AGENCY REVIEW COMMENTS ON THE DRAFT TIER 2 REMEDIAL INVESTIGATION REPORT
DEVIL'S SWAMP LAKE SITE
CERCLA DOCKET NO. 06-04-10, LDEQ AI No. 86800, EPA ID LAD981155872
EAST BATON ROUGE PARISH, LOUISIANA
JULY 2015

Item No.	*Reference*	*Comment*	*Response*
LDEQ – USTRD: Technical Comments provided to Mr. John Arbuthnot of Clean Harbors in a letter dated March 5, 2015			
1	Section 8.6.1.2	A reference was not provided for the ecological exposure models and parameter values used in the ecological assessment therefore they could not be verified.	The reference for the exposure model (Equation 8.1) is Section 4 of the Wildlife Exposure Handbook, Volume 1 (USEPA 1993). The citation for this document will be added to the References in Section 12. The Wildlife Scenario Builder (USEPA 2013a) is the reference for input parameters, which is cited in the document. The details on the selection of input parameters are provided in the footnotes of Table 8-2.
2	Section 8.0	The Fuchsman et al 2008 and Neigh et al 2006 references were frequently cited in the ecological assessment, however, these papers were not readily available on the internet and therefore the inputs obtained from these references could not be verified.	Fuchsman et al. (2008) and Neigh et al. (2006) are copyrighted materials published in the peer-reviewed literature and available for purchase from the publishers. For convenience, they are provided with this response to comments.
3	Page 51 and Table 8-5	Equation 8.12 appears to be incorrect; solving for C_{biota} from the BSAF equation would yield C_{biota}=BSAF x F_1 x (C_s/f_{oc})	The Equation 8.12 (as presented in the report) is a typo. The correct equation (as identified in the comment) was used for all calculations. The equation will be corrected in the text of the revised Tier 2 RI Report.
4	Page 52	Based on the references cited, the avian TEF for PCB 189 is 1.0E-5 not 1.0E-04; the mammalian TEF for PCB 156/157 and PCB 167 is 3.0E-05 not 3.0E-04	The TEFs identified in the comment are correct. The inconsistent values on Page 52 are typos and will be corrected. The correct values were used in all calculations.
5	Section 9.4.3.2	The RME intake assumption is that a fish meal would consist of 40 g/meal (1.4 oz) of fish and that a crawfish meal would consist of 32 g/meal (1.1 oz) of crawfish. These assumptions are significantly lower than the meal size generally assumed for seafood of 227 g or 8 oz. There is a similar concern for the CTE assumption that a meal of fish or crawfish would consist of 10 g (0.35 oz) of fish or crawfish. It should be noted that the approved Tier 2 Remedial Investigation (RI) Work Plan that was cited in the report presented proposed ingestion rates of 40 g/day of fish and 32 g/day of crawfish. EPA RAGS-A states a frequency of 365 days/yr.	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal size of 227 g/meal for each species of fish and crawfish [(227 g/meal x 48 meals/year)/(365 days/year) = 30 g/day for each species of fish and crawfish]. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
6	Tables 9-3 and 9-4, 9-5, 9-6	Clarify why non-detect results were treated as zero or 1/2 detection limit. These approaches are not consistent with current statistical recommendations for calculating exposure concentrations.	To prevent unnecessarily high biasing the concentration for Aroclors analyzed via SW-846 Method 8082, which measures total PCBs as Aroclors and assigns the detectable concentration to individual Aroclor(s), non-detect Aroclors were treated as zero on Table 9-3. For dioxin like PCBs analyzed via SW-846 Method 1668, which measures individual congeners, non-detect congeners were treated as 1/2 of the detection limit consistent with the recommendations in USEPA Region 3 Guidance on Handling Chemical Concentration Data Near the Detection Limit in Risk Assessments (December 2014). The revised Tier 2 RI report will include the above clarification.
7	Tables 9-7 and 9-8	Current RME recommendation for residential ED is 26 years not 24 years.	A Site-specific modification from the default parameter value was implemented since children of age 0 to 2 are unlikely to directly ingest fish and/or crawfish at such a young age. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested residential ED of 26 years. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.

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8	Table 9-9	It is stated that the ingestion rate and meal frequency were selected based on Site-specific considerations. Clarify why it is assumed that only 50% of the fish ingested is obtained from Devil Swamp for the RME.	Devil's Swamp Lake is not the only source of fish for local anglers. The 1999 EPA HHRA included the use of area-specific values for the fraction of consumed fish over a lifetime that were obtained from the Site of 0.5 for the bayou, channel, and swamp areas based on limited accessibility. Clean Harbors considers that the entire Site, including the lake, is difficult to access based on the Mississippi River stage, Site conditions, and private property ownership. The assumption that 50% of the ingested fish may be from Devil's Swamp Lake is considered sufficiently conservative. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested FI of 100% (1). These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
LDEQ Comments regarding Exposure Assumptions			
1		Ingestion Rate: -The Devil Swamp Lake assessment assumes 40 g/meal (1.4 oz/meal) for fish and 32 g/meal (1.1 oz/meal) for crawfish. The fish ingestion rate of 40 g/meal is further subdivided into 8 g (0.3 oz) of bass and 32 grams of catfish (1.1 oz) -The state advisory protocol assumes 227 g/meal (8 oz/meal) with each meal consisting of a single species of fish. This ingestion rate equates to 30 g/day for 365 days/year	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal size of 227 g/meal for each species of fish and crawfish [(227 g/meal x 48 meals/year)/(365 days/year) = 30 g/day for each species of fish and crawfish]. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
2		Frequency of Ingestion: - The Devil Swamp Lake assessment assumes a fish ingestion frequency of 2 meals/month. - The state advisory protocol assumes 4 meals/month	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal frequency of 4 meals/month or 48 meals/year. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
3		Fraction ingested from the contaminated source: - The Devil Swamp Lake assessment assumes that only 50% of fish ingested is from the contaminated source (i.e., from Devil's Swamp Lake)	Devil's Swamp Lake is not the only source of fish for local anglers. The 1999 EPA HHRA included the use of area-specific values for the fraction of consumed fish over a lifetime that were obtained from the Site of 0.5 for the bayou, channel, and swamp areas based on limited accessibility. Clean Harbors considers that the entire Site, including the lake, is difficult to access based on the Mississippi River stage, Site conditions, and private property ownership. The assumption that 50% of the ingested fish may be from Devil's Swamp Lake is considered sufficiently conservative. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested FI of 100% (1). These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.

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4		Reduction in PCB concentration due to cooking: - The Devil Swamp Lake assessment assumes that the concentration of PCBs in the fish fillet is decreased by 30% due to cooking. - The state advisory protocol assumes 0% reduction in concentration due to cooking.	Table 1 (Page 28) of the *Louisiana Protocol for Issuing Public Health Advisories for Chemical Contamination in Recreationally Caught Fish and Shellfish* lists alternate assumptions, including values for Food Preparation and Cooking Reduction. These values were used in this assessment, and are supported by additional EPA (2000) documentation (G*uidance for Assessing Chemical Contaminant Data for Use in Fish Advisories: Vol 1. Fish Sampling and Analysis and Vol. 2 Risk Assessment and Fish Consumption Levels (3rd Ed.) 823-B-00-007, Office of Science and Technology: Office of Water, U.S. Environmental Protection Agency, Washington DC, November 2000*). However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested cooking reduction factor of 1. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
5		Estimation of the PCB concentration in edible tissue: -The Devil Swamp Lake assessment uses the 95%UCL-AM concentration. -The state advisory protocol uses the mean concentration.	Consistent with the June 2012 *EPA-approved Final Tier 2 Remedial Investigation Work Plan* and with USEPA guidance for a baseline risk assessment, the 95% UCL on the mean was used to estimate the exposure point concentration (EPC) (USEPA RAGS Part A, 1989). The LDEQ-requested EPC would be slightly lower than the values used in the Tier 2 RI, but would be inconsistent with USEPA recommendations for estimating risks for a reasonable maximum exposure. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested use of arithmetic means. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
6		Exposure Duration and body weight: - The Devil Swamp Lake Assessment uses an exposure duration of 20 years; the state advisory protocol uses 30 years. - The Devil Swamp Lake Assessment uses a body weight of 80 kg; the state advisory protocol uses 70 kg.	The value listed in Table 9-9 includes a 20-year exposure duration for an adult receptor. A child receptor is listed with a 4-year exposure duration, resulting in a total exposure duration of 24 years. In 2014, EPA published updated exposure parameters (*Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 2014*). These new parameters recommend a residential exposure period of 26 years, whereas the previous recommendation was 30 years. As the 0-2 year old receptor is excluded from the analysis as mentioned previously, 24 years is considered to accurately reflect the current EPA recommendations. The body weight of 80 kg also reflects the updated EPA parameters. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested exposure duration of 30 years and a body weight of 70 kg. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
EPA General Comments (dated April 8, 2015)			
1	Executive Summary, page ii	Note that the EPA risk threshold of further action (TFA) is 1E-4… (this isn't totally correct or a discrete point) - Action is generally warranted at a site where cumulative site risk exceeds the 1 x 10 E-4, <u>but action may be warranted at sites posing risk within the 1 x 10E-4 to 1 x 10E-06 risk range</u>. This is the "target range" within which the Agency strives to manage risks as part of a Superfund cleanup. The 1 x10E-06 is the "point of departure" for determining remediation goals when ARARs are not available or are not sufficiently protective, pursuant to NCP section 300.43(e) (2) (I). Replace all references in pages ii, iii, to a TFA or trigger of 1E-6.	The revised report will clarify that USEPA's target range for risk management decisions is 10-6 to 10-4 and that 10-4 is generally used to make risk management decisions, per OSWER Directive 9355.0-30.

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2	Executive Summary, page iii	Risk numbers, "acceptable risk range" and trigger levels. Revise as per new calculate risk numbers and refer to the "risk management range of 1E-06 to 1E-4. **There is no acceptable risk range of 1E-6 to 1E-4.**	The revised report will clarify that USEPA's target range for risk management decisions is 10-6 to 10-4 and that 10-4 is generally used to make risk management decisions, per OSWER Directive 9355.0-30.
3	Page 8	There are two USEPA (1997s) in the Reference section (page 91) which need differentiation.	The two USEPA 1997 references will be corrected in the Reference Section and distinguished where applicable in the report text.
4	Page 10	Identifies the Louisiana Department of Health and Hospitals (LDHH) Protocol for Issuing Public health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish as an ARAR potentially applicable to this Site. Assumptions used to calculate human health risk levels need to be revised to include consideration of this protocol. See Specific Comments that follow.	Noted and separate risk tables that include the requested LDEQ input parameters have been created as requested. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
EPA General Comments of the Baseline Ecological Risk Assessment Technical Review Comments (dated April 8, 2015)			
1	Section 8	The BERA is well written, relatively complete, and generally follows EPA Guidance for a BERA.	Clean Harbors appreciates the comment. No response necessary.
2	Section 8 and Appendix F	Minimal errors were found for references in not only the BERA Chapter (Chapter 8) but also in Appendix F-Selection of Exposure Parameters for Indicator Species. Any issues found are noted in the Specific Comments that follow.	All references will be checked and corrected in the revised Tier 2 RI Report.
EPA Specific Comments of the Baseline Ecological Risk Assessment Technical Review Comments (dated April 8, 2015)			
1	Page 39, first bullet	"Inclusion of South Baton Rouge as an additional AOC," recommend addition of the words "as shown in Figure 3-1"	The requested revision will be made to the first bullet on Page 39.
2	Page 42, Section 8.6.1.2	A reference was not provided for the ecological exposure models and parameter values used in the ecological assessment therefore they could not be verified (LDEQ-1).	The reference for the exposure model (Equation 8.1) is Section 4 of the Wildlife Exposure Handbook, Volume 1 (USEPA 1993). The Wildlife Scenario Builder (USEPA 2013a) is the reference for input parameters, which is cited in the document. The details on the selection of input parameters are provided in the footnotes of Table 8-2.
3	Page 43	The Fuchsman et al 2008 and Neigh et al 2006 references were frequently cited in the ecological assessment, however, these papers were not readily available on the internet and therefore the inputs obtained from these references could not be verified (LDEQ-2a).	Fuchsman et al. (2008) and Neigh et al. (2006) are copyrighted materials published in the peer-reviewed literature and available for purchase from the publishers. For convenience, they are provided with this response to comments.
4	Page 43, Dose Based Exposure Models	Table 8-2 includes the foraging range for the receptors of concern; however, these were not used in dose equations or presented in these equations. Recommend adding a sentence in the exposure parameter section that notes that while the foraging range has been included in Table 8-2, it is assumed the receptors are exposed 100% of the time for the food-webs.	A sentence will be added to Section 8.6.1.3 stating that area use for all indicator species is assumed to be to 100%.

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5	Page 47	Neigh et al 2006 references were frequently cited in the ecological assessment, however, these papers were not readily available on the internet and therefore the inputs obtained from these references could not be verified (LDEQ-2b).	Neigh et al. (2006) is copyrighted material published in the peer-reviewed literature and available for purchase from the publishers. For convenience, it is provided with this response to comments.
6	Page 47, Section 8.6.1.4, last paragraph	"Table 8-4C identifies values for 50 percent lethal concentrations (LC50s), no observed effect concentrations (NOECs), and lowest observed effect concentrations (LOECs) for several species of fish including channel catfish." This does not explain what the bolded "TRV" is in this table, and why it is invariably larger than any of the other TRVs shown in this table. Is this due to the normalization to 4.8% lipid? If so this needs explanation.	The Toxicity Reference Values (TRVs) in bold font in the bottom row of Table 8-4C are values for Channel Catfish normalized to 4.8% lipid (from Elonen et al., 1998). TRVs for individual fish species are unadjusted values reported by Elonen et al. (1998). These notes will be added to Table 8-4C for clarification.
7	Page 49, last paragraph	"The TRVs identified in Table 8-4C are normalized to 4.8 percent lipid for channel catfish (Elonen, et. Al., 1998)." As noted above, please provide the derivation of these TRVs.	The discussion of TRVs for whole body fish concentrations will be expanded to clarify the derivation of the TRVs.
8	Page 50, in reference to Area-weighted EPCs	The forage area is throughout the entire Devil's Swamp Lake. Fish are contained mostly in the North Devil's Swamp, North Devil's Swamp Lake, and South Devil's Swamp Lake. It is more appropriate to have separate EPCs, to rule out the AOIs where there are no fish presenting an unacceptable risk.	The SLERA and Step 3 Problem Formulation Report evaluated risk to avian and mammalian wildlife for each AOI. As requested by USEPA, LDEQ, and US Fish and Wildlife Service during a meeting in November 2011, the food chain models for the BERA were based on the assumption that avian and mammalian wildlife forage throughout the entire assessment area. Although wildlife foraging in the assessment area do not recognize the boundaries of the AOIs, they do forage in areas where prey is available. Therefore, the suggestion that fish are available only in areas of open water habitat (North-Central Devil's Swamp, North Devil's Swamp Lake, and South Devil's Swamp Lake) is reasonable. The EPCs for fish are based on chemical analysis of fish collected from Devil's Swamp Lake. It is assumed that the tissue analysis integrates exposure over the open water habitats in North-Central Devil's Swamp, North Devil's Swamp Lake and South Devil's Swamp Lake. As the diets of all indicator species include prey items other than fish, receptors are likely exposed to all AOIs, including those that do not provide open water habitat. To address this comment, incidental sediment ingestion has been partitioned into open water habitats (North-Central Devil's Swamp, North Devil's Swamp Lake, and South Devil's Swamp Lake) for the fish portion of the diet and all AOIs for the portion of the diet consisting of other aquatic and semi-aquatic prey. The text will be revised accordingly. A set of tables with the revised calculations will be included in the revised Tier 2 RI Report.
9	Page 50	Tier 2 RI AOIs are presented (page 50), add description of South Bayou Baton Rouge AOI and explain why it should or should not be considered to establish an EPC for fish. (is not a water body of 403 acres, is a smaller bayou, topography makes difficult connection between the bayou and the lake, the EPA included this AOC to define extent of contamination, etc.)	A description of South Bayou Baton Rouge will be added as requested. As addressed in the response to Comment No. 8, the food chain models have been revised such that the indicator species do not obtain fish from South Bayou Baton Rouge. The text will be revised to state that fish are only obtained for North-Central Devil's Swamp Lake, North Devil's Swamp Lake, and South Devil's Swamp Lake.

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10	Page 51 and Table 8.5	Equation 8.12 appears to be incorrect; solving for C_{biota} from the BSAF equation would yield C_{biota}=BSAF x F_1 x C_s/f_{oc} (LDEQ-3).	The Equation 8.12 (as presented in the report) is a typo and will be corrected in the text and tables where applicable. The correct equation (as identified in the comment) was used for all calculations.
11	Page 52	Based on the references cited, the avian TEF for PCB 189 is 1.0E-5 not 1.0E-04; the mammalian TEF for PCB 156/157 and PCB 167 is 3.0E-05 not 3.0E-04 (LDEQ-4).	The TEFs identified in the comment are correct. The inconsistent values on Page 52 are typos and will be corrected. The correct values were used in all calculations.
12	Page 53, Soil Total PCB, last sentence	"A value of one-half the limit of detection was assigned to the one with sample in which Aroclor-1254 was ND." This sentence is confusing; recommend, "For the sample with no detected PCBs, a value of one-half the limit of detection was used for Aroclor-1254."	The sentence will be revised as recommended in the text.
13	Page 55, Crawfish	"The co-located samples of crawfish and sediment collected in May 2014 were used to calculate site-specific BSAFs of 8.69E-02 for avian wildlife, 8.60E-02 for mammalian wildlife, and 9.0E-02 for unadjusted DLPCBs." Recommend referring Appendix A where these are documented.	A reference to Appendix A will be added to this Section of the text.
14	Page 56, first line	(CRA 2014) is also included as Appendix A. Recommend referral to the appendix instead of CRA (2014), or refer to both.	The text will be revised to reference both Appendix A and CRA 2014.
15	Page 57, Terrestrial Plants	(USEPA 2010). There are two references to USEPA (2010) in the references (page 92) which need differentiation.	The USEPA 2010 references will be edited in the text and reference section (Section 12.0) to differentiate between the two USEPA (2010) references.
16	Page 60, Section 8.7.5, first sentence	"The CTE concentrations represent the most ecologically relevant exposure scenario for mink." While this sentence may or may not be true, it is recommended that it be deleted.	The sentence will be deleted from the text of the Final Tier 2 RI Report.
EPA General Comments of the Human Health and Risk Assessment Technical Review Comments (dated April 8, 2015)			
1	Section 9	Values shown in the text (e.g. exposure factors, toxicity reference values, and cancer and non-cancer risks) match those presented in their associated tables.	Noted.
2	Section 9	There are many references in both text and tables that are not found in, or are not presented correctly in, the reference section, text, or tables. The following specific comments identify some of those location, although a complete editorial of the chapter is recommended.	The references will be corrected and the reference section will be updated.

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3	Section 9	The HHRA does not present overall cumulative risk results. Risk results for all complete exposure pathways should be summed to present cumulative risks for potential receptor exposure media at Devil's Swamp. Separate risks are presented for exposure to abiotic media (sediment and surface water) and biotic media (fish). It would be expected that these risks from exposure to both types of media are concurrent; consequently, total cancer and non-cancer risks to the recreational fisher from both abiotic and biotic media should be presented.	USEPA risk assessment guidance RAGS Part A (in Section 6.1.2 and Section 8.3) and RAGS Part E (in Section 3.2.2.3) includes language that indicates that combining the RME risks for individual exposure pathways would likely result in exceeding the overall RME risk for a receptor. The basis for the presumption is that it is unlikely in real-world situations that a single individual would consistently face all the RME risks from multiple pathways at the same time, given the conservatism that USEPA expects (and requires) in the RME risks for the individual pathways. The guidance says that a departure from this presumption warrants a specific basis for combining risks across pathways. Cumulative risks and hazards are calculated where appropriate. For example, Tables 9-10 and 9-11 sum risks and hazards from the ingestion and dermal exposure routes for each medium. Risks and hazards for sediment and water are not summed given that exposures to water and sediment may not occur at the same time. Namely, exposed skin is assumed to be contacted by either water or sediment, not both over the same area. Risks and hazards associated with fish and crawfish ingestion were not summed with those for the abiotic media (sediment and surface water) given the screening-level HHRA showed that all constituent concentrations in sediment were below the screening criteria, and that all constituent concentrations in surface water were below screening criteria except for surface water in the Drainage Ditch, but the ditch does not support fish or crawfish fishery. Therefore, the tables quantify risks and hazards for those pathways and routes that reflect Site conditions.

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4	Exposure Factors (Table 9-9)	a. Table 9-9 (Human Health Exposure Assumptions) indicates that a "Cooking Reduction Factor (CF) of 0.5 and 0.7 for CTE and RME respectively have been applied to exposure calculations for fish and shellfish consistent with LDEQ and EPA rationale." However, while these reductions are shown as "alternate" values in LDEQ, the LDEQ assumptions are 0 (no reduction). Further, the other citation (EPA 2000) provided in support of these cooking reduction factors states, "EPA recommends the use of dose modification factors for setting health-based intake limits only when data on local methods of preparation and their impact on contaminant concentrations are available." In Table 9-9, footnote 4 cites three papers supporting the CFs used. Two of these papers have been examined and have been found to be inconsistent with the statement. Zabik and Zabik (1995) examined TCDD reduction, and found varying levels of reductions in TCDD equivalents. Schere et.al. (1998) reported a reduction 33% for TCDD, TCDF, and PCB coplanar congeners. Neither of these papers definitively supports the application of any CF. Application of the CFs, consequently, is not consistent with the guidance cited and not definitively supported by the cited literature. Cooking reduction should be 0%.	Table 1 (Page 28) of the Louisiana Protocol for Issuing Public Health Advisories for Chemical Contamination in Recreationally Caught Fish and Shellfish lists alternate assumptions, including values for Food Preparation and Cooking Reduction. These values were used in this assessment, and are supported by additional EPA (2000) documentation (Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories: Vol. 2 Risk Assessment and Fish Consumption Levels (3rd Ed.) 823-B-00-007, Office of Science and Technology: Office of Water, U.S. Environmental Protection Agency, Washington DC, November 2000). As reported in Table 1 C-1 through C-3 of the EPA (2000) document, levels of constituents, including PCBs, decrease as a results of various cooking and preparation methods. In Table C-1 (page C-23), note that for bass, the reductions in concentrations of PCBs range from 16 to 74% (mean of 45%, or factor of 0.5, similar to the value used in CTE). In Table C-3, overage PCB reductions in Great Lakes fish are 30.3% (or a factor of 0.7, similar to the value used in RME). Clean Harbors believes that the application of a cooking reduction factor is appropriate. The DSL Tier 2 RI risk assessment tables for the purpose of risk management will continue to propose the use of a cooking reduction factor of 50% (0.5 for the CTE scenario) and 30% (0.7 for the RME scenario). Research confirms that fish preparation and cooking methods can reduce the amount of organic chemicals, including PCBs, in fish. For example, skinning filets removes significant amounts of organic contaminants due to their bioaccumulation in fat-rich skin (Hora 1981; Sanders and Haynes 1988; Zabik et al., 1995a; Zabik and Zabik, 1996). Different cooking methods can result in different degrees of contaminant loss. For example, increasing the cooking temperature and internal temperature, increasing surface area for cooking, and increasing cooking time enhances contaminant loss (Zabik and Zabik, 1996; Zabik et al., 1996). Cooking methods that allow the separation of muscle from skin (e.g., pan frying, broiling, baking) also reduce the amount of chemical contaminants ingested compared to methods that cook both the muscle and skin (e.g., deep frying) (Zabik, 1995b). Overall, preparation and cooking methods can reduce the amount of organic chemicals in fish by over 50%, though this is dependent upon the fat content of the fish species (Sherer and Price, 1993; Wilson et al., 1998; USEPA, 2000). Specifically, PCB levels in fish can be reduced by 30% due to cooking (Sherer and Price, 1993; Zabik et al., 1994). The state of California recommends using the Cooking Reduction Factor of 0.7 to more accurately reflect chemical exposure after preparation and cooking (Klasing and Brodberg, 2008). Thus, a cooking reduction factor of 0.7 (corresponding to a 30% reduction of PCBs in fish) is reasonable to apply to the RME calculations in this HHRA.

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4 (cont.)	Exposure Factors (Table 9-9)	b. The fish consumption rates shown on Table 9-9 appear to underestimate the ingestion rate of fish or crawfish per meal. For instance, the consumption rate of 8 grams/meal (0.017 pound/meal) for a largemouth bass is not an appropriate rate for consumption of largemouth bass during a meal. It is recommended that consumption rates not be used for the determination of potential risks from ingestion of fish and crawfish from Devil's Swamp. The determination of potential risk concerns should be based on a portion size per meal. A portion size per meal of 8 ounces is typically recommended for an adult male (EPA 2000). The references identified in Section 9.4.3.2 for the fish and crawfish consumption rates were reviewed to determine how these consumption rates were calculated. Katner, et al., 2011 only provides estimated sport fish meals per month and does not discuss actual consumption rates. Lincoln, et al., 2011 does present an average daily consumption rate. However, this daily consumption rate was determined by multiplying the number of meals per year by apportion size of 129 grams and then dividing by the total grams of fish consumed per year by 365 days per year. EPA RAGS a Guidance (1989) notes, "Daily intake values should be used in conjunction with an exposure frequency of 365 days/year (Exhibit 6-17)." The exposure frequency for Devil's Swamp is specific to recreational activities to recreational activities that are expected to occur at the site and are not averaged over 365 days per year. As a result, the use of the daily consumption rate would result in an underestimate of fish intake for recreational fishers at Devil's Swamp. The fish consumption rate as presented under the Louisiana Protocol for Issuing Public health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish (dated February 2012), recommends 227 g per meal and 4 meals/month. The current default assumption factor for food preparation and cooking reduction is 1 or 100%.	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal size of 227 g/meal for each species of fish and shellfish and the requested meal frequency of 4 meals/month or 48 meals/year [(227 g/meal x 48 meals/year)/(365 days/year) = 30 g/day for each species of fish and crawfish]. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report. The DSL Tier 2 RI risk assessment tables will propose the use of a total meal size of 227 g/meal (Bass=45.36 g/meal; Catfish=90.72 g/meal; Crawfish=90.72 g/meal) and a meal frequency of 2 meals/month or 24 meals/year for the RME scenario. Clean Harbors believes that the application of a cooking reduction factor is appropriate.
		c. The use of an FI (Contaminated Fraction Ingested) of 0.5 is not appropriate for assessing the risks from fish within Devil's Swamp. As noted above, the determination of potential health concerns for fish ingestion should be based upon a portion size and not a daily fish consumption rate. Therefore, the resulting intake for fish is specific to the amount of fish consumed from Devil's Swamp. Based upon fish and crawfish samples results, site-specific COPCs were detected in all fish and crawfish samples. Therefore, the FI for fish from Devil's Swamp is 1 or 100%.	Devil's Swamp Lake is not the only source of fish for local anglers. The 1999 EPA HHRA included the use of area-specific values for the fraction of consumed fish over a lifetime that were obtained from the Site of 0.5 for the bayou, channel, and swamp areas based on limited accessibility. Clean Harbors considers that the entire Site, including the lake, is difficult to access based on the Mississippi River stage, Site conditions, and private property ownership. The assumption that 50% of the ingested fish may be from Devil's Swamp Lake is considered sufficiently conservative. Therefore, Clean Harbors believes that a FI of 50% (0.5) is reasonable for the entire Site based on the 1999 EPA HHRA assumptions and propose the use of a FI of 50% (0.5) in the DSL Tier 2 RI risk assessment tables for both the RME and CTE scenarios.
5	Dose Calculations (Tables 9-10 through 9-21)	a. No detailed dose calculation tables have been presented similar to RAGs D Table 7s. Presentation of such tables, even if included as an appendix, would assure that the reader could reproduce the doses presented on these tables.	The dose calculation tables will be added to the revised report.
		b. The intakes presented on these tables are difficult to reproduce. It is not clear if the use of "ABS" parameter was a factor for sediment ingestion intakes. Table 9-8 identifies the dermal "ABS" factor in the equation for the calculation of sediment ingestion intake, which is not correct.	The parameter names will be revised with the following clarification. To clarify, a Gastrointestinal Absorption Factor (GIABS) of 1 was used for the ingestion route and an ABS factor of 0.14 for the dermal route as indicated in Table 9-8 footnote and Table 9-12. Specifically, the sediment dermal route ABS value originated in Exhibit 3-4 of USEPA (2004).

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EPA Specific Comments of the Human Health Risk Assessment Technical Review Comments (dated April 8, 2015)			
1	Page 71	The frequency of eating fish was set to two meals per month, the current advisory number. Need to use non advisory numbers. As an example, a 40 g/day ingestion rate translates to over five 8-ounce meals per month and a default 54 g/day translates to over seven 9-ounce meals per month. Also see other related comments in reference to assumptions.	The ingestion frequency of 1 to 2 meals per month is based on Site-specific information. A USFWS (2011) survey of recreational fishing in Louisiana indicates that an angler may, on average, spend 22 days per year on this activity (approximately 2 days per month). This parameter is deemed appropriate and more representative of Site conditions than the default values. The DSL Tier 2 RI risk assessment tables will propose the use of a total meal size of 227 g/meal (Bass=45.36 g/meal; Catfish=90.72 g/meal; Crawfish=90.72 g/meal) and a meal frequency of 2 meals/month or 24 meals/year for the RME scenario.
2	Page 72, second paragraph, second sentence	USEPA 2003c is not listed in the Reference section.	The reference will be corrected and the reference section will be updated.
3	Page 72, third paragraph, third sentence	USEPA 1997 is not the correct citation for the TCDD CSF. HEAST (the current citation) has 1.5 E+5, not 1.3 E+5. The correct citation should the CalEPA, which does have the CSF used and is based on more current toxicity data.	CSF of 1.3E+5 was used in the risk calculations and the citation on Table 9-1 will be revised to list USEPA (2009), which contains the CalEPA source.
4	Page 72, third paragraph, third sentence	For USEPA 2014, it is assumed that is actually 2014c.	The reference will be corrected and the reference section will be updated.
5	Page 73, Section 9.4.2, end first paragraph	Include in the appendix the proUCL input files that show how NDs are considered. (Input table is an Excel table with columns showing variable names (Header Name), numerical data, and indicator of nondetects,	ProUCL input data that shows how NDs were considered will be provided in the revised Tier 2 RI report.
6	Page 74, third paragraph, last sentence	"Tables 9-6A and 9-6B show the area-weighted EPCs for crawfish that were calculated using acreages of each AOI (see Section 8.6.1.5)." The crawfish EPCs were based site-specific BASFs, and the calculations of the EPCs for both CTE and RME are shown in Attachment C of Appendix A. A clearer statement regarding how crawfish EPCs were calculated would be beneficial. Section 8.6.1.5 is long and addresses a whole host of exposure concentrations well beyond crawfish. Referral to this section was confusing and did not allow the reader to clearly understand that BSAFs were used. Some additional language regarding this is recommended, possibly with referral to Attachment C of Appendix A. (OK to use the area-weighted EPA, but show in Tables 9-6A and 9-6B the individual AOC EPCs.)	Unlike catfish and bass, which are mobile and move freely throughout open water habitats, crawfish are relatively sessile and are not expected to move among AOIs. To account for the limited movement of crawfish and the potential for exposure of human receptors to crawfish in all AOIs, EPCs for crawfish were calculated on an area weighted basis. The area weighted EPCs were calculated using the methodology described in Section 8.6.1.5. Development of BSAFs for the individual AOIs is discussed in Attachment C of Appendix A. Concentrations in crawfish for the individual AOIs were calculated using Equation 8.12. The areas of the individual AOIs are identified in the Overview for Section 8.6.1.5. Area weighted concentrations for the site wide exposure scenarios were calculated using Equation 8.11. The resulting EPCs are listed in Tables 9-3 through 9-6. Text explaining the calculation of area-weighted EPCs for crawfish and development of BSAFs will be clarified in the revised Tier 2 RI Report.

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7	Page 74, Section 9.4.3	Need to consider Louisiana default values used in their Protocol for Issuing Public Health Advisories. (This was identified as an ARAR.)	Noted and separate risk tables that include the requested LDEQ input parameters have been created as requested. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
8	Page 76, Section 9.4.3.2	The RME intake assumption is that a fish meal would consist of 40g/meal (1.4 oz.) of fish and that a crawfish meal would consist of 32 g/meal (1.1 oz.) of crawfish. These assumptions are significantly lower than the meal size generally assumed for seafood of 227 g or o oz. There is a similar concern for the CTE assumption that a meal of fish or crawfish would consist of 10 g (0.35 oz.) of fish or crawfish. It should be noted that the approved tier 2 remedial investigation work plan that was cited in the report presented proposed ingestion rates of 40 g/day of fish and 32 g/day of crawfish. EPA RAGS-A states that daily intake rates for fish and shellfish should be used in conjunction with an exposure frequency of 365 day/yr (LDEQ-5).	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal size of 227 g/meal for each species of fish and crawfish [(227 g/meal x 48 meals/year)/(365 days/year) = 30 g/day for each species of fish and crawfish]. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report. The DSL Tier 2 RI risk assessment tables will propose the use of a total meal size of 227 g/meal (Bass=45.36 g/meal; Catfish=90.72 g/meal; Crawfish=90.72 g/meal) and a meal frequency of 2 meals/month or 24 meals/year for the RME scenario.
9	Page 77, first paragraph, top line	There is no USEPA (2014d) in the reference section.	The reference will be corrected and the reference section will be updated.
10	Page 77, Section 9.5.1	In all of these summaries, the total risk from consuming all species should be presented (see General Comment 3). In other words, right now separate risks are shown for catfish, bass, and crawfish; but it is possible that a person would eat all of these species over a period of time. Show total cancer and non-cancer risks from all exposures.	USEPA risk assessment guidance RAGS Part A (in Section 6.1.2 and Section 8.3) and RAGS Part E (in Section 3.2.2.3) includes language that indicates that combining the RME risks for individual exposure pathways would likely result in exceeding the overall RME risk for a receptor. The basis for the presumption is that it is unlikely in real-world situations that a single individual would consistently face all the RME risks from multiple pathways at the same time, given the conservatism that USEPA expects (and requires) in the RME risks for the individual pathways. The guidance says that a departure from this presumption warrants a specific basis for combining risks across pathways. Global summation of risks and hazards for all species would be appropriate within a total meal size of 227 g/meal from all exposures (bass, catfish, and crawfish).
11	Page 77, Section 9.5.1, Introduction	"…and recreational user over the entire Site and at each AOI are summarized in Tables 9-10 through 9-19 and discussed below." Tables 9-12 (oral and dermal ABS) and 9-13 (DAevent calculations) are included in this range, and do not include risks. These tables should be referenced elsewhere in the document.	A reference to Tables 9-12 and 9-13 will be added to the text.
12	Page 77, Section 9.5.1.1, last sentence	"…particularly give the more intermittent nature of significant water in the ditch." "give" should be "given."	The requested revision will be made to the last sentence on Page 77.

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13	Page 77, Section 9.5.1.1 RME	"With the exception of cancer risk due to surface water exposure via dermal contact, none of the ECLR or HI estimates for the wading fisher-hunter potentially exposed to surface water or sediment in the Drainage Ditch are above the lowest acceptable risk levels of 1E-6 or 1, respectively." The term "respectively" is not used appropriately; either reformat the sentence or remove "respectively". Similar comment at sections 9.5.1.2 and 9.5.1.3	The text will be revised as requested.
14	Page 78, continuation of Section 9.5.1.1 RME	"trigger of 10E-04", this isn't necessarily a trigger level, as previously indicated at the start of this document. Similar comment at Section 9.5.1.2.	The revised report will clarify that USEPA's target range for risk management decisions is 10-6 to 10-4 and that 10-4 is generally used to make risk management decisions, per OSWER Directive 9355.0-30.
15	Page 79, continuation of Section 9.5.1.3 under RME	"below the remediation trigger of 10E-4" this isn't necessarily a trigger level.	The revised report will clarify that USEPA's target range for risk management decisions is 10-6 to 10-4 and that 10-4 is generally used to make risk management decisions, per OSWER Directive 9355.0-30.
16	Page 79, Exposure Model Source of Uncertainty: Citations (USEPA, 1989; USEPA, 1997; USEPA, 2002; USEPA, 2004; USEPA, 2006a; USEPA, 2006b; USEPA, 2014)	a. USEPA 1989 should be 1989b	The reference will be corrected and the reference section will be updated.
		b. USEPA 1997 – there are two USEPA 1997s in the reference section	The reference will be corrected and the reference section will be updated.
		c. USEPA 2004 – there are two USEPA 2004s in the reference section	The reference will be corrected and the reference section will be updated.
		d. USEPA 2006a – not in references	The reference will be corrected and the reference section will be updated.
		e. USEPA 2006b – not in references	The reference will be corrected and the reference section will be updated.
		f. USEPA 2014 – a, b, or c?	The reference will be corrected and the reference section will be updated.
17	Page 80, third paragraph, third sentence	"Regardless, as shown in Tables 9-14 through 9-16, even the high-end, RME EPCs in catfish are below the FDA limit for total PCBs." Is this referencing Tables 9-14 and 9-16? The comparison to the FDA limit is not appropriate for a baseline HHRA. The FDA limit for total PCBs is set forth for edible fish tissue limits for commercial seafood, essentially seafood that will be sold in commercial settings and not the sole source of seafood products. The FDA limits are not risk-based limits but are limits that were set forth 40 years ago by the FDA. Please remove any comparisons to the FDA limits and only discuss comparisons to risk-based levels.	The use of FDA limits in fish and shellfish is an important risk communication and perception tool. Consumers can buy and consume unlimited quantities of fish with up to a total PCB concentration of 2 mg/kg. Commercially purchased seafood may be the sole source of fish and shellfish for many consumers. Like maximum contaminant levels (MCLs) for groundwater, the FDA limits are relevant commercial standards that should be discussed as a point of reference.
18	Page 83	Incorrect use of risk range 1E-06 to 1E-06 (typo).	The text will be revised to list the risk range of 1E-06 to 1E-04.

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19	Page 85	Conclusion that the Site risks do not require further evaluation contradict the risk/hazards that are calculated when LA Protocol for Fish Advisories is applied and as per EPA comments that follow.	Separate risk tables that include the requested LDEQ parameters (in accordance with the *LDHH Protocol for Issuing Public health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish*) have been created and will be provided as a separate submittal and as an appendix in the revised Tier 2 RI Report. Risk management decisions for the DSL Tier 2 RI will be based on the USEPA target range.
20	Page 88	The statement “RME risks are within the acceptable risk range and well below the remediation trigger of 1E-4” correct to “RME risk are above the trigger level of 1E-6, but within the risk management range of 1E-6 to 1E-4.”	The text will be revised as requested.
21	Page 88	Conclusion that the Site risks do not require further evaluation contradict the risk/hazards that are calculated when LA Protocol for Fish Advisories is applied and as per EPA comments that follow.	Separate risk tables that include the requested LDEQ parameters (in accordance with the *LDHH Protocol for Issuing Public Health Advisories for Chemical Contaminants in Recreationally Caught Fish and Shellfish*) have been created and will be provided as a separate submittal and as an appendix in the revised Tier 2 RI Report. Risk management decisions for the DSL Tier 2 RI will be based on the USEPA target range.
22	Table 9-1, footnote 4	This is not the correct citation for the TCDD CSF. HEAST (the current citation) has 1.5 E+5, not 1.3 E+5. The correct citation should the CalEPA, which does have the CSF you used and is based on more current toxicity data.	CSF of 1.3E+5 was used in the risk calculations and the citation on Table 9-1 will be revised to list USEPA (2009), which contains the CalEPA source.
23	Table 9-2, TEQ column	Actually these are Toxicity Equivalency Factors (TEFs) as stated in the table title, not TEQs.	The table will be revised to list Toxicity Equivalency Factors (TEFs).
24	Table 9-3	Table 9-3 presents sediment and surface water PCB Exposure Point Concentrations (EPCs) – Drainage Ditch. We may need similar tables to present EPCs at different AOIs to target what particular AOI may require action.	The screening-level HHRA showed that all constituent concentrations in sediment were below the screening criteria, and that all constituent concentrations in surface water were below screening criteria except for surface water in the Drainage Ditch. Therefore, only the Drainage Ditch was carried through for further assessment in the Baseline Human Health Risk Assessment.
25	Tables 9-3 and 9-4, 9-5, 9-6	Clarify why non-detect results were treated as zero or ½ detection limit. These approaches are not consistent with current statistical recommendations for calculating exposure concentrations (LDEQ-6).	To prevent unnecessarily high biasing the concentration for Aroclors analyzed via SW-846 Method 8082, which measures total PCBs as Aroclors and assigns the detectable concentration to individual Aroclor(s), non-detect Aroclors were treated as zero on Table 9-3. For dioxin like PCBs analyzed via SW-846 Method 1668, which measures individual congeners, non-detect congeners were treated as 1/2 of the detection limit consistent with the recommendations in USEPA Region 3 Guidance on Handling Chemical Concentration Data Near the Detection Limit in Risk Assessments (December 2014). The revised Tier 2 RI report will include the above clarification.
26	Table 9-7 and Table 9-8	Assumptions for fisher-hunter scenario. Show the value for resulting CDI factors.	The CDI factors for each scenario are shown on Tables 9-10, 9-11, and 9-14 through 9-21.

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27	Tables 9-7 and 9-8	Current RME recommendation for residential ED is 26 years not 24 years (LDEQ-7). http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf	A Site-specific modification from the default parameter value was implemented since children of age 0 to 2 are unlikely to directly ingest fish and/or crawfish at such a young age. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested residential ED of 26 years. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
28		The state advisory protocol assumes 227 g/meal (8 oz.) with each meal consisting of a single species of fish. This ingestion rate equates to 30/g day for 365 days/year (LDHH).	Separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested meal size of 227 g/meal for each species of fish and crawfish [(227 g/meal x 48 meals/year)/(365 days/year) = 30 g/day for each species of fish and crawfish]. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
29		The Devil's Swamp Lake assessment assumes a fish ingestion frequency of 2 meals/month. The state advisory protocol assumes 4 meals/month. (LDHH),	The ingestion frequency of 1 to 2 meals per month is based on Site-specific information. A USFWS (2011) survey of recreational fishing in Louisiana indicates that an angler may, on average, spend 22 days per year on this activity (approximately 2 days per month). This parameter is deemed appropriate and more representative of Site conditions than the default values. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested rate of 4 meals/month. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
30		The Devil's Swamp Lake assessment assumes that only 50% of fish ingested is from the contaminated source (i.e., from Devil's Swamp Lake) (LDHH).	Devil's Swamp Lake is not the only source of fish for local anglers. The 1999 EPA HHRA included the use of area-specific values for the fraction of consumed fish over a lifetime that were obtained from the Site of 0.5 for the bayou, channel, and swamp areas based on limited accessibility. Clean Harbors considers that the entire Site, including the lake, is difficult to access based on the Mississippi River stage, Site conditions, and private property ownership. The assumption that 50% of the ingested fish may be from Devil's Swamp Lake is considered sufficiently conservative. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested FI of 100% (1). These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.

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31		The Devil's Swamp Lake assessment assumes that the concentration of PCBs in the fish fillet is decreased by 30% due to cooking. The state advisory protocol assumes 0% reduction in concentration due to cooking (LDHH).	Table 1 (Page 28) of the Louisiana Protocol for Issuing Public Health Advisories for Chemical Contamination in Recreationally Caught Fish and Shellfish lists alternate assumptions, including values for Food Preparation and Cooking Reduction. These values were used in this assessment, and are supported by additional EPA (2000) documentation (Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories: Vol 1. Fish Sampling and Analysis and Vol. 2 Risk Assessment and Fish Consumption Levels (3rd Ed.) 823-B-00-007, Office of Science and Technology: Office of Water, U.S. Environmental Protection Agency, Washington DC, November 2000). However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested cooking reduction factor of 1. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
32		The Devil's Swamp Lake assessment uses the 95%UCL-AM concentration. The state advisory protocol uses the mean concentration (LDHH).	Consistent with the June 2012 EPA-approved Final Tier 2 Remedial Investigation Work Plan and with USEPA guidance for a baseline risk assessment, the 95% UCL on the mean was used to estimate the exposure point concentration (EPC) (USEPA RAGS Part A, 1989). The LDEQ-requested EPC would be slightly lower than the values used in the Tier 2 RI, but would be inconsistent with USEPA recommendations for estimating risks for a reasonable maximum exposure. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested use of arithmetic means. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
33		The Devil's Swamp Lake assessment uses an exposure duration of 20 years, the state advisory protocol uses 30 years (LDHH).	The value listed in Table 9-9 includes a 20-year exposure duration for an adult receptor. A child receptor is listed with a 4-year exposure duration, resulting in a total exposure duration of 24 years. In 2014, EPA published updated exposure parameters (*Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 2014*). These new parameters recommend a residential exposure period of 26 years, whereas the previous recommendation was 30 years. As the 0-2 year old receptor is excluded from the analysis as mentioned previously, 24 years is considered to accurately reflect the current EPA recommendations. However, separate risk tables that include the requested LDEQ input parameters have been created to include the requested exposure duration of 30 years. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
34		The Devil's Swamp Lake assessment uses a body weight of 80 kg; the state advisory protocol uses 70 kg (LDHH).	In 2014, EPA published updated exposure parameters (Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 2014). The body weight of 80 kg reflects the updated EPA parameters. However, separate risk tables that include the requested LDEQ input parameters have been created to include the requested body weight of 70 kg. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.

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35		Based in the above comments, it is recommended to revise the assumptions and resulting risk numbers as per the comments applicable to the Superfund risk assessment process (see comment below for recommended Superfund risk assessment assumptions) and include a separate group of tables with assumptions and resulting risk number as per the Louisiana Protocol for Issuing Public Health Advisories for Chemical Contamination in Recreationally Caught Fish and Shellfish. The Louisiana Department of Health and Hospitals (LDHH), the Louisiana Department of Wildlife and Fisheries (LDWF), and the Louisiana Department of Environmental Quality (LDEQ), will use these tables for decision making regarding the need for a fish/shellfish consumption advisory at the Devil's Swamp Lake site.	Separate risk tables that include the requested LDEQ input parameters have been created as requested. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
36	Table 9-8, Exposure Duration citation	Two EPA 2004 citations exist in the references (a and b). Please indicate which is the appropriate citation for each factor.	The references will be corrected and the reference section will be updated.
37	Table 9-8	The intake equation for sediment ingestion includes the "ABS" exposure parameter. The ABS parameter is only applicable to dermal exposures.	The parameter names will be revised with the following clarification. To clarify, a gastrointestinal absorption factor (GIABS) of 1 was used for the ingestion route and an ABS of 0.14 for the dermal route as indicated in Table 9-8 footnote and Table 9-12. Specifically, the sediment dermal route ABS value originated in Exhibit 3-4 of USEPA (2004).
38	Table 9-9	It stated that the ingestion rate and meal frequency were selected based on site-specific considerations. Clarify why it is assumed that only 50% of the fish ingested is obtained from Devil Swamp for the RME (LDEQ-8). The reference cited is the 1999 HHRA, but this report uses a rate of 100% for the lake. The 50% was assumed for areas that were more difficult to access (North Bayou, Channels, and North Swamp).	Devil's Swamp Lake is not the only source of fish for local anglers. The 1999 EPA HHRA included the use of area-specific values for the fraction of consumed fish over a lifetime that were obtained from the Site of 0.5 for the bayou, channel, and swamp areas based on limited accessibility. Clean Harbors considers that the entire Site, including the lake, is difficult to access based on the Mississippi River stage, Site conditions, and private property ownership. The assumption that 50% of the ingested fish may be from Devil's Swamp Lake is considered sufficiently conservative. However, separate risk tables that include the requested LDEQ input parameters have been created to incorporate the requested FI of 100% (1). These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report. The DSL Tier 2 RI risk assessment tables will propose the use of a FI of 50% (0.5) for the entire Site for both the CTE and RME scenarios.

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39	Table 9-9	Table 9-9, suggested Superfund risk assessment assumptions: RME values C Bass PCB = CRA RME 0.673 C Catfish PCB = CRA RME 1.129 C Bass TEF = CRA RME 2.188E-05 C Catfish TEF = CRA RME 2.221E-05 IR = Ingestion rate 40g/day approx. Adult bass = 56.7 g/meal bass (based on information provided, should be corrected to 45.36 g/meal) Adult catfish = 181.44 g/meal catfish CF = Conversion factor = 1E-04 (corrected to 1E-03 by email on May 27, 2015) MF = Meal Frequency = 24 (CRA value) FI = Fraction Ingested = 1 FI = Fraction Ingested by child (2 oz.) = .25 CR = Cooking Reduction Factor (0%) = 1 ED- Child = Exposure Duration = 4 years ED- Adult = Exposure Duration = 20 years BW-Child = Body Weight = 15 kg BW-Adult = Body Weight = 70 kg AT-C = Averaging Time (cancer) = 25,550 days AT-N = Averaging Time (non-cancer)= 8,760 days The above assumptions, considering only two fish meals per month (the current fish consumption advisory), yield the following risk values that fall within the risk management range for further remedial action. Total PCB cancer risk 1.87E-04 Bass and Catfish Total PCB non-c risk 13.6 Bass and Catfish Total TEF(DLPCB) cancer risk 2.60E-04 Bass and Catfish Total TEF(DLPCB) non-c risk 8.3 Bass and Catfish This is with the assumption of two fish meal / month of 8 oz. each, considering this is what is in the advisory, the site is difficult to reach, new fencing has been added to further restrict access, is private property. This approach is site specific. CH/CRA reported 40 g/day, that's close to 4 fish meals/month, risk numbers will not change that much. We are asking here to also do and present similar calculation using LDEQ/LDHH fish consumption advisory requirements that will require 4 meals per month and other assumptions and mean.	Clean Harbors has considered EPAs feedback, and it will be incorporated into the DSL Tier 2 RI risk assessment exposure parameters for the RME scenario. The specific changes are: 1. Clean Harbors accepts the total meal size of 227 g/meal (rounded up from 226.8 g/meal for the purpose of discussions) recommended by EPA. 2. Clean Harbors accepts EPAs recommendation on summing risks across species (specifically mentioned in EPA Comment #10, and implemented in EPA Comment #39). Therefore, risks derived for each species will be combined into total estimates for PCBs and DLPCBs within a total meal size of 227 g/meal. 3. For bass, Clean Harbors accepts EPAs underlying mathematical derivation of (8/40)*226.8 = 45.36 g bass/meal listed in EPA Comment #39. This ratio apportions the total 227 gram meal size among the species consumed. For reference, 8 g/day for bass was listed under the RME scenario in the Tier 2 RI Work Plan, as was the total ingestion rate of fish of 40 g/day (also listed in EPA Comment #39). Please note that the original EPA comments letter may have contained a typographical error of 56.7 g/meal. The remainder, 181.44 g/meal (specified in EPA Comment #39) would come from a combination of shellfish (represented by crawfish) and other species of finfish (represented by catfish). The calculated meal sizes of crawfish and catfish are explained in Items 4 and 5 below. 4. For crawfish, although not mentioned in EPA Comment #39, Clean Harbors is including this species in risk calculations, since crawfish may be consumed by local residents. To this end, Clean Harbors has implemented the value of 90.72 g crawfish/meal, or one-half of the remainder 181.44 g/meal specified in Item 3 and in EPA Comment #39. 5. For catfish, the ingestion rate was calculated as follows: 226.8 g/meal total - 45.36 g/meal for bass - 90.72 g/meal for crawfish = 90.72 g/meal for catfish to be used in risk estimates. Therefore, the RME parameters in the updated RI report will be: IR = Ingestion rate 227 g/meal total --> [Bass - 45.36 g/meal; Catfish – 90.72 g/meal; Crawfish – 90.72 g/meal] CF = Conversion factor - 1E-03 MF = Meal Frequency - 24 meals/year (2 meals/month * 12 months/year) FI = Fraction Ingested - 0.5 CR = Cooking Reduction Factor (30%) = 0.7 ED- Child = Exposure Duration - 4 years ED- Adult = Exposure Duration - 20 years BW-Child = Body Weight - 15 kg BW-Adult = Body Weight - 80 kg AT-C = Averaging Time (cancer) - 25,550 days AT-N = Averaging Time (non-cancer) - 8,760 days

AGENCY REVIEW COMMENTS ON THE DRAFT TIER 2 REMEDIAL INVESTIGATION REPORT
DEVIL'S SWAMP LAKE SITE
CERCLA DOCKET NO. 06-04-10, LDEQ AI No. 86800, EPA ID LAD981155872
EAST BATON ROUGE PARISH, LOUISIANA
JULY 2015

Item No.	*Reference*	*Comment*	*Response*
40	Table 9-9	Show the value for resulting CDI calculations	CDI values are presented for each media and exposure scenario in Tables 9-10, 9-11, and 9-14 through 9-19.
41	Table 9-9	Present similar table with assumptions as required by LA Protocol for Issuing Public Health Advisories.	Separate risk tables that include the LDEQ requested input parameters have been created as requested. These separate risk tables will be included as a separate submittal and also included as an appendix to the revised Tier 2 RI Report.
42	Table 9-11	RME presents results for current/future fisher-hunter frequenting drainage ditch. Provide similar table for current/future fisher-hunter frequenting North Devil's Swamp AOI. Use proUCL to calculate sediment EPC, including the results of Drainage Ditch sediment samples DD-12, DD-11. DD-10. DD-9, DD-8 and DD-7. These samples are also representative of NDSL AOIs. (Please note there is a large concentration of 57,000 ug/kg of PCB-1254 detected in the 6"-12" range at NDSL-13.)(Tier 1 RI Report, Section 5.3.3) If the HHRA identifies unacceptable risks, this will support to target this AOI for remediation.	It was assumed that the request was to provide a similar table for current/future fisher-hunter frequenting North Devil's Swamp Lake AOI. It is not reasonable that a fisher-hunter would be exposed to sediment in the North Devil's Swamp Lake AOI. In general, during a low Mississippi River stage, the depth of water in North Devil's Swamp Lake ranges from approximately 5 to 15 feet. Sediment exposure to a fisher-hunter (including Drainage Ditch sediment samples DD-12, DD-11, DD-10, DD-9, DD-8 and DD-7) was considered for the Drainage Ditch AOI because it is possible for a potential receptor to be exposed to those media in that area of site.
43	Tables 9-12 and 9-13	These tables are not specifically cited in the text, except in reference to dose calculations.	A reference to Tables 9-12 and 9-13 will be added to the text.
44	Table 9-16 and Table 9-17	Indicate in the notes where the EPA and Intake values are coming from and show the math for the calculation, not just a reference to the formula.	The notes in the tables will be revised to reference the appropriate EPC and intake equations for transparency.
45	Table 9-16 and Table 9-17	Present similar tables showing resulting risk when calculations are performed using assumptions required by LA Protocol for Issuing Public Health Advisories.	Separate risk tables that include the LDEQ requested input parameters have been created as requested. These separate risk tables will be included as a separate submittal and also included as an Appendix to the revised Tier 2 RI Report.