presumed to be inherently protective of human health.</p>
17	Section 5.1, Secondary Sources, page 35, 3 rd paragraph	<p>The text states that the Government never owned the area south of Fairport Nursery Road (Road) nor conducted disposal activities there. There is uncertainty regarding potential radiological contamination in areas south of the Road. It is unclear if the acid pump station located in Crompton's Impoundment B on the south side of the Road was on property owned or operated on by DMC or the Government. The RI should be revised to provide detailed ownership records, including plot maps showing the property boundaries.</p>	<p>Figure 2.2 includes property ownership. Only the eastern portion of the area labeled as the FUSRAP site (east of a line slightly west of the butadiene tank) was owned by DMC. A new figure has been added showing the historic extent of the DMC property.</p>

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18	Section 5.2, page 36, 2 nd paragraph	The RI states that the listed secondary sources have been eliminated by evaluation of the results of characterization. This may be an accurate statement if the reference to other secondary sources is better defined. The text states, "may have included lagoons, landfills ..." The RI does not provide details on the location and subsequent investigation/characterization of any landfill nor lagoon. Comments contained herein recommend additional work or information on such potential areas of concern. The RI should be revised to clarify the statement made in this section.	A review of historical documents has not found any evidence of lagoons or landfills associated with past DMC operations. The reference to lagoons and landfills will be removed from this sentence.
19	Section 5.2, page 36, 2 nd paragraph	The RI states that secondary sources may include building surfaces and pipes used to transport acid waste. Crompton has reported that a former acid pump station and associated transport lines exist in areas of their property currently outside of the Corps' FUSRAP boundary, therefore, not subject to the FUSRAP program nor evaluated during this RI/FS. It is not clear how the Corps limited the FUSRAP boundary and/or material. Based on the referenced statement, the former acid	The acid sewers onsite and the outfall lagoon of the acid line south of the Grand River were previously evaluated. The 1998 report included the sediment and surface water samples from the acid sewers onsite. A separate investigation conducted by Ohio EPA and Ohio Department of Health into the Diamond Alkali lagoon on the south side of the Grand River concluded that there was no evidence of radiological contaminants.

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		<p>pump house and associated piping clearly should fall under the jurisdiction of the FUSRAP investigation and needs to be evaluated under this RI/FS.</p> <p>The assertion that building surfaces may be considered secondary sources of radiological contamination forces the issues of which party (i.e., Crompton, the U.S. Government, or both) is the responsible party for characterizing and, if necessary, conducting remedial action for radiological contamination that may be present in Landfill 5. The contamination would be a result of building surfaces contaminated through AEC/MEC actions later razed by Crompton and the resulting debris landfilled in Landfill 5.</p> <p>Because the radionuclides were introduced at this Site by actions of the U.S. Government, Ohio EPA considers the U.S. Government to be a PRP for radiological contamination on the Site. In the case of Landfill 5, Ohio EPA considers both entities as a potentially responsible party. If this is not the position of the Corps, that these areas are not to be addressed under this</p>	<p>Building surfaces were thoroughly scanned during the 1996 evaluations and only one surface was considered for evaluation by sampling. That sampling proved negative.</p> <p>See response to comment 6.</p>

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		action, then the RI should provide technical and possibly legal justification why this material is not subject to the FUSRAP investigation.	
20	Section 6.0, Baseline Risk Assessment, 2 nd paragraph	Add a discussion to explain how the RESRAD program (which is based on a dose approach) rather than a risk approach follows EPA RAGS guidance for evaluating CERCLA sites? This discussion should reflect and address some of the concerns discussed during past meetings with using risk versus dose approach, specifically, the evaluation of multiple exposures. In addition, this discussion can include a statement reflecting that RESRAD is the program used throughout the FUSRAP program.	<p>The following discussion will be added to the text: "Although cancer slope factors are defined differently for radiological and non-radiological constituents, in general, the RESRAD code uses the same equations as those listed in RAGS. Exceptions include units for constituent concentration (e.g., pCi/g instead of mg/kg), the addition of the external radiation pathway, and the exclusion of the dermal contact pathway. RESRAD also accounts for ingrowth and decay which RAGS does not do."</p> <p>The utilization of RESRAD to conduct radiological risk assessments under CERCLA is explained more thoroughly in our white paper, which we encourage Ohio EPA to read. This may be found at http://www.lrb.usace.army.mil/fusrap/docs/resrad-white-paper-2002-10.pdf</p> <p>RESRAD has consistently been used for FUSRAP and other former DOE site</p>

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			<p>evaluations because it calculates both dose and risk endpoints. Since several of the site ARARs are dose based, RESRAD provides the information needed to demonstrate compliance with these ARARs.</p>
21	Section 6.1, Methods Used for the Baseline Risk Assessment, last bullet	<p>Add "and risk based screening values" to the end of this sentence. U.S. EPA has developed a tool used for screening sites with radionuclide contamination called the Radionuclide PRG Calculator. These screening values are risk based PRGs, similar to those developed by U.S. EPA Region 9 for chemicals. These screening values can be found at: http://epa-prgs.ornl.gov/radionuclides</p>	<p>RESRAD does not automatically provide risk based screening values but can be used to calculate them.</p> <p>Radiological COPCs were chosen based on a screen against background, as well as a weight of evidence screen. USEPA PRGs for radionuclides are often below background, so including these additional levels as part of the screening process would most likely not have resulted in additional COPCs to be considered in our risk assessment. Please see also the response to Ohio EPA's comment #2.</p>
22	Section 6.1, Methods Used for the Baseline	<p>Remove "to provide" from this sentence ("to provide to provide"), since these words are repeated.</p>	<p>Yes, the words are repeated. This will be corrected.</p>

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	Risk Assessment, page 41, last sentence of last paragraph		
23	Section 6.1.1, Data Collection and Evaluation, page 42	Screening against background for the selection of COPCs, to evaluate in the risk assessment, should only be conducted for those constituents that are naturally occurring inorganic constituents. Anthropogenic background concentrations should only be used for discussion purposes in the uncertainty section. Clarify in the text of the second sentence of the second paragraph how background screening was conducted and information on background used in this evaluation. In addition, please add additional tables (similar to Table 3.5) to this report that presents the background concentration for naturally occurring constituents detected in other media than soil, such as "ambient air, surface water, sediment, land surface and building background, etc.)	The text will be clarified to indicate that only naturally occurring radionuclides were screened against background. Information on the comparison of background concentrations for naturally occurring constituents in other media was excluded because this investigation is focused on radionuclides in soil. The requested information is available in the cited characterization report.
24	Section 6.2, Identification of COPCs, page 42, 1st	Clarify whether or not the baseline risk assessment and selection of COPCs was limited to radionuclide constituents? The text is confusing and states that the BRA	For clarity the following text will be added to Section 1.1: "From the outset, FUSRAP authorization for

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	paragraph	<p>evaluated radionuclides associated with MED/AEC-related contamination. This implies that only radionuclide contamination resulted from MED/AEC activities. It is possible that contamination, other than radionuclide contamination, could have resulted from MED/AEC activities during magnesium processing. Documentation should be presented to support and justify the assumption that only radionuclide contamination could have resulted from MED/AEC activities. Review of Table 3.3 indicates soil was analyzed for VOCs, SVOCs, metals, mercury, PCBs, and pesticides. These constituents were detected in samples collected on-site, however, were not selected as COPCs and evaluated in the BRA. If these constituents are above risk based screening values and the screening criteria, then Ohio EPA recommends that these constituents be evaluated in the BRA, to evaluate the total exposure that a receptor would receive if there is exposure to both types of contaminants. This issue has been discussed at past meeting and a possible approach to address this comment would be to add text explaining that the FUSRAP</p>	<p>remedial activities at the Painesville site was limited to radiological contamination associated with MED/AEC activities. This contamination includes radionuclides from the uranium, thorium and actinium decay series. MED/AEC activities were not performed at the Painesville site. Radiological contamination detected at the site came from MED/AEC scrap materials brought to the site.</p> <p>These analyses were done so that proper disposal classification could be made of the soils that contained AEC/MED radionuclides. These constituents are not part of the AEC/MED legacy at this site.</p>

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		<p>program is mandated to address only radionuclides. Otherwise, justification is needed to support why they are not assessed, especially if a receptor is or will be exposed to both types of contaminants and the information/data is available.</p>	<p>Section 1.1 addresses the authorization of the USACE to address site contaminants.</p>
25	<p>Section 6.2, Identification of COPCS, 2nd paragraph</p>	<p>In the second sentence, add a sentence to explain what is involved with the weight of evidence approach that is used for selecting COPCS? Is this screening on basis of frequency of detect, etc.? Clarify in the third section that there are now risk based Region 9 PRGS specific to radionuclides that are available for screening and selecting COPCs. These can be found at: http://epa-prgs.ornl.gov/radionuclides</p>	<p>For clarity the following sentence will be added to Section 6.2.</p> <p>"Weight of evidence screening considered frequency of detection and screening based on secular equilibrium. Although risk-based PRGs are now available for radionuclides given the generally high risk levels posed by background levels of radionuclides from the uranium, and thorium series a background screen was considered to be more appropriate than a risk-based PRG</p>

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			screen."
26	Section 6.2.1, Initial Data Reduction, last bullet	Radionuclides with short half-lives and no parent radionuclide to support ingrowth may be considered for exclusion, however, careful consideration must be given to its initial and current activity, its half-life, decay products, and its parent, since radionuclide concentrations may change over time due to decay and ingrowth. Please address whether or not there were any short lived radionuclides that were present without the presence of the parent and how this was handled in the risk assessment process?	Since it has been 50 years since the AEC materials were brought to the site, no short-lived radionuclides associated with MED/AEC activities could be present without a parent. Therefore, short-lived decay products with no parent to support ingrowth were excluded from the risk assessment.
27	Section 6.2.1, Initial Data Reduction	Data should be evaluated to determine if the assumption of secular equilibrium is appropriate for this site. For instance, if radionuclides were processed for a particular isotope, then this isotope was removed from the decay chain and the assumption of secular equilibrium may not be appropriate. Provide documentation to support that this assumption of secular equilibrium is appropriate for this site, given that the site received waste containing radioactive material from other sites.	The materials sent to the site had not been processed for a particular isotope but rather for particular elements. They were the result of the initial stages of ore processing and would be similar to the current classification of "byproduct material". Uranium was chemically removed from the ore so the decay chain below uranium should be in secular equilibrium.
28	Section 6.3, Exposure	The referenced figure, Figure 6.1, as well as any of the Section 6 figures, are not	The requested figures will be added.

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	Assessment, page 45 2 nd paragraph	included in the RI report.	
29	Section 6.3.1, Characterization of Potentially Exposed Populations, 2 nd paragraph	Since this site is in a state of transition, it is reasonable to assume that a construction worker may be present at this site in the future. This receptor should be evaluated, along with the appropriate exposure pathways, in this risk assessment or include a statement regarding how exposure to this receptor would be accounted (either through the evaluation of the other receptors, such as resident) or how exposure would be managed if this type of exposure would occur.	A sentence will be added to clarify that although a construction worker may be exposed during site transition, this scenario was not be evaluated because this exposure scenario is expected to be less conservative than the scenarios that were evaluated including an industrial worker, a resident and a subsistence farmer. All three of these receptors are expected to have longer exposure durations than the construction worker receptor. This has been included in the text.
30	Section 6.3.2, Exposure Pathways, page 46	The RESRAD model appears to use data and exposure parameters that are inconsistent with exposure parameters discussed in the text of the RI (Table 6.9). The discrepancies should be corrected in the revised RI.	Calculations were correct but the values had changed and the table will be corrected.
31	Section 6.3.2, Identification of Exposure Pathways	a) Default U.S. EPA assumptions should be used for the industrial worker and resident receptors. Refer to OSWER Directive 9285.6-03, Human Health Evaluation Manual, Supplemental	a) Standard default assumptions were used whenever possible, however, no default guidance is provided regarding the amount of time an industrial worker spends indoors. The assumption that seven hours of each

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		<p>Guidance: Standard Default Exposure Assumptions (1991) and Exposure Factors Handbook (1997) for guidance. In general, it is assumed that industrial workers are exposed to contaminants for eight hours per day and that this exposure time is not partitioned between time spent indoors versus time spent outdoors. However, site-specific considerations are taken into account when developing exposure assumption, therefore, documentation is needed to support the assumption that industrial workers spend seven hours indoors and one hour outdoors, if this is based on site-specific considerations. b) A construction worker receptor can potentially be exposed to shallow groundwater during excavation and grading activities and the installation of utility lines. Therefore, this exposure pathway should be evaluated in the risk assessment. c) Please present the associated risk estimates and hazard index estimates separately for the adult and child resident receptor and farmer.</p>	<p>work day would be spent indoors was based on the assumption that the site would be a developed industrial facility. Since the site is located in northern Ohio it is expected that facilities would be constructed to keep workers out of the weather since weather conditions would limit worker productivity. This is consistent with the Exposure Factors Handbook (1997) recommendation that the typical adult (ages 12 and older) spends 21 hours/day indoors and 1.5 hours outdoors. The assumption of 7 hours indoors and 1 out is also more conservative than assuming 8 hours indoors.</p> <p>b) The construction worker scenario was not evaluated due to the short exposure duration anticipated for this receptor. Although a construction worker may be exposed to wet soils workers are not expected to work on utility lines in standing water without proper protection.</p> <p>c) The ARAR for dose-dependent cleanup levels does not specify that a child receptor should be used. RESRAD defaults, which were established for an adult, will be used</p>

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			to characterize subsistence farmer risks.
32	Section 6.3.3, Quantification of Exposure Concentration and Pathway Specific Intakes	Clarify how results reported as non-detected for an individual constituent were used to calculate the EPC.	The second sentence in Section 6.3.3 states that for all calculations non-detect data was replaced with ½ the detection limit.
33	Section 6.4, Toxicity Assessment	a) Cancer slope factors and non-cancer reference dose toxicity information and dose conversion factors must be summarized and presented as a table in this report. This table should identify the COPC, the toxicity value listed by specific exposure pathway, the source of the information, and the date when these sources were reviewed. b) Ohio EPA assumes that excess cancer risks are additive for purposes of evaluating the total cumulative risk and hazard index estimates for a receptor that is exposed to a contaminated area. While it is true that the assessment can be conducted separately, the excess cancer risk estimates, due to exposure to both radionuclides and chemical carcinogens, should be summed to provide an estimate of the combined risk to that receptor, due to all carcinogenic	The authorization for this investigation does not include an evaluation of chemical risk for constituents other than radionuclides. a) All risk/dose calculations (except for uranium toxicity) were done using the latest version of RESRAD which uses HEAST values that were updated in April 2001.. Uranium toxicity calculations are shown in Table 6.10-6.12. A footnote will be added to these tables to provide the non-cancer reference dose and a citation for the value used. b) No chemical carcinogens were evaluated in this risk assessment. In order to quantify the potential for kidney damage caused by exposure to uranyl salts, uranium was evaluated as both a radionuclide and a chemical

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		contaminants as specified in OSWER Directive 9200.4-18 (U.S. EPA 1997).	
34	Section 6.5, Risk Characterization, page 48 a) [first paragraph]	Provide a reference for guidance that allows for the contribution from background to be excluded from consideration in a risk assessment. Per Ohio EPA, the risk assessment and characterization for CERCLA sites should follow the approach outlined in U.S. EPA (1989) Risk Assessment Guidance for Superfund, Volume I Human Health Evaluation Manual, Part A.	The proposed ARAR does not include background when developing cleanup levels so in the risk assessment we subtracted background to be consistent with the ARAR. This approach is consistent with what was done on the Luckey Site.
35	Section 6.6.6, Remedial Action Objectives, 3 rd paragraph	The reference to ARARs being identified at a later date should be corrected to reference the appropriate section of the FS, since the FS has been completed.	The requested correction will be made.
36	Section 6.6.6, Remedial Action Objectives, 3 rd paragraph	EPA concluded that to be considered protective under CERCLA, remedial actions should generally attain dose levels of no more than 15 mrem/yr EDE for those sites at which a dose assessment is conducted. This dose level corresponds to an excess lifetime cancer risk of approximately 3×10^{-4} . Ohio EPA has stated that 10^{-5} is the acceptable risk level for cumulative exposures for unrestricted reuse. EPA reviewed the dose limits that	See response to comment 16. The 15 mrem/yr guidance is not a promulgated ARAR.

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		<p>are contained in the NRC's Radiological Criteria for License Termination (see 62 FR 39058 July 21 1997). The NRC rule allows a cleanup level of 25 mrem/year EDE with exemptions allowing cleanup levels of up to 100 mrem/year. These levels are equivalent to approximately 5E-4 to 2E-3, respectively. These levels are beyond the upperbound of the risk range for making risk management decisions at CERCLA sites. This determination is consistent with EPA's explicit rejection of a risk level of 5.7E-4 for elemental phosphorus plants (54 FR 51670).</p>	
37	Section 6.7.3, Screening Soil Invertebrates	Ohio EPA recommends a soil zone of compliance of 0 - 4 feet (instead of 0 - 2 feet) to assess exposure for burrowing terrestrial receptors.	The use of a larger zone would dilute the EPC. The use of the 0-2 zone is considered to be conservative since the contaminants are concentrated in this zone.
38	Section 7.2.1, AEC Related COCs	See comment above regarding 25 mrem/year vs. 15 mrem/year.	See response to 36.
39	Section 7.2.2, Recommended Remedial Action Objectives	See comment above regarding 25 mrem/year vs. 15 mrem/year. This would be useful information for the risk managers to evaluate during decision making. Also, soil concentrations and proposed cleanup levels should be evaluated for the potential of contamination in soil to migrate to	<p>See response to comment 36 regarding 15 mrem/yr.</p> <p>See response to comment 5 regarding groundwater.</p> <p>See response to comment 4 regarding</p>

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		groundwater at levels that are unacceptable, in order to determine whether or not the proposed cleanup levels and any residual contamination remaining in the soils within the acceptable levels. The RGO's developed for this site should be compared to those developed for other FUSRAP and DOE sites in Ohio, such as with the Lucky Beryllium site.	comparison of cleanup levels to other sites.
40	Section 7.2.3, page 61	The text states that the RI adequately determined the nature and extent of FUSRAP-related contamination and provides an evaluation of the potential impacts to human health and the environment. Based on the comments/issues raised in the previous comments, Ohio EPA does not agree that a complete characterization of FUSRAP-related contamination has been conducted. Additional work is necessary to fulfill the data needs of the RI. The determination of potential impacts to human health should be performed consistent with the CERCLA processes.	USACE believes that FUSRAP contamination on the Painesville Site has been adequately delineated. Historical records reviews, computer modeling, and sampling of the site and the natural migration pathways from the site have indicated that FUSRAP contamination is confined to site soils. Also, see responses to comments 1 and 6.
41	Section 7.2.3, Recommendations for Future Work	Please include a statement in the FS providing the rationale for completing the FS (e.g., risk is greater than acceptable risk range).	The 4 th and 5 th paragraph of Section 1.0 of the FS states contain the requested language.

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42	Table 6.15	The Table should contain an evaluation for the Industrial Worker's exposure to radionuclides in the subsurface soil (e.g., pipe worker).	Table 6.15 presents remedial action objectives for the 3 receptors identified and characterized by the risk assessment. Both the resident and the subsistence level farmer were assumed to be exposed to total (surface and subsurface) soil. The industrial worker is not assumed to take part in construction activities so his exposure is limited to surface soil. Justification for exclusion of the construction worker scenario was provided in the response to comment 29.
FEASIBILITY STUDY			
43	General	The Corps is aware that the property owner is undergoing a Site-wide RI/FS. Any remedial actions proposed by the Corp for the FUSRAP material should be consistent with the Site-wide anticipated remedy(s). The parties should work together to understand and develop appropriate remedies that work in harmony and will not jeopardize, destroy or otherwise alter the protectiveness of any existing or anticipated remedy	USACE will continue to work with the site property owner during the remedial action process.
44	General	The FS evaluates several remedial options that require long-term operations and maintenance and possibly deed-	If a restricted-release remedial alternative, which requires land use controls, is selected, USACE will strive to work with the

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		<p>restrictions. The property owner has gone on record of not accepting any but a "free-release" standard for radiological contamination on their property. Since the property is not owned or operated by representatives of the U.S. Government, it is not clear how these actions will be implemented. In order to fully evaluate the options present in the FS, the FS should include discussion on the "administrative" procedures that will allow the proposed remedies to meet the NCP's nine evaluation criteria</p>	<p>site property owner to implement the necessary controls. However, the Federal Government does have the authority to condemn the property in order to gain the necessary property rights to implement land use controls. This will be added to the text of the report.</p>
45	Executive Summary, page vii, 7 th paragraph:	<p>The text references PRGs, yet in the preceding RI Section 7.2.2 (page 61), the RI states that PRGs have been replaced with site-specific radiological action levels. The discrepancy should be corrected.</p>	<p>The sentence has been replaced by the following "Impacted soil exceeding remedial action objectives would be covered in-place by a one-foot thick asphalt cap"</p>
46	Section 1.0, page 1, 3 rd paragraph	<p>The text references that changed site conditions have occasioned the Focused RI/FS. The text should clarify, in specific detail, what has "occasioned" at the Site and the extent of impact to the RI/FS and what has been done to adjust to the changes</p>	<p>Paragraph 3 of the section indicates the changes that occurred. Namely the cessation of operations and the transfer of the property.</p>
47	Section 1.0, page 1, 4 th paragraph, last	<p>The text references that unacceptable levels of COCs are not present in certain media. The term "unacceptable" is</p>	<p>This is an introductory paragraph, the details are provided in the RI and later in the FS. The following has been added to</p>

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	sentence	ambiguous. The text should be revised to include what evaluation criteria is being used to determine unacceptable (e.g., risk range.)	the paragraph "This is based on the findings, of the 1996 characterization, that no radiological contamination was found in sediment or surface water above background and, the 2000 sampling, that all radionuclides in groundwater are well below MCLs."
48	Section 1.0, page 2, 1 st sentence	The text should be revised to include the phrase "and the NCP" at the end of the sentence.	Will revise the sentence as follows: 'The two threshold-NCP criteria are that an alternative must be protective of human health and the environment, and that it must comply with the ARARs"
49	Section 2.0, page 3, 1 st paragraph	The text states that PRGs are initially based on chemical-specific ARARs. The PRGs should also be based on location-specific ARARs and to the extent information is available, action specific ARARs. The text should be revised and additional discussion in the FS should be added, as appropriate.	USACE looked for location or action specific ARARs for radionuclides, and did not find any. This will be clarified in the text.
50	Section 2.1, Remedial Action Objectives (RAO), page 3	The FS fails to include a bullet for meeting ARARs as part of the RAO process. This is a critical element of the RAOs. If a potential action will not comply with ARARs, then it should not be an objective for cleanup. In addition, it is not clear if the bulleted list maintains removal as an	ARAR's are presumed to be the criteria by which protection of human health and the environment are evaluated. A bullet will be added indicating that one RAO is to Comply with ARARs. Removal is not an RAO, it may be an alternative.

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		objective. Removal is a viable action that will achieve protectiveness, but its "up-front" cost will be higher. The FS should evaluate the RAOs to ensure their accuracy and provide all cleanup objectives.	
51	Section 2.2.2, Identification of ARARs, page 5:	It would be beneficial if the FS included a list of all potential regulations and the technical justification for determining which ones are considered an ARAR.	Table 2.1 provides a list.
52	Section 2.2.2.1, page 6 3 rd paragraph	The text identifies three radionuclides as the substances to be address by the RI/FS. The text should be revised to include the associated decay products.	<p>The associated decay products were considered in the RI and are included in the calculation of Dose. This will be clarified in the text.</p> <p>When uranium 238 is entered into RESRAD, then RESRAD automatically considers uranium 234, thorium 230, radium 226, and lead 210 in the dose and risk calculations. Output dose and risk can then be examined per individual nuclide, or per initially existent nuclide (the latter includes the decay chain). Similarly, entering uranium 235 into RESRAD will allow for automatic consideration of its decay chain, i.e., actinium 231 and protactinium 227. Entering radium 226 will result in lead 210 also being considered. Entering thorium</p>

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			<p>230 will result in radium 226 and lead 210 automatically being considered. This automatic consideration of the decay chain is one reason why RESRAD is so convenient to use, and why we have chosen to use it in calculating risk and dose at FUSRAP sites. The dose-to-source and risk-to-source ratios that were taken from the RESRAD runs to determine site risk and dose based RAO's were those based on initially existent radionuclide (i.e., including the decay chain).</p>
53	Section 3.0, General Response Actions, page 8, bulleted list	The FS should add another bulleted general response action that was not evaluated under the FS. The response action should include consolidation. Consolidation of radiological contaminated soil may be a viable option that needs to be evaluated in conjunction with removal and capping	Consolidation of contaminated soils onsite was eliminated from consideration based on conversations with Ohio EPA during the early phases of the project.
54	Section 6.2, Alternative 2, page 32, Figure 5.2, page 30	The use of asphalt caps as part of this potential remedial action. It is unclear and unsupported why the use of clay, multilayer, or native soil caps were eliminated from the detailed screening process. The use of asphalt as the	As is discussed in the text the asphalt cap is a representative technology for capping in general.

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		capping material may not be conducive to long-term permanence and use. The other capping alternatives should not have been screened out, since they appear to have the same advantages and disadvantages as asphalt and should be included in the evaluation process.	
55	Section 7.0, page 34	The section provides alternative arrays for Areas A, B, C, D, and G but does not provide details on Area E, F, G, H or I. It is unclear why alternatives information was not presented for these Areas. The FS should be revised to provide the required information for all areas of concern.	Areas E, F and H were investigated and found to be free of FUSRAP contamination. Area I is located within Crompton's Landfill 3, and as stated in the response to comment 6, the Federal Government will not make a final determination regarding any actions regarding it until further guidance is received. Therefore Area I will not be addressed as part of this FS.
56	Section 7.2, Alternative 7.2, page 36, Capping and Figure 7.1, page 37	The heading and discussion in this section references soil capping, yet in Section 6.2 soil caps were screened out. The Figure under Alternative 2 references soil cap. It is unclear if the evaluation is for a soil or an asphalt cap. The FS needs to be revised to consistently use and evaluate viable remedial options	The reference is to capping of soil not to a soil based cap material. The title of the section will be revised.
57	Section 8.3, page 46, Long-Term Effectiveness	The FS acknowledges that without land-use controls and long-term maintenance that certain alternatives would not be protective. It is Ohio EPA's understanding	See the response to comment 44.

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		that no mechanism or agreement-in-principal exists between the Corps and the property owner regarding land-use controls/deed restrictions. Absent the ability to implement a deed restriction or land-use control, then these alternatives should be screened out of the remedial process based on the failure to meet several of the NCP's assessment criteria.	
58	Section 8.7, page 48, Cost	It is unclear if the cost comparison for each alternative includes Operation and Maintenance (O & M) costs. Given the length of time that O & M would be needed, the associated costs will need to be factored into the evaluation process. The FS should be revised to include O & M costs for each alternative.	O&M costs are included for each alternative. See Appendix H for complete cost estimates.
59	Figure 6.1	It is unclear how the SOR for the industrial worker can extend beyond the SOR for the subsistence farmer (northern portion of Area A) or, in other areas, almost share the same boundary. The FS should be revised to clarify and explain the information presented in the figures.	Due to a low density of samples it is possible for the projection algorithm to adjust the boundaries. The figures will be revised.