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APR 27 1998

DOE-0707-98

Mr. James Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

DRAFT RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE AREA 1, PHASE I CERTIFICATION REPORT

This letter transmits the Draft Responses to U. S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) comments on the Area 1, Phase I Certification Report, July 1997. As per our discussions, a meeting will be held on May 12, 1998 to discuss these draft responses. The final responses will be transmitted as an attachment to the Revised Area 1, Phase I Certification Report, May 1998. The revised report and final responses will be transmitted on or before May 28, 1998.

If you have any questions, please contact Robert J. Janke at (513) 648-3124.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:R.J. Janke

Enclosures: As Stated

Recycled and Recyclable

cc w/enc:

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RESPONSES TO US EPA COMMENTS ON AREA 1, PHASE I CERTIFICATION REPORT FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Not Applicable (NA) Page #: NA Line #: NA
Original General Comment #: 1

Comment: The certification report concludes that analytical results for most of the tested certification units (CU) are within the limits specified as final remediation levels (FRL). The only exception to this conclusion involves discrepancies between the results of the thorium-232 analyses by alpha spectrometry and those by gamma spectrometry, which are discussed in more detail in Original Specific Comment 2. Analytical results for eight CUs are greater than the FRL by gamma spectrometry but less than the FRL by alpha spectrometry. Acceptance of these results as being within the FRLs should be deferred until this alpha and gamma spectrometry methodological issue is resolved in the letter report discussed on Line 4 of Page 4-3.

Response: Agreed. The draft A1PI Certification Report acknowledged the discrepancy between the alpha spectrometry and gamma spectrometry results and proposed the submittal of a letter report to EPA to clarify and resolve the discrepancies. Since the submittal of the A1PI Certification Report on July 1, 1997 to the EPA, a much better understanding as to the reasons for the discrepancies has been gained. Furthermore, through the Real-Time Work Group Meetings numerous discussions between FEMP representatives and representatives from the U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA) have occurred on the methodology for performing gamma spectrometry to better standardize the spectrometry process and more accurately determine thorium-232 concentrations. These discussions have lead to a much better understanding as to the reasons for the discrepancies as well as the path forward to help prevent or eliminate such discrepancies in the future. The discussion below provides the reasons for the discrepancies and the steps or procedures which have been put in place to resolve the discrepancies in the future. This discussion is being provided in the response to comment instead of the white paper which had been committed to in the draft certification report.

The alpha and gamma spectrometry discrepancy issue in the A1PI Certification Report resulted because the alpha spectrometry results for thorium-232 were, on average, statistically lower than their corresponding gamma spectrometry results. As a result, in some of the certification units (CUs) this statistically significant difference was sufficient to result in some of the CUs failing certification by gamma spectrometry but not by alpha spectrometry. These thorium-232-based analytical discrepancies occurred in a total of eight certification units: (1) Q18-40, (2) Q19-10, (3) P18-40, (4) P20-30, (5) P17-22, (6) P17-32, (7) O19, and (8) O20. As a result of the discussions with the EPA and the evaluation of the A1PI certification results, which were showing conflicting results (alpha versus gamma discrepancies, gamma spectrometry results higher than alpha spectrometry results; and inter-laboratory variability and bias between gamma spectrometry results), the EPA agreed to the DOE's recommendation to only report the alpha spectrometry results in the A1PI Certification Report.

The factors which caused the alpha versus gamma discrepancies are as follows:

(1) The analysis of A1PI certification samples via two different analytical methods: alpha spectrometry and gamma spectrometry. Different analytical methods will, even under the best circumstances, produce different results.

(2) The laboratory analyses of the A1PI certification samples were conducted at three different off-site laboratories (EPI, Acculabs, and Thermo-Nutech or TNU). Confirmatory analyses were also performed at the FEMP laboratory. Given the same analytical method and procedure, different laboratories will often achieve different results.

(3) The small relative difference between the final remediation level (FRL) in soil and the FEMP background concentration for thorium-232 in soil. The FRL is 1.5 picocuries (pCi) per gram of soil; while, the 95th percentile of the background concentration for thorium-232 at the FEMP is 1.36.

(4) An analytical bias and lack of standardization in the gamma spectrometry method used to determine the thorium-232 concentrations. Each of the A1PI certification laboratories (outlined in item one above) utilized a biased and different method of evaluating the spectra and determining the thorium-232 concentrations.

Each of the factors above contributed in varying degrees to the observed alpha versus gamma discrepancies. However, the completion of the certification results from Area 1, Phase II (A1PII) indicate that the primary contributor to these discrepancies (which lead to the false failure of the eight CUs in A1PI by gamma spectrometry) was due to an analytical bias and a high variability in the gamma spectrometry methodology. The high variability resulted from a lack of standardization in the gamma spectrometry methodology among the three commercial laboratories. Through the Real-Time Work Group discussions, a refined gamma spectrometry methodology for thorium-232 was established which standardized the process that the commercial laboratories would be required to follow. Through these Real-Time Work Group Meetings, it was established that the preferred thorium-232 gamma spectrometry analysis procedure should consist of using four energy lines, namely those from actinium-228, thallium-208, and lead-212, and performing an error-weighted analysis to determine the thorium-232 concentration (described in the DOE Letter, from Johnny Reising to James Saric and Tom Schneider, dated November 20, 1997).

The lack of standardization in the gamma spectrometry methodology created an inter-laboratory variability with respect to gamma spectrometry. The inter-laboratory variability was due to each laboratory selecting a different photon energy peak from the thorium-232 daughter products to measure the thorium-232 concentration (sometimes only one photon peak was utilized other times multiple peaks were used). Along with the variability, in some cases a high gamma spectrometry bias was also introduced. From reviewing the A1PI certification results, the FEMP was able to determine that the high gamma spectrometry bias was partially due to the spectrometrist using only a single gamma energy line to determine the concentration of thorium-232 (there is a significant difference between using a error weighted average and using a single gamma photon energy because an error weighted approach reduces variability). Recognize that this created a high relative bias between gamma spectrometry analyses. Separate and additional variability and bias

can result between the comparison of gamma spectrometry and alpha spectrometry. In general, alpha spectrometry tends to produce lower values than gamma spectrometry.

Action: In order to help ensure that similar discrepancies do not occur in the future, the FEMP has instituted the following actions:

(1) Utilize a single analytical procedure for determining thorium-232 concentrations that are to be used in making certification decisions. As stated in the draft final Sitewide Excavation Plan (April 1998), the preferred thorium-232 analytical approach is gamma spectrometry coupled with a standardization of the thorium-232 spectrometry methodology using the EPA approved spectrometry approach.

(2) Develop and routinely use a FEMP reference standard to reduce the variability in the analytical data. A large volume of FEMP soils was obtained, homogenized, and is in the process of being characterized and certified by DOE's Environmental Measurements Laboratory (DOE-EML) for use as a check standard. Once the DOE-EML's certification procedure is complete aliquots of the standard will be sent to commercial laboratories under contract by the FEMP for use as a check quality control standard to determine the acceptability of analytical certification data. The tight control limits developed for these DOE-EML "certified" soils will be required to be met by any commercial laboratory performing the certification analyses. The routine use of the check standard should help to reduce analytical variability.

(3) The alpha spectrometry data will be utilized for certification determination in the A1PI Certification Report as previously submitted and the corresponding gamma spectrometry results will be included in Appendix B for reference. The commitment for the white paper report regarding the alpha/gamma spectrometry issue will be removed from the A1PI Certification Report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: NA Line #: NA
Original General Comment #: 2
Comment: The report provides certification data for 78 separate CUs. The report should contain one figure showing all of Area 1 and the CU layout. Moreover, the report should contain figures showing CU configuration changes over the course of the Area 1 Phase 1 (A1PI) project and figures illustrating changes in CU data point locations.

Response: Figures 2-2, 2-3, and 2-4 in the A1PI Certification Report present the locations and dimensions of the Radiological CUs, Metal (inorganic) CUs and PCB CUs respectively. Due to the discrepant dimensions of the CUs for the three ASCOC suites in A1PI, overlying all of the CUs on a single map is confusing and results in a figure that is not useful.

Changes within CUs were made for reasons specified in Table 2-4 in the A1PI Certification Report. The configuration of these CUs were changed "from" the original CU maps that appeared in the Area 1, Phase I Work Plan submitted in November of 1996. In this original A1PI CU map the CUs were assigned as rectangular "blocks" based on spatial analysis of the existing data and production knowledge only. This initial configuration did not consider engineering limits, stockpiles, and other physical restrictions that were incorporated by necessity later. The "before" maps of the analytical suite CU boundaries

are presented in a map included in the A1PI Workplan. Figures that show interim CU and data point locations changes do not exist. The maps of final CU dimensions and configurations (i.e., Figures 2-2, 2-3, and 2-4) are presented in the A1PI Certification Report. The final locations for each CU are shown in the CU maps included in Appendix A. The changes made to the CU design are detailed in Table 2-4 in the A1PI Certification Report.

Action: Original maps of all three suites of CUs including radiological, inorganic (metals), and PCBs from the Area 1, Phase I Work Plan will be included in the revised report. Comparison can then be made to the current Area 1, Phase I CU maps included in the Area 1, Phase I Certification Report. The descriptions of changes made and the reasoning for those changes included in Table 2-4 will be revised with any additional available information.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: All Line #: Total Uranium
Original General Comment #: 3
Comment: The total uranium data provided in the tables have been rounded to tenths for all data sets in Appendix A. For example, the summary table for CU P17-22 states that the concentration of total uranium detected in sample P17-22C2-R-1-D is 5.8 micrograms per gram (μg/g). This value was rounded up; the actual value is 5.75 μg/g. The data provided in the tables for the other primary area-specific constituents of concern (ASCOC) have not been rounded. The data sets should be consistently presented. Therefore, the data tables should be revised to include all un-rounded values.

Response: Uranium values were rounded because many of the total uranium values in the SED are calculated from isotopic values and have excessive decimal places. Numbers in the presentation tables are presented only for demonstration purposes and were rounded to comply with the significant figures needed for comparison to the FRL. The values were carried to at least one significant figure beyond the requirements of the FRL. In the statistics spreadsheet the full values are retained and calculations were performed with those values. DOE feels the manner the data is presented in the Area 1, Phase I Certification Report is sufficient for the purposes intended. There was no intent for utilization of the data contained in these tables to duplicate the statistical calculations.

Action: The original data used in the statistical calculations can be provided in the form of an electronic spreadsheet on request.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A-C Page #: All Line #: All
Original General Comment #: 4
Comment: The tables appear to have numerous errors, including missing data, incorrect values (0.01 to 0.3 concentration variations from the correct values), and unsupported data. The missing data include a value for total uranium in sample O20HS-1-R-13 (see Original Specific Comment 20). Incorrect data entries were noted in Appendix A in the data tables for the primary ASCOCs (see Original Specific Comment 21). The unsupported data include the data summaries for cesium-137 and thorium-230 (see Original Specific Comment 18). The data tables should be checked and revised to report all data accurately.

Response: Comment acknowledged. Tables were edited for accuracy. The following errors were found; For radiological parameters, analytical results are usually entered to three decimal places (0.000). The displayed result in Appendices A and B is to two places (0.00). In instances where the third decimal is a 5, Appendix A truncated the number and Appendix B rounded the number, which explains many of the noted discrepancies in the Appendices. For statistical calculations the entire number was used so statistics are unaffected.

Action: Tables found to be in error were corrected and reprinted, including the O20 hot spot data. Data that was missing from tables including data representing the secondary radiological ASCOCs cesium-137 and thorium-230 were added to Appendix B.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix F Page #: All Line #: NA
Original General Comment #: 5
Comment: Appendix F contains on-site disposal cell sediment basin certification results. However, no data summary tables, figures, or other supporting documentation is provided for these results. Supporting documentation such as data summary tables or figures should be provided.

Response: Agreed. The five OSDF sediment basin CUs were subjected to characterization for reuse for the purpose of establishing the ability to reuse soil excavated below a certified depth during construction for "clean fill". These soils were used as the primary source of the clay materials used to line basins in A2PI. Final remediation and certification of this sediment basin will take place after the basin is no longer needed to support OSDF construction.

Action: In the revised A1PI Certification Report, Appendix F will be deleted; however, tables and figures will be developed presenting the certification analytical results from the OSDF Sediment Basins in the same manner as the other Area 1, Phase I Certification Units.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3 Page #: Table 3-1 Line #: NA
Original Specific Comment #: 1
Comment: The text states that "the volumes for the A1PI sediment traps do not include soil in the berms." It is important to document the source of the soil used to construct the berms in order to reduce the potential for recontamination of the area. A figure should be provided to show the locations of the berms, and the text should be revised to identify the source of the soil used to construct the berms.

Response: There are three sediment traps located within A1PI. They are referred to as A1PIST-1, A1PIST-2, and A1PIST-3. The material that was used to construct the berms for all three originated from the excavation of the sediment traps prior to remedial excavation and certification. Sediment trap CU A1P1ST-1 was certified in-place, in order to reduce impact to the OSDF construction schedule. The berm materials in A1PIST-1 were considered to be impacted. Certification sampling and analysis testing was conducted on the native soils beneath the berm materials for all ASCOCs. The results passed certification analysis and the analytical results are included in the A1PI Certification

Report. A1PIST-1 was excavated during construction of OSDF Cell 1. The berm materials were placed in the East Impacted Material Stockpile.

As part of the work scope of Area 1, Phase II, the remaining two sediment trap CUs A1PIST-2, and A1PIST-3 (including the berm materials) will be sampled for certification. Following certification, the sediment traps will be graded for wetland mitigation.

Action: A description of the origins of the berm material will be incorporated into the text, and a figure showing exact locations of the sediment trap berms will be provided. Prior to certification sampling and analysis, a certification design letter (CDL) for A1P1ST-2 and A1P1ST-3 will be submitted to the regulatory agencies for review and approval. A separate design package for the grading and restoration of these two sediment traps will be issued to the regulatory agencies for review and approval as part of the wetland mitigation effort.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-3 Line #: 14
Original Specific Comment #: 2
Comment: The text indicates that the results for thorium-232 analyses of the certification samples by gamma spectrometry generally exceed the alpha spectrometry results for the same radionuclide in the same samples. This difference in analytical results can affect the decision as to whether certain CUs exceed the FRL for thorium-232. The proposed use of soil-specific radiological standards as calibration standards or check standards will be useful in addressing this problem. However, one useful principle is not discussed in the text, namely not making unnecessary assumptions. In this context, the analytical method involving fewer calculations and underlying assumptions with regard to the raw counting data and the final (reported) activity result would be the better method unless compelling reasons exist to accept the additional complications of the alternate method. This principle should be considered in resolving the methodological discrepancy.

Response: Please see response to Original General Comment 1.

Action: Please see action to Original General Comment 1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.3.4 Page #: 5-4 Line #: 33
Original Specific Comment #: 3
Comment: The text states that "the 0-6 inch interval across the entire P17-32 CU was excavated." However, Figure 5-8 does not support this statement. According to the pre-excavation and post-excavation elevations presented in the figure, several data points indicate that less than 6 inches of soil was removed, which is not acceptable. The text should be revised to address this issue.

Response: CU P17-32 failed after initial excavation for arsenic contamination on initial certification sampling and analysis. As a corrective action "in situ" certification samples at several intervals were obtained with the Geoprobe at specified depths and analyzed for arsenic. The 6 to 12-inch increment was found to be below the arsenic FRL and the commitment was made to remove 6 inches (assuming top down contamination) to achieve certification with no further sampling. Figure 5-8 included in the document contained pre and

post-excavation elevations that did not support the removal of 6 inches of soil at all locations in the CU, without further explanation.

Calculations of removed soil volume were conducted using the data presented in Figure 5-8. Differences between pre- and post-excavation survey elevations were summed and averaged. The average soil depth removed across the CU was calculated at .869 feet compared to the commitment of .5 feet. If .5 feet (6 inches) was excavated from across the CU approximately 394 cubic yards of soil would be generated. Approximately 704 cubic yards were actually generated in the excavation process (based on the .869 feet average excavation depth). In summary, the commitment to remove 6 inches of soil across CU P17-32 was exceeded by approximately 70 percent. However, post-excavation regrading resulted in the failure to demonstrate 6 inches removal at several surveyed node points.

Action: Text will be added to describe Figure 5-8 and the corrective action performed in CU P17-32 in more detail.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.3.5 Page #: 5-5 Line #: 19
Original Specific Comment #: 4
Comment: The text discusses an original certification sample collected in CU O20 that exceeded the "2 x FRL" criterion for radium-228 (indicating a "hot spot"). This sample was collected from the northernmost border of the Fernald Environmental Management Project (FEMP). The extent of radium-228 contamination has not been defined to the north of this location. The text should be revised to present plans to properly delineate the extent of radium-228 contamination to the north of CU O20.

Response: The basis of the comment is erroneous. There were two separate issues in CU O20. The first was a "hot spot" failure for total uranium. One of the certification samples (certification Sample Number 8 on the northwest boundary) came back at 205 ppm for total uranium. The FRL for total uranium is 82 ppm in this area so this sample point was considered a "hot spot" by the criteria of x2 the FRL. A corrective action plan was carried out and this total uranium hot spot was successfully removed. Removal of the total uranium hot spot was bounded with a sample point to the north. Details of this removal and associated data are provided in the report in Section 5.3.5, Page 5-5.

An FRL failure for radium 228 was also noted in CU O20 based on the original certification data. There was no hot spot for radium 228 because no single sample exceeded x2 the FRL of 1.8 pCi/g. The highest single value was 2.46 pCi/g. The CU failed the certification criteria for radium 228 due to the high data variability for this ASCOC. It was agreed to that seven additional random samples should be obtained to supplement the existing 12 samples. This was performed and the UCL on the mean met the FRL when the additional sample data was integrated.

Additional samples will be collected north of CU O20 during the Area 9, Phase I off-property certification process.

Action: The content of the above response will be incorporated into the revised A1PI Certification Report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.3.5 Page #: 5-5 Line #: 14
Original Specific Comment #: 5
Comment: The text describes the intervals used for collection of samples for radium-228 analyses. It is critical to precisely determine the depths of the contamination present in this CU in order to ensure that adequate corrective action has been taken. The soil placed in the sample jars should have been representative of the soil contamination at a particular depth. The sampling depth may have been interpreted imprecisely if total recovery did not occur during sampling. The text should be revised to provide recovery or other data supporting the sampling interval designations.

Response: Comment Acknowledged. When collecting Geoprobe® cores, the cores are measured to determine the amount of the sample interval recovered. Generally, if a total recovery is not achieved this fact is noted in the field log, and the operator will collect a parallel core so a total recovery is realized. Field logs for the Geoprobe® core samples obtained during the Ra 228 corrective action in CU O20 have been reviewed for entries indicating less than total recoveries . As a result of reviewing field logs generated during the corrective action in CU O20, there was no indication that Geoprobe® cores collected during this sampling event had less than complete recoveries.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.3.5 Page #: 5-5 Line #: 30
Original Specific Comment #: 6
Comment: The text states that confirmatory samples were collected from the area of the CU O20 hot spot, and the total uranium analytical results are provided. It is important to determine whether the contamination in this area was adequately evaluated and delineated. Illustration of the total uranium results on a figure would assist in this determination. Therefore, the analytical results should be illustrated in Figure *TBD*.

Response: Comment acknowledged.

Action: Figure 5-13 shows the sample locations for the confirmation samples in the CU O20 area after excavation. Uranium sample results were added to Figure 5-13 and the revised figure is provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Tables 5-6 and 5-7 Line #: NA
Original Specific Comment #: 7
Comment: The tables provide post-corrective action radium-226 concentrations and their corresponding depth intervals for CUs Q18-40A and Q18-40B. Many of these concentrations increase with depth at the sampling locations. The data appear to indicate another source aside from air dispersion that contributed to the radium-226 contamination in this area. The text should be revised to address this issue.

Response: Q18-40 failed on the first certification effort for radium-226 only. The elevated levels were confined to the southern half of this CU so the CU was divided into Q18-40A (north) and Q18-40B (south). A corrective action plan was carried out and Q18-40B was excavated and recertified while Q18-40A was recertified with no excavation. Serial sequential

sampling was conducted on Q18-40B and samples were analyzed to select the correct interval to certify. The following table summarizes the radium-226 data presented on Tables 5-6 and 5-7.

CU	Interval	Number of Samples	Mean Ra-226 Concentration
Q18-40A	0-6 inches	12	1.28 pCi/g
Q18-40A	6-12 inches	12	1.43 pCi/g
Q18-40B	6-12 inches	12	1.43 pCi/g
Q18-40B	12-18 inches	12	1.33 pCi/g

Review of the average concentrations does show a slight increase at depth for CU Q18-40A, but a decrease for CU Q18-40B. For the background data set the 95th percentile for radium-226 is 1.42 pCi/g. The concentrations measured in these CUs are all within the background levels and the analytical uncertainties. Therefore, this data does not bring into question that the radium-226 contamination came from another source than air deposition.

Action: This explanation will be incorporated into the revision of the Area 1, Phase I Certification Report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Table 5-9 Line #: NA
Original Specific Comment #: 8
Comment: The text below the table states that the location where the original certification sample with a total uranium concentration of 205.4 milligrams per kilogram (mg/kg) was collected is identified as Sample Point 1. This designation does not correspond with the designation of the hot spot sampling location depicted in Figure 5-9. The text or figure should be revised to resolve this apparent discrepancy.

Response: Figures 5-9 and 5-13 incorrectly demonstrate the hotspot sample location within CU O20.

Action: Figure 5-9 and 5-13 will be corrected. Table 5-9 is correct and needs no revision.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Table 5-9 Line #: NA
Original Specific Comment #: 9
Comment: The table summarizes the depth increments analyzed for each of the sampling locations in CU O20. Apparently only a portion of the sampling locations were extended to include 18 inches of sampling interval. The text should be revised to provide the rationale for the sampling strategy used.

Response: Comment Acknowledged. Additional description of the sampling strategy is required.

Action: The following text will be added to Section 5.3.5, Page 5-5 of the A1PI to summarize the sampling strategy.

.... The existing analytical and HPGe data obtained in CU O20 was kriged to illustrate the lateral and vertical extent of the total uranium contamination at the identified hot spot and immediate surroundings. Based on this kriging, sample points in O20 were selected to

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bound the surface and subsurface extent of total uranium in the area of potential influence around the hot spot. The model indicated a surface contamination condition (i.e., a greater area of probable total uranium contamination present in the surface soil layer). Several strategic sample points close to the hot spot were chosen to gain adequate surface and subsurface delineation data to design the corrective action excavation. Additional sample points were selected away from the hot spot to collect surface data to further bound the extent of surface contamination. The combined data points are shown in Figure 5-9 ....

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Table 5-10 Line #: NA
Original Specific Comment #: 10
Comment: The text provides sample numbers designated as "original" 1 through 12 and "new" 1 through 7. This sample numbering scheme is confusing and may cause improper data interpretation. The sample numbers should be revised to 1 through 19. This sample numbering scheme should also be used in Figure 5-14.

Response: Comment acknowledged.

Action: The sample location numbers in Table 5-10 and Figure 5-14 will be changed to match those listed in Appendix A, CU O20 Radium-228 Map of Data Points.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Table 5-11 Line #: NA
Original Specific Comment #: 11
Comment: The table states that sample NAR-4-8C-(X) corresponds with the 15- to 21-inch sampling interval and that sample NAR-4-8C2-(X) corresponds with the 38- to 42-inch sampling interval. In Figure 5-15, however, the opposite is shown. Either the table or figure should be revised for accuracy.

Response: Comment acknowledged. Table 5-11 is incorrect and will be changed to reflect the correct depth for the two samples. Figure 5-15 is correct as it appears in the document.

Action: Table 5-11 will be corrected.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Table 5-11 Line #: NA
Original Specific Comment #: 12
Comment: The table does not include a line for sample NAR-4-15C-(X) and its corresponding depth interval. The table should be revised to include this information.

Response: Comment acknowledged.

Action: The depth interval for sample NAR-15C-(X) is 70-74 inches. This information will be added to Table 5-11.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Figure 5-7 Line #: NA
Original Specific Comment #: 13
Comment: This figure identifies the random sampling points in CU P17-32. However, Sampling Location 17 is not shown in the figure. The figure should be revised to include Sampling Location 17.

Response: Agreed.

Action: Figure 5-7 will be revised to include Sampling Location 17.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Figure 5-8 Line #: NA
Original Specific Comment #: 14
Comment: The figure provides the pre-excavation and post-excavation elevations for CU P17-32. However, the elevation information shown for the central, eastern border of the CU does not include a post-excavation elevation. The figure should be revised to include the post-excavation elevation for this location.

Response: Comment acknowledged. The elevation value referred to on the eastern boundary of CU P17-32 was on the very edge of the 6-inch excavation, thus was not excavated itself. For this reason the point retains the same value for both pre-excavation and post-excavation.

Action: No Action.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Figure 5-9 Line #: NA
Original Specific Comment #: 15
Comment: The figure shows the sampling locations in CU O20 selected to support hot spot removal. However, the figure does not include Sampling Location 2. The figure should be revised to show this sampling location. In addition, the figure should include a reference to the original hot spot sample number.

Response: Comment acknowledged

Action: Figure 5-9 will be corrected with Sample Location 2 labeled and the hot spot sample location properly referenced as Sample Location 1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5 Page #: Figures 5-10, 5-11, 5-12, and 5-13 Line #: NA
Original Specific Comment #: 16
Comment: The figures provide the total uranium concentrations for separate sampling depth intervals and the hot spot excavation depths for CU O20. The figures are currently somewhat unclear. To clarify the figures, they should be revised to show all the sampling locations and their corresponding numbers.

Response: Comment acknowledged

Action: Figures 5-10 through 5-13 will be revised to show all of the sample locations and sample numbers.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: Data Tables Line #: NA
Original Specific Comment #: 17
Comment: The data tables in Appendix A present the concentrations of contaminants of concern detected at the site. However, no units of measure are listed in the tables. The tables should be revised to include the units of measure for each of the concentrations listed.

Response: Comment acknowledged

Action: The tables were edited to include units and reprinted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: Data Tables Line #: NA
Original Specific Comment #: 18
Comment: The data tables in Appendix A include data summaries for samples analyzed for cesium-137 and thorium-230. Appendixes B and C do not provide such summaries for CU N19. The document should include supporting data for all the tables in Appendix A.

Response: Comment acknowledged

Action: Appendices were reviewed and missing data is included in revised tables in Appendix A.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: 020 Primary Rad Map Line#: NA
Original Specific Comment #: 19
Comment: The figure labels the new and original data points sequentially from 1 through 19. These labels do not correlate with Figure 5-14, where the data points are labeled as original Sampling Points 1 through 12 and new Sampling Points 1 through 7. The figures should label the data points identically.

Response: Comment acknowledged

Action: The sample location numbers in Table 5-10 and Figure 5-14 will be revised to match those listed in Appendix A, CU O20 Radium-228 Map of Data Points.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: Data Table CUO20 Line #: NA
Original Specific Comment #: 20
Comment: The data table for CU O20 summarizes the total uranium data. This table omits a value for total uranium in sample O20HS-1-R-13. The table should be revised to include this information.

Response: Comment is not clear as written.

Action: The Total Uranium result for sample O20-HS-1-R-13 in the Appendix A data table is listed as 12.81. The formatting of this table may be confusing and will be corrected.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: Data Tables Line #: NA
Original Specific Comment #: 21
Comment: These data tables are not entirely consistent with the data summaries in Appendix B. For example, the table for CU P17-22 indicates that radium-226 was measured at 2.66 picocuries per gram (pCi/g) and radium-228 was measured at 2.61 pCi/g in sample P17-22C2-R-2. However, the data summaries indicate that the concentrations of radium-226 and radium-228 in sample P17-22C2-R-2 were 1.33 and 1.31 pCi/g, respectively. The data tables in Appendix A and data summaries in Appendix B should be compared, and all such inconsistencies should be resolved.

Response: Comment acknowledged

Action: For the example given, a re-analysis was performed on the sample. The "old" value was not given a "Z" qualifier which would automatically discount it from being considered. Because of this, the two values were inadvertently added together when the new value was pulled up. The statistics were generated using the correct numbers, so no error was carried over into the statistical evaluation. The data tables of Appendix A and Appendix B were carefully reviewed for other errors. Errors were corrected and the affected tables reprinted. The data table for CU P17-22 will also be corrected and reprinted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: Q19-30 Primary Rad Map Line #: NA
Original Specific Comment #: 22
Comment: Sampling Location 5 is not depicted in the figure. The figure should be revised to show this data point.

Response: Comment acknowledged

Action: The CU Q19-30 Primary Rad Map was corrected and reprinted with Sampling Location 5 indicated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: A1P1ST-1 Metals Map Line #: NA
Original Specific Comment #: 23
Comment: The figure contains an unlabeled data point. The figure should be revised to label this data point.

Response: Comment acknowledged. The unlabeled data point in the A1PIST-1 Metals Map does not represent a sampling location.

Action: This Figure was corrected and reprinted with the unlabeled data point excluded.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: NEAR-1 Metals Map Line #: NA
Original Specific Comment #: 24
Comment: The figure contains a data point with two location numbers, 14 and 16. The figure should be revised to display only the single, discrete label for this point.

Response: Comment acknowledged. The data point labeled 14 and 16 in the NAR-1 Metals Map actually refers to Sampling Location 14.

Action: This figure was revised and reprinted with the data point correctly numbered.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A Page #: NEAR-1 PCBs Map Line #: NA
Original Specific Comment #: 25
Comment: The figure contains a data point with two location numbers, 14 and 16. The figure should be revised to display only the single, discrete label for this point.

Response: Comment acknowledged. The data point labeled 14 and 16 in the NAR-1 PCB Map actually refers to Sampling Location 14.

Action: The figure was corrected and map reprinted with this data point correctly numbered.

RESPONSES TO OHIO EPA COMMENTS ON THE AREA 1, PHASE I CERTIFICATION REPORT

Commenting Organization: OEPA Commentor:
Section #: Not Applicable (NA) Page #: NA Line #: NA
Original Comment #: 1

Comment: The Ohio EPA will not concur that an area is certified prior to the work actually being completed. Specifically, excavations in the areas of the North Access Road and the adjacent ditches are deferred to the future. The Ohio EPA does not intend to certify areas as remediated until all activities have been completed.

Response: Comment acknowledged. DOE agrees that CUs NAR 1-6 can not be considered certified until the specified road material, fill material, and uncertified soil has been excavated and disposed of appropriately. The six CUs comprising the Old North Access Road (NAR) and ditches in A1PI (certification units NAR 1-6) were certified "in place" by taking waste acceptance criteria (WAC) and certification samples at depth and analyzing them as per previous agreement reached with the Regulatory Agencies. No WAC or certification sample result obtained when sampling these certification units (CUs) was at or above the FRLs for ASCOCs. In order to remove artificial or imported media that can not be certified, a level of excavation into native material residing beneath the road fill is specified. When this road and fill material in CUs NAR 1-6 is excavated to the specified depth, certification of these CUs will be considered complete. However, due to construction demands, completing excavation of the NAR CUs will be a phased process dictated by the OSDF construction schedule.

A northern section of approximately 350 feet of the NAR between the intersection of the new NAR and the northern perimeter of the OSDF has been left intact to provide support for the construction of the OSDF. It will be necessary to keep this unexcavated northern section of roadway intact until the completion of OSDF construction. Beginning at coordinate N 483445, E 1351342 approximately 1,300 feet of the NAR within the OSDF footprint (Cells 1, 2 and half of Cell 3) has been excavated to or beyond the specified certification depth. This excavated zone currently terminates at coordinates N 482175, E 1350928 which is approximately 250 feet north of the southern extreme of the A1PI NAR CUs. The southern (250 feet) and northern (350 feet) sections of the old NAR will not be considered certified until the artificial or imported materials have been excavated.

The remaining southern 250 foot section of certified in place old NAR, will be excavated during July 1998 to accommodate the construction of the OSDF Cell 2 compacted clay liner. The northern section of the old NAR will be transferred to Area 10, Corridors, and will no longer be considered a portion of Area 1, Phase I.

The roadway south of A1PI has not been subjected to certification and WAC attainment sampling and will be addressed in the work scope detailed in the Certification Design Letter (CDL) for Area 1 Phase II, Sector 3. After in place certification and WAC attainment are completed, the remaining sections of the old NAR will be excavated sequentially to accommodate the construction of OSDF Cells 4, 5, 6, 7, and 8.

Action: The A1PI Certification Report will be revised to include a figure that depicts the status the remaining sections of the certified in place old NAR. An additional figure based on as-built information will illustrate the depth of excavation that has been achieved in the excavated portions of the NAR. The report will also include a schedule for the removal of the southern 250 foot section of the A1PI NAR CUs. The northern section of the A1PI NAR CUs will be removed from the A1PI Certification Report as this section of road will remain in place until the completion of OSDF construction. This northern section will be certified when it is excavated to the specified depth of certification sampling, and will be addressed in Area 10.

Commenting Organization: OEPA Commentor:
Section #: 1 Page #: 1-2 Line #: 9
Original Comment #: 2
Comment: Figure 1-2 is not sufficiently illustrative to delineate areas that have been excavated from areas that have not been excavated. Figure 1-2 appears to have been lifted straight out of the OU5 RI/FS. Replace this figure with a figure showing the CUs, the areas excavated, and the areas where excavation was not performed.

Response: Comment acknowledged. OEPA is correct in their observation that Figure 1-2 in the A1PI Certification Report is based on an overlay of the proposed soil excavation footprint using RI/FS data. This Figure has a misleading title and instead of "A1 PI Excavation Footprint" should be titled "Preliminary Sitewide Soil Excavation Footprint Based on RI/FS Characterization Data". Figure 3-1 titled "Excavation Limits of A1 PI" shows the actual boundaries that were excavated as a result of Area 1, Phase I remediation.

Action: The title of Figure 1-2 will be corrected in the revised report to "Preliminary Sitewide Soil Excavation Footprint Based on RI/FS Characterization Data".

Commenting Organization: OEPA Commentor:
Section #: 1 Page #: Figure 1-1 Line #: NA
Original Comment #: 3
Comment: This Figure (Figure 1-1) should be revised to show the new Remediation Area 8 west of Paddy's Run Creek.

Response: Agreed. Figure 1-1 titled "General Remediation Areas 1 through 7" was accurate at the time this document was prepared. Subsequently, General Remediation Areas 8, 9, and 10 have been added to account for the Area between Paddy's Run and the west boundary of the site, the off-property Area adjacent to the east boundary of the site, and the Areas of the site that contain the Advanced Wastewater Treatment Facility and Long-Term Corridors, respectively.

Action: General Remediation Areas 8, 9, and 10 will be added to Figure 1-1.

Commenting Organization: OEPA Commentor:
Section #: 2 Page #: 2-9 Line #: 14
Original Comment #: 4
Comment: We agree that it is preferable to sample for primary and secondary COCs from the same locations. We expect in the future, the CUs for both primary and secondary CUs *COCs* will be collocated.

Response: Agreed. Simplification of the certification process is beneficial to all parties. CUs and sampling points for primary and secondary COCs will be collocated in the future whenever possible.

Action: Future certification strategy reflects this understanding, and is discussed in the revised Sitewide Excavation Plan (SEP).

Commenting Organization: OEPA Commentor:
Section #: 2 Page #: 2-9 Line #: 18
Original Comment #: 5
Comment: The discussion on "weighting factors" is unclear. However, we do agree that the statistical approach used is appropriate and that the use of weighting factors should be avoided.

Response: Comment acknowledged. The referenced discussion attempted to explain the certification sampling approach used in A1PI. In order to simplify the method of statistically processing certification results, each sample result obtained from a CU would be given equal merit or "weight". This would prevent an additional assumption (regarding what proportion of a CU one sample represents) being required in the statistical calculations. In order to achieve this in a consistent manner, each CU is always divided into 16 subunits. If the geometry of a CU isn't a square or rectangle, in an unbiased manner it is divided into sixteen subunits that are as equal in area as possible. A sample obtained at random from within each one of these subunits will then be considered equal to the other samples obtained from that CU. Using this process no additional "weighting factor" is necessary.

Action: The discussion on the "weighting factor" concept will be deleted from the text.

Commenting Organization: OEPA Commentor:
Section #: 3.4 Page #: 3-2 Line #: NA
Original Comment #: 6
Comment: The discussion in this section is appropriate and helpful. Please include a similar discussion with future certification reports. Ohio EPA has previously asked for additional information on the areal extent of soil excavations. We would like to see a calculation that compares the volume of soil actually in the piles to the volume of soil calculated using the number of acres excavated in a nominal 6 inch lift. (Of course a "fluff" factor will be required to compare the bank volume with the pile volume.) For example, the Executive Summary states that 59 acres were excavated.

(59 acres x 43,560 ^{ft}/acre x 0.5 ft. depth)/27 ft^3/yd^3) = 47,600 yd^3 excavated
47,600 yd^3 x 10% fluff factor = 50,000 yd^3 more or less

This is somewhat more than the 37,400 yd^3 quoted in Table 3-1. Since the debris piles total less than 1000 yd^3, their additional volumes do not help very much to reconcile the difference.

Response: Of the 59 acres that made up A1PI (East), 46 acres (minus the A1PI sediment traps and berm materials) were excavated and placed in the East Impacted Soil Stockpile (EISSP). In Table 3-1 of the A1PI Certification Report, it was stated that the EISSP contains 30,300 yd^3 of soil resulting from the excavation of a 6-inch lift from the surface of 46 acres subjected to remediation east of the north access road. A 6-inch lift of surface soil over an acre generates approximately 807 yd^3 of soil (0.5 ft deep x 43,560 ft^2/27 ft^3 per yd^3 =

approx. 807 yd^3) of bank volume (no fluff factor applied). Survey measurements used for this volume calculation were made prior to the completion of placement activities on the east stockpile from excavations performed in A1PI. More current independent survey measurements obtained by B.L. Payne and Associates indicated that there is approximately 34,700 yd^3 of soil in the EISSP.

Of the 46 acres on the east side of the NAR that contributed soil to the EISSP, deductions must be made for subareas within the 46 acres, but did not contribute soil volume to the stockpile. Subareas that must be subtracted from the 46 acres prior to determining volume estimates are the A1PI sediment traps A1PIST-1, A1PIST-2, and A1PIST-3. The sediment traps remain in place along with their excavated berm material. The estimated area of the combined A1PI sediment traps is 1.8 acres. This total subtracted from 46 acres is 44.2 acres of effective area that was excavated and contributed to the EISSP. 44.2 acres x 807 yd^3/acre = approx. 35,700 yd^3. This volume estimate is within 1,000 yd^3 of the recently calculated volume of 34,700 yd^3. This is within a 10 percent margin of error even considering the 1,300 yd^3 contributed by CU Q18-40B. The fluff factor of expansion of bank volume into stockpile volume is not known but would be minimal due to the effective compaction of soil during placement by heavy equipment.

Action: Revised volume estimates of the stockpiled material including the East Impacted Soil Stockpile and sources will be added to the revised tables and text.

Commenting Organization: OEPA Commentor:
Section #: 4.1.2 Page #: 4-2 Line #: NA
Original Comment #: 7
Comment: There are several unresolved issues relating to the analytical procedures for radioactive COCs.

1. The Ohio EPA has not received the letter report (page 4-3 line 6) detailing the discrepancies between alpha spectroscopy and gamma spectroscopy methods for analysis of thorium-232.

2. This is the first mention that we recall of a site-specific Th-232 standard for soils. We have discussed a soil standard for technetium-99 and we are optimistic that this standard will be valuable in assessing the significance of any analytical discrepancies between split soil samples.

3. The document does not provide a mechanism to effect closure on any of these issues or a way to track progress. Please suggest a way to keep the regulators appraised of the evolving status of these procedures.

Response: 1. Please see response to USEPA Original General Comment 1.

2. The technetium-99 soil standards of 5 pCi/g and 30 pCi/g representing the minimum detection limit (MDL) and FRL/WAC respectively were made up in order to increase the level of confidence in analytical methods used for analyzing soil samples for this constituent. Using similar logic, bulk soil was obtained from an on-site area (Southern Waste Units) known to have slightly elevated levels of radiological constituents including thorium-232. The goal was to completely homogenize this material for use

as an analytical standard or control. This is being completed so that DOE can utilize a standard that contains thorium 232 "in the range" of the site FRL.

3. Analytical issues such as these should be discussed in the DOE/Agency weekly conference calls or monthly meetings, as they arise, to discuss progress on the analytical issues such as technetium-99, thorium-232 alpha/gamma question and other pertinent analytical or laboratory issues.

Action: Please see action to USEPA Original General Comment 1.

1. Details of the thorium-232 analytical soil standard development program will be provided to the regulators.

2. Discuss pertinent analytical and laboratory issues as necessary during the weekly DOE/Agency conference calls, or monthly meetings.

Commenting Organization: OEPA Commentor:
Section #: 4.3 Page #: 4-7 Line #: NA
Original Comment #: 8
Comment: The Ohio EPA considers that duplicate samples are most useful as a check of sampling and lab errors. We believe that it is more appropriate to report the original sample concentration than it is to average the original and the duplicate.

Response: Comment acknowledged. The standard procedure has been to average field duplicate sample results (as opposed to laboratory duplicates) with the result from the original sample result. A field duplicate originating from a sample point is by definition of equal validity to the original sample. A duplicate sample is normally collocated and not "split" and therefore can have a different concentration of constituent(s) if the region is non-homogeneous. Selecting the original sample result or the duplicate result as "more valid" is arbitrary. The goal of a characterization sampling is to obtain a representative concentration of that sample point, and this is best done by averaging the original and duplicate sample results.

Action: No Action.

Commenting Organization: OEPA Commentor:
Section #: Appendix E Page #: E-72 Line #: NA
Original Comment #: 9
Comment: The original comment suggested the use of a riffle splitter and the response adequately addressed our concerns. However, the response also brings to mind outstanding issues with potential volatilization of technetium during the drying step. These potential problems first came to light during the split sampling performed for WAC attainment in Area 2, Phase I. Concerns such as these will be better addressed during the regulators review of the Sitewide CERCLA Quality Assurance Plan (SCQ).

Response: Comment acknowledged. In order to resolve this comment, DOE passed the question on to our laboratory subject matter experts who consulted with nationally recognized authorities on the technetium-99 volatility issue. Their report concluded without reservation that technetium-99 will not volatilize to any significant degree as a result of preparation and drying methods used by the DOE on-site laboratory or off-site contract laboratories.

Action: A copy of the referenced technetium volatility report will be included with the revised document.