Responses to USEPA Comments
on the OU-4 FS
Anniston, Alabama

Comments:		Response:
#	**General Comments Section 6**	
1.	On Table 6.5 Summary of Ecological and Human Health RGOs and PRGs, the PCB range for whole fish in the BERA addendum should range from 0.4 to 1.5 mg/kg dw, instead of 27.3 mg/kg. The low end of the RGO range and PRG should be 0.4 mg/kg dw.	The preliminary remedial goal (PRG) value for whole-body fish (27.3 milligrams per kilogram dry weight [mg/kg dw]) is from page 21 of the Operable Unit 4 Baseline Ecological Risk Assessment Addendum (OU-4 BERA Addendum) that was prepared by the United States Environmental Protection Agency (USEPA). Because this PCB concentration is directly applicable to whole-body fish, it was included on Table 6-5 of the OU-4 Feasibility Study (OU-4 FS). This PRG can be directly measured in whole-body fish to assess remedy effectiveness for the fish themselves. The values mentioned in USEPA's comments are for remedial goal options (RGOs) presented in Table AD-63b of the OU-4 BERA Addendum. The RGOs presented in Table AD-63b are for sediment and do not apply to fish tissue. Instead, the sediment RGOs presented in Table AD-63b are modeled sediment concentrations derived by assuming a relationship between sediment and fish tissue and using that ratio to estimate a sediment concentration from the tissue thresholds discussed above. Because the relationship between fish tissue and sediment is uncertain (i.e., regression analysis indicates no significant relationship), these values are considered to have a higher level of uncertainty than comparing measured fish tissue to the identified threshold of 27.3 mg/kg dw. The PCB sediment concentrations that were calculated to be protective of fish (Table AD-63b of the OU-4 BERA Addendum) range from 0.4 mg/kg dw for predatory fish to 1.5 mg/kg for forage fish. Note that the 0.4 value for predator fish has the highest uncertainty because it assumes a direct relationship between the sediment and the fish tissue, when in fact, predatory fish exposure is based primarily on the consumption of smaller prey fish. The low end of this range (0.4 mg/kg dw) is listed in Table 6-5 of the OU-4 FS along with the selected sediment PRG to protect ecological receptors in the OU (surface-weighted average concentration [SWAC] of 0.63 mg/kg dw). The selected sediment PRG (0.63 mg/kg dw) protects the wide range of receptors identified in Table 6-5 of the OU-4 FS and is numerically well below the sediment values protective of all fish of 1.2 mg/kg dw and is also below the values for bottom (0.8 mg/kg dw) and forage (1.5 mg/kg dw) fish that would be expected to have more direct exposure to the sediment.

Comments:		**Response:**
2.	Include figures to show paired data concentrations for PCBs and TEQ in soil and PCBs and TEQ in sediment.	The revised OU-4 FS includes additional figures with paired results for PCB and toxic equivalent quotient (TEQ). The revised figures are part of a figure set (Figures 4-37a and 4-37b) where all the PCB and TEQ results for soil are presented on Figure 4-37a based on the distance from Lake Logan Martin along the axis of Choccolocco Creek to the sample collection location. A subset of these results is presented on Figure 4-37b and only includes those sample results where both PCB and TEQ results are available for a common sample (same location and depth increment). The figure set for Figures 4-38a and 4-38b is similar with the exception that the PCB and TEQ results are presented based on the distance between the creek bank and the collection locations. The revised figures are part of a figure set (Figures 4-52a and 4-52b). PCB and TEQ results for sediment are presented on Figure 4-52a based on the distance from Lake Logan Martin along the axis of Choccolocco Creek to the sample collection location. A subset of these results is presented on Figure 4-52b. This subset only includes those sample results where both PCB and TEQ results for sediment are available for a common sample (same location and depth increment).
3.	Include figures to show paired data concentrations for PCBs and mercury in soil and PCBs and mercury in sediment	The revised OU-4 FS includes figures to show paired data concentrations for PCBs and mercury in soil and PCBs and mercury in sediment. The revised figures are part of a figure set (Figures 4-45a and 4-45b). PCB and mercury results for soil are presented on Figure 4-45a based on the distance from Lake Logan Martin along the axis of Choccolocco Creek to the sample collection location. A subset of these results is presented on Figure 4-45b and only includes those sample results where both PCB and mercury results are available for a common sample (same location and depth increment). The figure set for Figures 4-46a and 4-46b is similar with the exception that the PCB and mercury results are presented based on the distance between the creek bank and the collection locations. The revised figures are part of a figure set (Figures 4-57a and 4-57b) where all the PCB and mercury results for sediment are presented on Figure 4-57a based on the distance from Lake Logan Martin along the axis of Choccolocco Creek to the sample collection location. A subset of these results is presented on Figure 4-57b and only includes those sample results where both PCB and mercury results for sediment are available for a common sample (same location and depth increment).

Comments:		**Response:**
#	**Comments on Residential Soil**	
4.	**Section 3.1 Residential Removal Program, page 3-2** – Correct first partial paragraph and first full paragraph to reflect that excavation was required for PCBs greater than "or equal to" 1.0 mg/kg in surface soil (quotation added to emphasize missing words).	The requested revision has been made to the OU-4 FS.
5.	**Section 7.1 Residential Soil** - Include number of properties that may have residuals beneath structures or driveways that need to be part of soil management plan and reflect that information on a table with addresses or PPINs that need to be part of soil management plan because of surface soil PCB concentrations, subsurface soil PCB concentrations, and structures adjacent to excavated areas.	The requested information has been included in a new table (Table 7-1) in the OU-4 FS.
6.	**Section 9.1 Residential Soil, page 9-1**. The second alternative should say "greater than or equal to 1.0 mg/kg and subsurface soil with PCB concentration of greater than or equal to 10.0 mg/kg (400 cubic yards)" to be the same as the NTCRA.	The requested revision has been made to the OU-4 FS.
7.	**Section 9.1, Table 9-1a** – Change remedial alternative names to the following: • RS-2: Excavation and on- or off-site disposal for surface soil with PCB concentrations of ≥1.0 mg/kg and subsurface soil PCB concentration of ≥10.0 mg/kg, and • RS-3: Excavation and on- or off-site disposal for surface soil and subsurface soil with PCB concentrations of ≥1.0 mg/kg •	The requested revisions have been made to the OU-4 FS.
8.	Modify Sections 10 and 11 to reflect consistent alternative names.	The requested revisions have been made to the OU-4 FS.

Comments:		**Response:**
Comments on IMs Soil		
9.	**Section 7.2 Interim Measures** – Clarify if the candidate removal area is for outfield soil only since one foot of infield was already replaced with clean soil. Do IM-4 and IM5 include soil between fields?	The interim measure (IMs) areas proposed for remediation were clarified in the Section 7 text of the OU-4 FS to reflect that the areas located between Fields A, D, and C are part of the remedial footprints.
10.	**Section 9.2 Interim Measures** – Remedial alternative names in section do not match Table 9-1b, and following sections and tables. Please check for consistency.	Revisions have been made as needed.
11.	**Section 9.2, Table 9-1b** – Change remedial alternative names to be more descriptive and distinguishing, such as: • IM-2: Long-term monitoring and maintenance and soil management • IM-3: Excavation and on- or off-site disposal for outfield surface soil in Field A, and long-term soil management for PCBs ≥1.0 mg/kg in and between outfield soil on fields C and D and at depth • IM-4: Excavation and on- or off-site disposal for outfield surface soil in (***and between)*** Fields A, C, and D, and long-term soil management for PCBs ≥1.0 mg/kg in soil at depth • IM-5: Excavation and on- or off-site disposal for surface soil in (***and between)*** Fields A, C, and D, excavation and off-site disposal of subsurface soil with PCB concentrations greater than or equal to 50 mg/kg in Field C, and long-term soil management for PCBs ≥1.0 mg/kg in soil at depth •	The requested revisions have been made to the OU-4 FS.
12.	Modify Sections 10 and 11 to reflect consistent alternative names.	Revisions have been made as needed.

Comments:		Response:
#	**Comments on Nonresidential Soils**	
13.	**Section 4.2.1.1 PCBs in Nonresidential Soil, PCBs in Surface Soil** – Provide discussion, tables, and figures for 0-6 inches of surface soil as well as 0-12 inches of surface soil since the proposed cleanup is based on the 0–6-inch soil horizon. Clearly state when data represents length weighted average concentrations.	Figures showing surface and subsurface polychlorinated biphenyl (PCB) concentrations in soil (by PCB concentration range) for human health receptor are already included in the OU-4 FS as the Figure 4-32 series. For this figure set, surface soil is defined as the 0–1-foot horizon and subsurface soil is defined as the 1–4-foot horizon. For these two horizons (surface and subsurface), the PCB concentrations are based on length-weighted average PCB concentrations for samples collected within the specified horizons. The surface soil PCB concentrations for ecological receptors are presented in the OU-4 FS on the Figure 5-7 series. The results presented on this figure set are consistent with the data set used for the OU-4 baseline ecological risk assessment (OU-4 BERA and the OU-4 BERA Addendum completed by USEPA) and include 93% of samples collected from the 0–6-inch horizon and 7% of the samples have a top depth of 0 inches and a bottom depth of not more than 24 inches. The following tables have been added to the OU-4 FS: • Table 4-1b: OU-4 Length-Weighted Nonresidential Surface (0–1 foot) Soil PCB Data • Table 4-2: OU-4 Length-Weighted Nonresidential Surface (0–6 inches) PCB Data • Table 4-3: OU-4 Length-Weighted Nonresidential Subsurface (1–4 feet) Soil PCB Data
14.	**Section 4.2.1.1 PCBs in Nonresidential Soil, PCBs in Subsurface Soil** – The Last paragraph is confusing. Are all the subsurface soils statistics based on length-weighted average concentrations? Are all the lengths the same?	The subsurface and surface soil statistics are based on length-weighted average PCB concentrations, and this will be clarified in the revised text of the OU-4 FS. The length of all samples is not the same, but most surface soil samples were collected from the 0–6-inch and 6–12-inch intervals. Most subsurface soil samples were collected using 1-foot increments from 1 foot below ground surface.

Comments:		Response:
15.	**Section 4.2.1.2 Other COPCs in Nonresidential Soil** – Is there any distinction that needs to be mentioned about the 0–6-inch soil horizon, 0–12-inch soil horizon, or subsurface soil relative to other COPCs?	A distinction is not necessary as locations and depth increments where samples were analyzed for the other constituents of potential concern (COPCs) were the sample locations and depth increments that were used to analyze PCBs. Section 4.2.1.2 provides a robust discussion of the nature and extent for the other COPCs in nonresidential soil and reflects the data that were used to conduct both the human health and ecological risk assessments.
16.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** - A SWAC represents a risk-based cleanup level just like an EPC and should be applied as a UCL to account for variability and uncertainty in how well the post-remedial calculated SWAC mean will reflect the true post remedial population mean in each exposure unit. Exposure units with post remedial SWAC means below the clean-up goal, but SWACs UCLs exceeding the cleanup goal represent areas of unacceptable uncertainty, because there is a greater than 5% probability that the true post remedial population mean will exceed the risked-based clean-up goal. This is usually an indication that current sample density in the EU does not adequately capture the variability of contaminate distribution. The EPA plans to require that the selected remedy and remedial goal meet a 95% UCL SWAC. Consider if adjustments should be made to volumes.	The remedial areas and volumes developed in this OU-4 FS are based on mean SWACs. This approach was selected based on the following: • The PRGs used in the OU-4 FS are already low as they are based on multiple overly protective assumptions from the risk assessments. Using mean SWAC values to develop the remedial areas and volumes provides an overlay of risk management in the remedial decision processes that doesn't further compound the overprotectiveness of the remedy. • USEPA routinely selects mean SWAC values as the PRGs on similar sites rather than choosing the 95% upper confidence limit on the mean (UCL) values. • An alternative approach that could be used in the remedial design is the Incremental Sampling Methodology (ISM). This approach, by design, would satisfy USEPA concerns regarding a potential need to calculate 95% UCL SWACs and could be used for both floodplain soil and sediment. Predesign investigations conducted with ISM for the target remedial areas identified in the OU-4 FS would provide individual results for decision units that would stand on their own and would not require SWAC calculations.

Comments:		Response:
17.	**Section 9.3** – Are all non-residential properties with PCBs in soil ≥ 50 mg/kg below the proposed cleanup depth located in conservation corridors with restrictions on digging? If not, remedies that do not remove PCBs in surface or subsurface soil ≥ 50 mg/kg should have environmental covenant/easement requirements as part of the remedy.	There is only one location where after implementing NRS-2 or NRS-3 the PCB concentration in surface soil (the 0–1-foot horizon) is greater than or equal to 50 mg/kg and is located outside the protective confines of the Conservation Corridor. This location (C3N-17) has a PCB concentration of 123 mg/kg in the 6–12-inch horizon. The surface soil (0–6-inch) PCB concentration at this location was 18.7 mg/kg and is being remediated under the active nonresidential soil alternatives. Residual PCBs in the 6–12-inch horizon will be protected from unplanned disturbance by 811 as a long-term institutional control (IC). Compliance with 811 is required by law for all excavation activities whether they be conducted by the landowner, a commercial entity, a state or federal agency, or a utility company (including their subcontractors).
18.	**Section 9.3, Table 9-1c –** Add NSR-5 from information in Appendix A. Describe number of acres impacted and how many are in riparian zone. Change remedial alternative names to the following: • NRS-2: Excavation of COCs in soil in 0-6” soil horizon, off-site disposal, and long-term soil management including UECAs as needed • NRS-3: Excavation of COCs in soil in 0-6” soil horizon, off-site disposal, limited advance surface soil management for PCBs ≥ 50 mg/kg, long-term soil management including UECAs as needed • NRS-4: Excavation of COCs in soil in 0-6” soil horizon, off-site disposal, site-wide advance surface soil management for PCBs ≥ 50 mg/kg, long-term soil management including UECAs as needed • NSR-5: Excavation of COCs in soil in 0-6” soil horizon, off-site disposal, site-wide advance surface and subsurface soil management for PCBs ≥ 50 mg/kg, long-term soil management	The requested changes have been made to the OU-4 FS.
19.	Modify Sections 10 and 11 to reflect consistent alternative names.	The requested changes have been made to the OU-4 FS.

Comments:		**Response:**
#	**Comments on Sediment and Creek Banks**	
20.	Provide an update to the conceptual site model to account for creek bank contributions to sediment contamination.	No changes were made. The conceptual site model (CSM) discussion in Section 4.3.5 of the OU-4 FS includes creek bank erosion as a source that needs to be mitigated. The CSM diagram included as Figure 4-59 in the OU-4 FS also shows the movement of solids into and out of creek bank floodplain areas as fate and transport mechanisms.
21.	**Section 4.2.4 Fish Tissue** – In the description of mercury in fish where other sources are noted, it should be added that the highest mercury concentrations in sediment are in the backwater area. Provide figures like 4-13 and 4-14 except for mercury.	No change was made. Most of the sampling locations for the RCRA and CERCLA programs shown on Figure 4-13 were also analyzed for mercury and PCBs. The geographic distribution for mercury in sediment as a function of distance from Lake Logan Martin is presented in Figure 4-56 of the OU-4 FS. The mercury results presented in Figure 4-56 are also presented along with the sediment PCB results in Figure 4-57a.
22.	**Section 6.3.1.2 Preliminary RAOs for Sediment** - Add RAO to "Prevent the long-term downstream transport of COCs in Choccolocco Creek."	The requested remedial action objective (RAO) has been added to the OU-4 FS.
23.	**Section 6.3.2.1 Ecological PRG Values, Sediment PRGs** - The proposed PRG for sediment to protect ecological receptors is 0.63 mg/kg as a long-term SWAC. Define long-term SWAC. As illustrated in Table 6-5, this PRG is likely too high to protect ecological receptors (0.4 mg/kg dw for all birds and 0.13 mg/kg dw for some mammals). A lower not-to-exceed (NTE) PRG value for PCBs should be considered to reach sediment goals. Additionally, a PRG of 27.3 mg/kg dw for whole-body fish tissue was not identified as an RGO in the BERA Addendum as stated on Table 6-5, this value must be removed. A foot note needs to be added that directs the reader to where in the text the RGOs of 3 and 4 mg/kg dw are integrated into the floodplain soil SWAC of 6.0 mg/kg.	The long-term SWAC is the concentration value that will be achieved over time following remedy implementation through monitored natural recovery (MNR). The 0.63 mg/kg value is protective of all receptors at the population level and a lower not-to-exceed (NTE) is not warranted. When interpreting this value, consider the overly protective assumptions that are inherent in the calculation of hazard quotients (HQs) and PRGs. Specifically, (1) the receptor population has 100% site use and (2) the laboratory studies that provide the basis for the toxicity reference values (TRVs) are representative of OU-4 receptors and conditions. 1. Population site use: The lower value for birds is based on the great blue heron. The heron is a wide-ranging bird with a home range between 1.2 and 5 miles of riparian area. The entirety of OU-4 at 37 miles would include at most 30 pairs of herons (assuming all habitat was suitable, which it is not). Likewise, the lower values cited for mammals are for mink and otter, which have similar (mink) or much larger (otter) home ranges than the heron. Given that a population, and even individuals, would be integrating exposure over a much broader area than the riparian area within OU-4, the population exposure would be expected to be significantly less than 100%.

Comments:		Response:
		2. Representativeness of the TRVs: The TRVs that provide the basis for the calculated PRGs were selected at the low end of the range of protectiveness. A number of studies for both birds and mammals indicate that the effects threshold could be a higher concentration, resulting in a higher PRG. In addition, laboratory studies may not represent conditions at OU-4. Specifically, as stated by the authors of the mink study that provides the basis for the mink and otter TRV, the fish used to comprise the experimental diet contain "*numerous pesticides, heavy metals, polyhalogenated hydrocarbons (PHHs) known to be present in Great Lakes fish and have the potential to elicit adverse effects in other species as these contaminants move through the food chain*." For birds, several field studies resulted in no observed adverse effect levels (NOAELs) and lowest observed adverse effect levels (LOAELs) that are up to 6 times higher than the LOAEL used in the OU-4 BERA (Custer et al. 1998, Custer et al. 2003, Henning 2003). If these field-based values were used to estimate a PRG, the 0.4 mg/kg PRG could be as high as 2.4 mg/kg, indicating that the selected sediment value of 0.63 mg/kg dw is protective of birds. Regarding the 27.3 value for whole-body fish, The OU-4 BERA Addendum specifically states "*EPA recommended using the CTCs derived from the Foekema et al. (2014) study, …The study reported effects concentrations in terms of lipid weight which can be converted to whole body concentrations using the lipids measured in sole in Foekema et al. (2012) (2%). Disrupted or delayed development of larvae between 6 and 40 days after fertilization was observed at a tissue-residue of 6.82 mg/kg ww (27.3 mg/kg dw)*." This value was used as the basis for the sediment RGO provided in Table AD-63b. Removing this value is unwarranted as there is a USEPA-supported value for directly protecting fish in the OU-4 BERA Addendum that should be acknowledged in lieu of only calculated sediment to fish values that have higher levels of uncertainty. A footnote was added to Table 6-5 as follows: "*A description of the protectiveness and the rationale for the selection of specific PRGs is provided in Section 6.3.2.1 (ecological) and 6.3.2.2 (human health)*."

Comments:		Response:
24.	**Section 6.3.2.1 Ecological PRG Values, Sediment PRGs** A federally listed freshwater snail, Lacy elimia, may occur in the watershed. Please provide more specific information about the special considerations to protect this species. Specifically, clarify whether and how the proposed PRGs address risks to the Lacy elimia. The Choccolocco Creek watershed supports a high diversity of other snail and mussel species (see Distributions of Freshwater Mussel, Snail, and Associated Fish Species in Choccolocco Creek, Terrapin Creek, and Lower Little Cahaba River Watersheds, Alabama). Please include a description of the protection/mitigation measures that will be undertaken during remedial activities to protect these species in the environment while in-stream work is ongoing.	The PRGs developed for the OU-4 FS are protective for this federally listed snail and other listed species. As shown in the OU-4 BERA, when using mollusk-specific toxicity values, no risk is predicted to mollusks. The OU-4 BERA Addendum used a general toxicity value for the most sensitive benthic invertebrates that is not necessarily applicable to mollusk species. In addition, the United States Fish and Wildlife Service (USFWS) conducted a site-specific study that found that bivalves are less sensitive to OU-4 sediment than either the midge or amphipod evaluated under the site-specific sediment toxicity program (USFWS 2015). Thus, the PRGs selected for protection of benthic invertebrates are adequately protective of mollusks, including the listed species. Best management practices will be used during sediment removal (dredging) to limit the downstream migration of sediment resuspended during the dredging process. Benthic species within the sediment matrix will be removed from the creeks along with the sediment as part of the dredging process. Backfill materials placed following dredging will provide substrate for natural recolonization of benthic species. The current target sediment areas identified in the OU-4 (based on mean SWAC values) are either located in areas that are not prime benthic habitat (the backwater area) or are sporadically located downstream of Friendship Road where their intermittent nature will support natural recolonization of benthic species. Using a 95% UCL SWAC to identify sediment areas for remediation would result in habitat destruction for areas where threatened and endangered species are present in OU-4. The remedial footprints presented in the OU-4 FS are based on mean SWACs to achieve long-term PRGs and provide an appropriate balance between protectiveness and habitat destruction.

Comments:		Response:
25.	**Section 6.3.2.2 Human Health PRG Values** The proposed PRG for sediment is 0.63 mg/kg as a long-term SWAC. As illustrated in Table 6-5, this PRG is likely too high to restore fish tissue for human health (sediment PCB PRG 0.2 mg/kg dw upstream of Jackson Sholes and 0.11 mg.kg dw downstream of Jackson Shoals). A lower not-to-exceed (NTE) PRG value for PCBs should be considered to reach sediment goals. Additionally, the 0.56 mg/kg fish filet number in Table 6-5 should be 0.056 mg/kg.	There can be multiple PRGs for a given media and the 0.63 mg/kg value is to protect certain ecological species. Another example is the 2.6 mg/kg value to protect benthic species. The lower PRG values for sediment ranging from 0.1 to 0.2 mg/kg are based on calculations for the movement of PCBs into fish that would be consumed by human and ecological receptors. These later PRGs are theoretical, and the ultimate points of compliance will be the PCB concentrations in whole-body fish for ecological receptors and fish tissue for human receptors. The calculations conducted as part of this OU-4 FS show that over time, the remedy will meet these long-term goals. Based on these calculations and the overly protective calculations used to develop the PRGs, there is no need to lower the PRGs arbitrarily further for sediment. The typographical error on Table 6-5 was corrected.
26.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** -The process used to develop the sediment SWACs needs to be explained with the same level of detail as the non-residential soil SWACs. The FS includes Table 4-2. SWAC Calculation Details Table for PCB in Surface Sediments, which calculates a mean SWAC. The BERA included Table 4-4. EPC Calculation Details Table for PCBs in Surface Sediments, which calculates a different mean SWAC and a 95%UCL SWAC.	The process to develop the mean SWACs for sediment is described in Section 4.2.2.1 of the OU-4 FS. The process and results are consistent with the approach presented in the OU-4 remedial investigation report. The OU-4 BERA used similar approaches to develop mean SWACs and the 95% UCL SWACs. As described in the responses to comment numbers 16 and 25, the OU-4 FS was developed using mean SWAC values to provide a reasonable balance between a protective remedy and habitat destruction.

Comments:		Response:
27.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** - Sediment SWAC values applied over river reaches are used to evaluate the protectiveness of alternatives. However, the areas over which the SWAC is intended to be applied is still unclear. The protectiveness discussion (10.7.2.1) describes two areas (up and downstream from Jackson Shoals) and mentions the 6 reaches shown in Figure 4-50. The river reaches are quite long (several miles) for consideration as exposure areas relevant to fish tissue concentrations and protectiveness is unclear. Rolling ½ mile segments may be an appropriate SWAC evaluation area (i.e., RM 0-0.5; RM 0.1-0.6; etc…) during remediation.	It is premature to develop many of the details regarding the predesign investigations that will be conducted under the remedial design other than to focus on refining the areas identified for remediation in the OU-4 FS. Predesign investigations are not intended to recharacterize the Site. The reaches presented in the OU-4 FS were taken directly from the OU-4 RI and serve as the basis for identifying and evaluating remedial alternatives. Once the project moves into the predesign phase, decisions regarding characterization approaches for the target remedial areas identified in this OU-4 FS can be determined through collaborative discussions with USEPA.
28.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** - A sediment SWAC represents a risk-based cleanup level just like an EPC and should be applied as a UCL to account for variability and uncertainty in how well the post-remedial calculated SWAC mean will reflect the true post remedial population mean in each exposure unit. Exposure units with post remedial SWAC means below the clean-up goal, but SWACs UCLs exceeding the cleanup goal represent areas of unacceptable uncertainty, because there is a greater than 5% probability that the true post remedial population mean will exceed the risked-based clean-up goal. This is usually an indication that current sample density in the EU does not adequately capture the variability of contaminate distribution.	Please see response to comment number 16 regarding the application of SWACs to this OU-4 FS.

Comments:		Response:
29.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** - The concentrations of PCBs in sediment at Station 35 are low, generally less than 1 mg/kg and have an average surface sediment concentration of 0.52 mg/kg. Figures 10-1 and 10-2 indicate that it will take 20-35 years to reach PCB concentration of 0.1 mg/kg at station 35. How long will it take for higher PCB concentrations in other reaches to reach PCB concentration of 0.1 mg/kg based on 95%UCL SWAC?	The estimated time frames for the reaches of OU-4 located upstream of Jackson Shoals to achieve the long-term sediment PRG of 0.2 mg/kg (based on a mean SWAC) is described in Section 10.7.2.1 of the OU-4 FS and includes the following: • The long-term PRG for the 25 acres of Snow Creek and Choccolocco Creek where active remediation is conducted will be met immediately after placing the clean backfill after dredging or as part of capping (irrespective of the SWAC calculation approach). Under alternatives SED-2 and SED-3, the low-energy areas that undergo in-place treatment are projected to achieve the equivalent of the long-term PRG (irrespective of SWAC calculation approach) through reduced bioavailability over a 5-year period. • It will take 30 years for MNR to achieve the long-term PRG based on mean SWAC for the remaining areas based on an annual PCB mass winnowing rate of 6%. A range of 20 to 40 years is also presented for a range of PCB mass winnowing rates of 4% to 8%.
30.	**Section 7.3.1 Preliminary Areas and Volumes for Ecological and Human Health PRGs** -The FS should clearly state that the textural estimates for 79% of the surface sediment samples are based on visual estimates and not laboratory grain size measurements; this increases the uncertainty associated with the SWAC calculations.	Section 7.3.1 of the OU-4 FS is related to nonresidential floodplain soil and the comment appears to apply to Section 7.4.2. The visual characterization approach that was used to identify the texture for most sediment samples is described in Section 4.2.2.1 of the OU-4 FS. The specific text from Section 4.2.2.1 of the OU-4 FS relative to the developing the SWACs for Choccolocco Creek sediment indicates that…"*The SWAC values for surface sediment in the various creek reaches in OU-4 were calculated with the nature and extent data and ecological sediment data collected under the RCRA and CERCLA programs. These data were identified by location, sediment textural class, and PCB concentration and can be used to calculate SWAC values for the various reaches of Choccolocco Creek. The sediment textural classifications for 769 samples were used to develop the SWAC based on visual classifications. These visual classifications were cross-checked with 169 individual grain-size distribution results and an independent review of sample logs and photographs*." The text presented in Section 4.2.2.1 of the OU-4 FS (shown above) was taken directly from the OU-4 RI, and it is not necessary to restate this information in Section 7.4.2 of the OU-4 FS that discusses preliminary areas and volumes.

Comments:		Response:
31.	**Section 7.4.1 Creek Bank Areas -** Banks identified for removal are still based on location (only upstream of 29.5) with remediation based on erosive status, seemingly independent of PCB concentration. It would be more reasonable to identifying banks for remediation if they are erosive and exceed a NTE threshold. In addition, the banks should actually be sampled prior to remediation; right now, there are assumed concentrations from floodplain sampling. The bank management action level should be a concentration that satisfies the RAO that bank soil would not serve as a COC source to the sediment bed or downstream migration.	The assumption that PCB concentrations in creek bank areas are solely responsible for impacting the creek bank PCB loadings is incorrect. The source control evaluation presented in the OU-4 FS was conducted using PCB results for samples collected within 33 feet of the creek. This distance was selected as a balance between the potential for creek bank soils to erode into the creek and having sufficient PCB results to calculate average PCB concentrations per creek reach. The evaluation conducted using these results supported source control actions for creek bank areas with severe and moderate erosion upstream of river mile 29.5 (near the Coldwater Creek confluence) under one source control scenario. A second source control scenario addressed creek bank areas with severe, moderate, and minor erosion for the same 12.5-mile reach of Choccolocco Creek. The source control evaluation was conducted with Site data and not assumed PCB concentrations. This evaluation combined the PCB results with erosional conditions along the creek to develop a comprehensive understanding for where to control sources while minimizing habitat destruction. A sole focus on PCB concentrations would result in the unneeded destruction of valuable riparian habitat that could not be replicated. The old-growth trees that line much of the riparian buffer zone are decades to centuries old. The root structure that supports these old-growth trees run along the creek bank and parallel creek-flow. In addition to supporting the trees, this unique root structure maintains the long-term stability of these creek banks. In terms of PCB concentrations downstream of river mile 29.5, the calculated PCB concentration was 3.3 mg/kg and is the functional equivalent of the NTE concentration for sediment (2.6 mg/kg). The results of natural recovery calculations presented on Figures 10-1, 10-2, and 10-3 show that following remedy implementation, including creek bank source control and active sediment remediation, the long-term sediment PRGs for Choccolocco Creek will be met through MNR.
32.	**Section 7.4.2 Sediment** – Provide figures to show all areas where sediment remedy is proposed.	The requested figure for the downstream portion of OU-4 has been provided as Figure 7-15 in the OU-4 FS.

Comments:		Response:
33.	**Section 9.4, Table 9-1d** – The alternatives should be presented from lowest cost to highest cost. Change remedial alternative names to the following: • SED-2: Creek bank soil source control for contaminated areas with moderate and severe erosion, dredging of sediment in high-energy areas, off-site disposal soil and sediment, in-place treatment for sediment in low-energy areas, long-term soil management, and MNR of sediment. • SED-3: Creek bank soil source control for contaminated areas with minor, moderate and severe erosion, dredging of sediment in high-energy areas, off-site disposal soil and sediment, in-place treatment of sediment in low-energy areas, long-term soil management, and MNR of sediment. • SED-4: Creek bank soil source control for contaminated areas with moderate and severe erosion, dredging of sediment in high- and low-energy areas, off-site disposal soil and sediment, long-term soil management, and MNR of sediment. • SED-5: Creek bank soil source control for contaminated areas with minor, moderate and severe erosion, dredging of sediment in high-energy areas, off-site disposal soil and sediment, capping for low-energy areas, long-term soil management, and MNR of sediment. • SED-6: Creek bank soil source control for contaminated areas with minor, moderate and severe erosion, dredging of sediment in high- and low-energy areas, off-site disposal soil and sediment, long-term soil management, and MNR of sediment. • SED-7: Creek bank soil source control for contaminated areas with minor, moderate and severe erosion, dredging of contaminated sediment in high- and low-energy areas, off-site	The names of the remedial alternatives have been adjusted as requested.

Comments:		Response:
	treatment PTW, off-site disposal soil and sediment, long-term soil management, and MNR of sediment.	
34.	Modify Sections 10 and 11 to reflect consistent alternative names.	The requested consistency changes have been made to the OU-4 FS.
35.	**Section 9.4.2 Backwater Area** – Figure 7-13 shows a portion of the Backwater Area that is highlighted as a target sediment remediation area but is not indicated as a low or high energy area. Please revise the figure for clarity.	Figure 7-14 in the OU-4 FS (previously Figure 7-13) was revised such that there is a 100% match between the coverage of the high- and low-energy regimes and the proposed remedial footprints.
Comments Appendix A – Proposed Special Studies for Areas Located Downstream of OU-4		
36.	**Section 1. Introduction** – As you are aware, the EPA has made no decision, to date, regarding the scope of investigations and/or actions needed downstream of the OU4 portion of the Site. Additional data would inform that decision. Special studies are proposed to fill data gaps regarding the nature and extent of PCBs and other contaminants of concern in areas downstream of OU4. The current proposal is to design these studies as part of the Remedial Design of the OU4 remedy, and as such is years away from fruition. The EPA sees no reason to delay the design and implementation of these studies until the OU4 ROD and Consent Decree are complete. Consider a more aggressive implementation timetable.	Appendix A of the OU-4 FS has been revised such that the special studies are standalone activities.
37.	Lay Lake should also be addressed by special studies or other appropriate means.	The special studies presented in Appendix A are initially focus on Lake Logan Martin where the data for lower Lake Logan Martin will be reviewed to assess whether significant risks are present. If significant risks are present in this lower portion of Lake Logan Martin, the special studies may be expanded to include upper Lay Lake as an adaptive site management (ASM) decision.
38.	**Section 2.2:** Please add that the whole-body fish will be of a size range expected to be consumed by wildlife receptors.	The requested revision has been incorporated into Section 3.4 of Appendix A.

Comments:		**Response:**
39.	**Section 3.2, page A-20**: Please add DL-PCB congener and mercury analysis to the analyte list.	The list of dioxin-like PCBs (DL-PCBs) and mercury were added to the analyte list with the exception of passive sampling where only the DL-PCBs were added to the analyte list.
40.	**Section 3-3, page A-21**: Concentration of PCBs in unfiltered surface water samples will be used to measure compliance with State and Federal WQC.	Section 3.3 of Appendix A has been updated to reflect that the unfiltered surface water sample results can be used for comparison with the applicable state and federal ambient water quality criteria (AWQC).
41.	**Section 3-3, page A-21**: Please describe how the dissolved surface water sample data for PCBs will be used. Indicate the question/decision that the dissolved surface water samples will be used to answer/inform.	Section 3.3 of Appendix A has been updated to provide details on how the dissolved-phase surface water sample data for PCBs will be used. The dissolved-phase PCB results from the passive sampling program for surface water and porewater will be used to assess PCB bioavailability. These data, in combination with the fish tracking results, will be useful for understanding the long-term distribution and time-based concentration trends for PCB in fish. This information is crucial to understanding long-term remedy performance.
42.	**Section 3.4, page A-22**: “The fish will be processed as skin-off fillets and analyzed for PCB Aroclors, PCB homologs, mercury, and percent lipids.” The bulleted list above this sentence indicates both fillets and whole-body fish will be collected. Please revise this sentence to indicate that whole-body fish samples will also be submitted for analysis. Please add DL-PCB congener analysis to the list of analytes.	Section 3.4 of Appendix A has been updated to reflect that all fish samples collected (skin-off fillets and whole-body samples) will be analyzed for PCB Aroclors, PCB homologs, DL-PCBs, mercury, and percent lipids.

Comments:		Response:
Comments Appendix B – Proposed Long-Term Monitoring		
43.	**Introduction, Appendix B Section 1 page B-1**: Strongly agree with collecting baseline samples prior to beginning remedial activities. It is important to collect baseline fish tissue samples; this will allow evaluation of whether remedial activities result in an increase in fish tissue concentrations. Suggest revising to indicate that the increased concentrations in sediment and fish are expected to be transient, highest following remedy implementation, but decreasing with time.	Section 1 of Appendix B has been updated to reflect that increases in PCB concentrations for fish and sediment PCB above baseline (conditions prior to remediation) are expected during and following the implementation of remedial activities and that these elevated PCB concentrations are expected to decline over time.
44.	**Introduction, Appendix B Section 1, page B-2:** Are Stations 33 and 34 sufficiently far from the confluence to truly represent background conditions? Logan Martin Lake is managed as a "storage" reservoir (https://apcshorelines.com/lake/logan-martin/) and will have extended time periods where water will not be released (i.e., there will be no flow). Has the upstream distance in the Coosa River needed to be outside the influence of Choccolocco Creek been identified? If not, it should be delineated before reference locations are selected.	The average annual flow rate for the Coosa River through the Lake Logan Martin Reservoir is 18 times higher than the corresponding flow rate for Choccolocco Creek (13,000 cubic feet per second [cfs] and 715 cfs, respectively). The differences in flow rates makes it difficult for waters from Choccolocco Creek to flow upstream against the flow of the Coosa River even though Lake Logan Martin is a dam-controlled reservoir. To account for this and upstream background conditions for historical PCB sources not associated with the Anniston PCB Site, the two upstream locations identified in the long-term monitoring plan, Stations 33 and 34, are situated well upstream of the Coosa River–Choccolocco Creek confluence (4 miles and 2 miles, respectively). The special studies described in Appendix A have been revised to provide information regarding upstream conditions for Lake Logan Martin as samples will be collected from several stations leading up to the Neely Henry Dam. In terms on the varying water levels for Lake Logan Martin Reservoir, the historical operating levels for 8 months of the year are at an elevation of 465 feet above sea level. The winter pool elevation for the 4 months of December through March is 3 to 5 feet lower. Even with these varying water surface elevations, waters are being released at the Logan Matin Dam throughout the entire year as part of operating the turbines that generate electricity. As the waters are released at the dam, this results in a downstream flow gradient that limits the potential for water from Choccolocco Creek to flow upstream against the natural flow of the Coosa River through the Lake Logan Martin reservoir.

Comments:		Response:
45.	**Section 1, Page B-2:** Please indicate the question/decision that the dissolved surface water samples will be used to answer/inform.	Please see response to comment number 41.
46.	**Section 2, page B-3**: The PCB RGO of 27.3 mg/kg dw shown on Table 6-5 was not identified as an RGO in the BERA Addendum. Please remove this value from Table 6-5 and all discussion of the whole-body PRG range. This concentration (27.3 mg/kg dw) should not be used as a metric to assess performance of the OU-4 remedy.	Please see response to comment number 23.
47.	**Section 2, page B-3**: The backwater area is accessible to ecological receptors; whole-body fish samples should be collected at this location.	The proposed sampling program has been updated to include the collection of whole-body fish samples from the backwater area (i.e., BW-01).
48.	**Section 2, page B-4**: Based on fate and transport mechanisms described in the FS and BERA, measurement of PCBs in unfiltered samples is needed to evaluate remedy effectiveness. Please indicate the decisions the dissolved surface water data will be used to inform.	Please see response to comment number 41.
49.	**Sediment Sampling, Section 2.1, page B-4**: Please add DL-PCB congener and mercury analyses to the list of analytes.	The analysis of DL-like PCB congeners has been added to the analyte list.
50.	**Section 2.4, page B-7**: "The fish will be processed as skin-off fillets and analyzed for PCB Aroclors, PCB homologs, mercury, and percent lipids." Please add DL-PCB congener analysis to the list of analytes. If methylmercury analysis is not performed, it will be assumed that mercury in fish is 100% methylmercury.	The analysis of DL-like PCB congeners has been added to the analyte list. The fish tissue samples are not planned to undergo analysis for methylmercury, and it's reasonable to assume that mercury measured in fish is methylmercury.

Comments:		**Response:**
51.	**Section 2.5, page B-7: Fish Tracking:** What is the question being answered by the proposed study, and how will these data be used to evaluate remedy effectiveness? Please expand the below discussion: Please add the information provided on Page B-13 to this section: "The fish tracking study results are critical to this evaluation because the simplifying assumption that fish are being exposed by local conditions may not be accurate and could lead to an incorrect assessment of remedy performance."	The discussion regarding the proposed fish tracking on page B-7 has been expanded to clarify that… "*The fish tracking study results are critical to this evaluation because the simplifying assumption that fish are being exposed by local conditions may not be accurate and could lead to an incorrect assessment of remedy performance*."
52.	**Section 2.6, page B-8**: "the remedial design (RD) process will identify additional areas for focused monitoring based on their location being upstream of river mile (RM) 29.5 and the potential for lateral movement of the creek channel into these creek bank areas." The proposed PRG for floodplain soil is higher than the PRG for sediment. The floodplain areas with higher cleanup goals may act as a source to Choccolocco Creek sediment if the creek channel moves and floodplain soil erodes. Additional discussion should be added that describes the likelihood of a significant erosion event that transports floodplain soils into Choccolocco Creek along with a description of how this addition of floodplain soils may affect PCB concentrations in sediment.	Additional text has been included in the Channel Migration Zone (CMZ) approach described on pages B-8 and B-9 to further highlight that the CMZ evaluation will be designed to identify creek bank areas that might become vulnerable over time, including the potential effects of significant erosion events.

Comments:		Response:
53.	**Section 5, page B-13**: "The dissolved-phase PCB results as calculated from the PE will also be valuable for comparisons with the ambient water quality criteria as part of assessing remedy performance." The EPA and ADEM WQC for PCBs are based on total PCBs. The dissolved-phase PCB results will not indicate whether surface water remedial goals are met. Unfiltered surface water sample results are needed to evaluate this metric. Please indicate the question/decision the dissolved surface water results will be used to answer/inform.	Please see response to comment number 41.

References:

Custer, C.M., T.W. Custer, P.D. Allen, K.L. Stromborg, and M.J. Melancon. 1998. Reproduction and environmental contamination in tree swallows nesting in the Fox River drainage and Green Bay, Wisconsin, USA. Environmental Toxicology and Chemistry 17(9):1786–1798.

Custer, C.M., T.W. Custer, P.M. Dummer, and K.L. Munney. 2003. Exposure and effects of chemical contaminants on tree swallows nesting along the Housatonic River, Berkshire County, Massachusetts, USA, 1998–2000. Environmental Toxicology and Chemistry 22(7):1605–1621.

Henning, M.H., S.K. Robinson, K.J. McKay, J.P. Sullivan, and H. Bruckert. 2003. Productivity of American robins exposed to polychlorinated biphenyls, Housatonic River, Massachusetts, USA. Environmental Toxicology and Chemistry 22(11):2783–2788.