Glynn Environmental Coalition

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Mr. Jackson and Ms. Johnston,

The purpose of this letter is to request information, and submit questions and comments to be included in the official record for the LCP Chemicals Superfund Site Marsh Proposed Plan, Operable Unit One (1).

The Feasibility Study is built off the information contained in the Baseline Ecological Risk Assessment (BERA), Human Health Baseline Risk Assessment (HHBRA), and the Remedial Investigation (RI). The following comments will strive to address the LCP Marsh Feasibility Study (FS) by covering comments, questions, and concerns about these documents, and finally the Feasibility Study and the Proposed Plan (PP).

The period of time, 20 years, over which the LCP Site data were collected presents challenges of its own just related to the long period over which the data and studies were produced. These include: 1. Changes in Potentially Responsibility Party's Consultants and staff; 2. Continuity of EPA On-Scene Coordinators and Remedial Project Managers; 3. Demographic and socio-economic changes within the surrounding community; 4. Advances in scientific knowledge; and, 5. New and relevant research, studies, and reports concerning the marsh, estuary, and sound system in which the LCP Chemicals Site is located. Similarly, the institutional knowledge within the stakeholder agencies has undergone changes as key people retired, new hires came on and attempted to read the documents and get a grasp of the site conditions. Meanwhile, the sampling and analysis efforts declined and the existing data became dated and increasingly of limited value. Within this landscape of challenges, new agency personnel, and a feeling of urgency to get a Feasibility Study completed, the Proposed Plan for the LCP Marsh Operable Unit One (1) was produced.

The LCP Site documents reflect the challenges identified above. The following comments, questions, and studies and reports are presented to increasing the robustness and accuracy of the Feasibility Study and Proposed Plan, fully knowing the challenges the authors were encountering.

In the final analysis, the prudent course of action might be to use this point in time to develop a sampling and analysis plan, and a firm timeline for completion. There is an urgent need to obtain the information needed to produce complete BERA, HHBRA, and RI data needed to produce a viable FS and Proposed Plan with a measurable monitoring criteria to track and measure obtainment of remedial goals on a set timeline. The Proposed Plan should also establish follow-up actions to be taken if the remedial goals are not met at set points in time. Since the Potentially Responsible Parties (PRPs) have failed to produce the data needed to complete a viable remedial plan over an extended period of time measured in decades, the EPA is strongly urged to obtain the services of a competent contractor, such as Black & Veatch, to complete data collection needed and proceed with the Remedial Action without further delay. If need be, the EPA should use the available data to articulate the need for an "EPA Emergency Response and Removal Action" and designate the LCP Site a "Time Critical Action". The data identified in the following comments will support and articulate the need for a time critical action by the EPA.

With a full understanding of the challenges encountered during the 20 years leading up to the release of the proposed plan, the following comments are respectfully submitted. We trust the comments will help formulate a plan to develop a Proposed Plan that will obtain a timely cleanup and end the risk to human health and the ecosystem upon which the economic future of Brunswick and Glynn County, Georgia, depend.

Sincerely,

Daniel Parshley, Project Manager

Enclosures

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Baseline Ecological Risk Assessment (BERA) Comments and Questions

Cordgrass *(Spartina Alterniflora)*

The Baseline Ecological Risk Assessment (BERA) recognized Spartina as key to the functioning of the estuarine system, and the burden of Chemicals of Potential Concern (COPCs) were higher than biota at reference stations. Literature identifies Spartina as the base of the nutrient sharing system, and as such a key component to all life cycles in the estuarine system. Also noted was the Site is primarily vegetated with Spartina, which is also known as cord grass and marsh grass.

The BERA fails to identify why the marsh ecosystem is important, and in particular the nutrient transport system with *Spartina alterniflora* as the key species.

Why does the BERA fail to describe the marsh ecosystem in a manner that shows an understanding and knowledge about the movement of nutrients and Chemicals of Concern (COCs) within the ecosystem?

Why, in the entire 1002 page BERA, is *Spartina alterniflora* detritus potential to transport COCs not mention even once?

Has Spartina been identified and an initial vector for mobilization of sediment bound chlorinated hydrocarbons, such as PCBs, into the estuarine food chain (Mrozek, 1982)?

Have studies shown Spartina to be a key factor in bioaccumulation of PCB in detritus and an important means of entry for this pollutant into estuarine food webs (Marinucci, 1982)?

Did the LCP Marsh Remedial Investigation reported:

> "Sorption to organic carbon is the primary mechanism controlling the mobility and bioavailability of PCBs and PAHs in sediment, and also one of several mechanisms affecting bioavailability of divalent metals, including lead and mercury. Organic carbon is abundant in marsh habitat (e.g., detritus within the Spartina mud flats and dissolved organic carbon (DOC) from plant exudates, specifically fulvic and humic acids within the root zone of sediments). Sorption to soot, pitch, coke, and other black carbon forms can greatly decrease bioavailability of many hydrophobic organic compounds compared to amorphous organic carbon (Cornelissen et al., 2005)."

Does the statement from the LCP Marsh Remedial Investigation indicate the authors understood the importance of Spartina to the bioaccumulation and transport throughout the echo system and movement through the food web?

If so, why were steps to sample all parts of the Spartina plant not taken during the remedial investigation?

Has scientific literature noted a differentiation between the root rhizome stem and leaves and their ability to bioaccumulate PCBs?

Did *Sustainable Development in the Southeastern Coastal Zone* note .33 ppm in Spartina shoots, 2.80 ppm in roots (Army Corps of Engineers)?

Cordgrass *(Spartina)* and Mercury

The BERA noted:

> "Cordgrass (Spartina alterniflora) was characterized by concentrations of total mercury that ranged from a mean of 0.02 mg/kg (dw) in the Purvis Creek area to a mean of 0.147 mg/kg (dw) in the Main Canal area vs. 0.005 mg/kg in the Troup Creek reference location (Table 4-6a). Methylmercury frequently could not be detected in cordgrass and, when detected, averaged just 9.93 percent of concentration of total mercury (Appendix F)."

Why did the BERA limit resting for mercury to a section of the leaf 15 cm above the sediment?

Does Spartina testing most frequently and routinely sample the root, rhizome, stem, leaf, and detritus due to the selective bioaccumulation noted with Spartina (Mrozek, 1982; Windham, 2001)?

What was the decision-making process used to limit sampling to just a small section of the leaf, which is know from literature to be the part of the plant with the least bioaccumulation potential?

Were the BERA authors aware that in the fall, the root-rhizome material makes up 78% of the total live biomass and by spring this decreases to 53% (Schubauer and Hopkinson 1984)?

Did the authors of the BERA consider the Manatee has been seen grazes on the Spartina in the LCP Site area?

What was the decision-making structure used to limit the Spartina sampling to the leaf 15 cm above the sediment?

Were stakeholder agencies consulted such as the National Oceanographic and Atmospheric Association (NOAA) or U.S. Fish and Wildlife consulted before this Spartina sampling plan was limited to just the leaf 15 cm above the sediment?

What peer reviewed journal articles were used to support the decision to limit Spartina sampling to 15 cm above the sediment?

Did the BERA consider the potential for Spartina to bioaccumulate metals like mercury from sediment and excrete them from the leaf (Weis, 2003; Windham, 2001)?

What would the implications of Spartina growing on top of mercury contaminated sediments?

Would removing the Spartina from mercury contaminated sediments result in less transport from sediments into the ecosystem?

Did the BERA examine mercury transport via Spartina (Weise, 2003; Windham, 2001)?

Notable is the BERA fails to mention the same glands that excrete salt do excrete mercury. What was the reasoning of the BERA to exclude this critical fact about the excretion and bioaccumulation properties of Spartina?

Did the authors of the BERA do their due diligence and research to identify the potential of the biota to bioaccumulate and transport identified COCs? If not, why not?

Did any stakeholder agencies comment about the apparent selective use of data or data appeared to be censored?

Could the oversight of including mercury excretion along with salt from Spartina leaves be interpreted by a reasonable individual as the selective use of data or the censorship of data?

What is the EPA's explanation for such a critical piece of information, such as mercury excretion, being excluded from the BERA?

How would the exclusion of mercury excretion impact the risk calculations used to develop the Feasibility Study?

Would mercury levels in Spartina leaves be a critical piece of information for evaluating the potential impact to marine mammals like Manatees that use this plant as a primary food source?

Being that the St. Simons Sound and Turtle River are documented Manatee calving grounds, what significance is mercury in the Manatee's primary food source while lactating?

Cordgrass *(Spartina)* and Aroclor 1268

The BERA noted:

> Aroclor 1268 concentrations in cordgrass from the Site ranged from a mean of 0.096 to 0.261 mg/kg, in comparison to 0.0134 mg/kg at the reference location. The maximum concentration of 0.614 mg/kg occurred in Domain 1 at the AB Seep Location.

The BERA appears focused on Aroclor 1268. Were the following Aroclors found at the LCP Site – Aroclor 1016, Aroclor 1221, Aroclor 1248. Aroclor 1254, and Aroclor 1260

(ATSDR, 2014a)?

What PCB congeners are present in Aroclor 1016, Aroclor 1221, Aroclor 1248. Aroclor 1254, Aroclor 1260, and Aroclor 1268?

Do the PCB congeners found in Aroclor 1016, Aroclor 1221, Aroclor 1248, Aroclor 1254, Aroclor 1260, and Aroclor 1268 include those with dioxin and furan properties?

Were the non-dioxin-like and dioxin-like effects of the specific PCB congeners analyzed in the BERA, or was only a general Aroclor 1268 analysis conducted?

Were the EPA BERA protocols for analysis of PCB dioxin and non-dioxin-like effects conducted as part of the 2003 BERA for the LCP Site marsh (EPA, 2003)?

Were all congeners of PCBs detected at the LCP Site measured in the Spartina samples collected 15 cm above the sediment?

Was the PCB congener analysis limited to those found in Aroclor 1268?

What is the significance of the BERA focusing on Aroclor 1268?

Was the BERA limited to an analysis of Aroclor 1268? If not, where can the chemicals with similar modes of physiological action, like the other Aroclors, dioxin, and furans be found?

Was a Toxicological Equivalency Factor (TEF) developed for all the PCB Aroclors, dioxins, and furans found in Spartina? If not, why not?

> "The BERA limited Chemical of Concern (COCs) in Spartina (sp.) were limited to three - Mercury, Aroclor 1268, and lead."

What was the reasoning used to limit the COCs examined in Spartina?

Were toxicological effect found in organisms at levels lower than expected when the toxicological factors were limited to just the three factors: mercury, Aroclor 1268, and lead?

BERA Appendix E states:

> Smooth cordgrass occurs in all of the above-identified marsh zones, in great part because of its special adaptations that allow it to live where few other plants could survive. These adaptations include a tough and well-anchored root system, as well as narrow, tough blades and special glands that secrete excess salt, permitting it to withstand high heat and daily exposure to salt water.

The Spartina alterniflora nutrient recycling system, critical to the estuarine marsh system,

is notably missing from the BERA.

Why is the crucial nutrient recycling system the Spartina alterniflora serves for the estuary noticeably missing from the BERA?

The BERA is devoid of any discussion about the PCB bioaccumulation properties of Spartina in marsh environments. The potential for Spartina to be a significant reservoir of PCBs in the environment has not been identified or quantified, which would be a major factor in FS to identify areas for removal and determining total PCB mass calculation. As a major, if not the most primary and basic mechanism for transporting PCB in to biota at the base of the food chain, the lack of any information in the BERA is a glaring shortcoming in the report. Failure to be cognoscente of the potential for Spartina to bioaccumulate PCBs and incorporate them into the base of the food chair raises doubts about the technical expertise of the authors of the BERA work plan, or points to development of a work plan design to produce predictable results with the intent to under reporting actual levels of COCs. Regardless of the reason or intent, the fact remains that a major flaw in the BERA needs to be rectified.

Fiddler Crabs (*Uca minax* or red-jointed, *Uca pugnax* or mud fiddler, *Uca pugilator* or sand fiddler)

> "The greatest mean number of crabs, 196 individuals / m2 of substrate, was reported in a habitat characterized by medium-sized *Spartina* (0.5 -1.49 m in height), while 176 and 94 individuals / m2 were observed, respectively, in short *Spartina* (<0.5 m tall) and on essentially barren substrate (absence of vegetation)."

Why does the BERA limit reporting of PCBs in fiddler crabs to Aroclor 1268 (BERA, pg. S-5)?

Why does the BERA report found that they were fiddler crabs present in numbers (200 young and adult crabs per square meter) that might be expected to occur in a relative pristine marsh, but not quantify the amount of sediment brought to the surface on an annual basis?

Is the amount of sediment excavated from the sediments by Fiddler Crabs important information for remedies using capping of marsh sediments?

Why were Fiddler Crabs sampled at a location previously remediated (BERA, Pg. 55)?

Was the BERA data concerning fiddler crab abundance biased by sampling in a previously remediated area?

Can the encountering of the membrane at 40 cm be used to infer the minimum depth of the fiddler crab burrows are 15.75 inches (BERA, pg. 55)?

Does the BERA state "these burrows, which often extend to 2 ft in depth …. (BERA, pg. E-2)? What are the implications of sediment excavation activity by fiddler crabs to remedies involving placement of capping material over the marsh?

What is the quantity of sediment brought to the surface annually by over 200 fiddler crabs per square meter?

What is the quantity of sediment brought to the surface annually by the remaining biota (other than Fiddler Crabs)?

Mink *(Mustela vison)*

Even though mink are indigenous and wide-spread in coastal Georgia, mink are noticeably missing from the Site marsh indicating reproductive failure. Furthermore, no mink analysis is presented in the BERA. The reasonable assumption is the Chemicals of Concern (COCs) levels are sufficiently high around the Site to prevent reproductive viability in mink. **The range of mink should be established as a baseline before the Estuary Remedial Action (RA) is implemented.** The RA should sufficiently reduce COCs to allow, at a minimum, a viable reproducing mink population in the Site area.

Does the EPA intend to make identification of the mink range within the turtle River's system and the St. Simons sound estuary a priority?

If the EPA is can make mink range a priority what is the timeline for collection of this data?

The BERA notes the presence of mink in the estuary and notes these are animals found in the estuary. But, in the case of the LCP Site, and the BERA, the absence of any mink in the area is glaringly noticeable. Mink are sensitive to the chemicals present at the LCP Site, such as PCBs. It is unknown why the authors of the BERA or the EPA did not understand the significance of the absence of mink or make note of this fact, even though the absence was noted by the EPA previously (USEPA, 1997).

After identifying the Mink as an indigenous species missing from the ecosystem surrounding the LCP Chemicals Superfund site, why did the EPA eliminate the species from the baseline ecological risk assessment when it was obviously one of the most impacted species?

Is the EPA aware that mink are a species susceptible to adverse impacts from PCB exposure and a good indicator species for measuring ecological impacts?

What is the EPA's rationale for elimination of the mink from the BERA?

What is the EPAs explanation for the absence of mink from the LCP Site?

Does the EPA intend to identify the "dead zone' around the LCP Site where mink are absent?

Does the EPA intend to define the area where mink are absent, and delineate where viable and sustainable mink populations can be found?

If the EPA does determine the extent of the area where the contamination has eliminated the mink population, and will mink be used as a monitoring criteria to assess the Remedial Action?

If the EPA does intend to use the mink and a monitoring indicator, will this be placed in the Record of Decision and Consent Decree for the LCP Site?

Will the EPA recommend mink be used as monitoring criteria for assessment of the remedial action? If not, why not?

The BERA note (Section 6.2.2.5):

> An important source of uncertainty associated with this assessment endpoint is how well the river otter exposure model that represents a top-level piscivorous mammal could be extrapolated to dolphins and whether the TRV (based on Aroclor 1254 effects to mink) could reasonably be applied to dolphins.

Why should the EPA use otters when mink are an indigenous species and the indicated as the proper species to use?

Does the EPA agree that if an exposure model can be applied from the mink to the dolphin, the model can be applied from the dolphin to the mink?

The lack of a viable reproducing mink population does not indicate no problem, but rather quite the opposite. Alarms should be going off when an indigenous species shown to be sensitive to the chemicals released from the LCP Site is missing. The only conclusion can be a dead zone is surrounding the site. The baseline monitoring plan should use the mink as an indicator of marsh and estuary recovery. The area without a viable mink population should be delineated and help define the area of reproductive failure. The argument that a key species in the estuary is "just not present in this area" should not be accepted. The correct observation is "this is the only area where the mink is not present". The mink was suggested as an indicator of dolphin health by the Potentially Responsible Parties via dosing with Aroclor 1268. Notable is the lack of any mink sampling within the Turtle River estuary, which would have produced a real life's samples to use as an indicator of dolphin health. But these mink samples are not needed as an indicator of dolphin health because there is a wealth of data that has been collected from the resident dolphin population in coastal Georgia. It is now known dolphins are sick and lack of any reporting concerning this situation greatly questions to credibility or viability of the BERA as a decision-making document.

Is the EPA aware that PCBs have been associated with low mink kit survival and mink are a sensitive population to the toxic effects of PCBs (Bursian 2006; Bursian, 2013)?

Will the EPA consult literature and establish a remedial action level that will result in the recovery of the mink population at the LCP Site?

Dolphins

As previously noted, the lack of any information concerning the resident dolphin population in Turtle River and coastal Georgia is a glaring omission from the BERA. This omission is so glaring as to question the motives of the authors of the BERA. Since at least 2004, is been known that though dolphin population is grossly contaminated and this fact is been well documented. Furthermore stakeholder agencies have collected samples from the resident dolphin population, analyze the samples, and even conducted health assessments on the dolphin population. But the authors of the BERA have chosen to ignore this wealth of data.

What is the EPA's explanation for not including the dolphin data in the BERA?

Did the EPA failed to communicate with the stakeholder agencies, including the Georgia Department of Natural Resources, the National Oceanic and Atmospheric Administration, and the US Fish and Wildlife Service concerning the dolphin sampling and analysis?

Was the EPA oblivious to the fact that the same people that were producing data on the LCP Chemicals Superfund site were also doing sampling and analysis on the resident dolphin population for PCBs associated with the LCP site?

Notable are people who were sampling the dolphins and producing peer reviewed journal articles had also worked with EPA On-Scene Coordinators at the LCP Chemicals Superfund Site. It stretches the imagination to think that the EPA was not aware of the gross contamination in the resident dolphin population.

Inshore resident dolphin (T. truncates) populations exhibit long-term fidelity to specific estuaries and making them excellent sentinels for assessing the impact of stressors on coastal ecosystem health (Pulster, 2008). It is not surprising that the implications to human health were obvious to those studying the dolphins and they questioned the impact to the people who regularly and habitually consumed fish from the same waters (Schwacke, 2012).

The plight of the dolphins in Turtle River has been known since at least 2004. It was noted in the PCB levels were 10 times higher than those noted in the Savannah area dolphins (Pulstera, 2008). Literature reports 102 bottlenose dolphin blubber samples being analyzed from animals in Georgia (Balmer, 2011). The researchers noted that the levels of PCBs in the dolphins was associated with a point source near Brunswick Georgia or the LCP Chemicals Superfund site. The study was robust and photo identification was used to identify individual dolphins. Also noted were that the male dolphins in Turtle River had the highest concentrations of PCBs reported for any marine mammal, worldwide. The Aroclor 1268 levels were noted to be highest in the Brunswick Georgia area and decreasing with distance (Balmer, 2011).

The dolphins in the Turtle River estuary system were given a physical examination in addition to being sample for levels of PCBs. The result of the examination was the identification of anemia, hypothyroidism, and immune suppression associated with PCB exposure (Schwacke, 2012).

A high proportion of the sample dolphins suffer from anemia (26%), which is a finding previously reported being observed with Aroclor 1254. Furthermore the dolphins showed reduced thyroid hormone levels which were negatively correlated with PCB concentrations measured in the blubber. There was a correlation between immunity decrease and blubber PCB concentrations, which is suspected to increase susceptibility to infection and disease. Contrary to the assertions of the Potentially Responsible Parties that Aroclor 1268 is less toxic than other forms of PCBs, the re-searchers found the PCB mixture dolphins were exposed have substantial toxic potential and potential impacts on other top-level predators. Humans were identified as one of those other top-level predators consuming the same as fish species from the same estuary (Schwacke, 2012). **The significance of this empirical evidence and implications to human health appears to have been ignored by the EPA. At a minimum, the EPA has not conducted due diligence by conducting a basic literature search for the Superfund Site name for data and studies pertinent to the Site and the EPA decision-making process.**

The other notable impacts to the dolphins in Georgia coastal waters were skin disease, and specifically lesions. Again, the Brunswick Georgia site was found to have the highest incidence of skin lesions in bottlenose dolphins when compared to Sapelo Island Georgia and Sarasota Bay Florida (Hart, 2012).

The dolphins in the Turtle River estuary having the highest PCB concentrations required for any Marine mammal has raised considerable concern for both the dolphins and humans consuming seafood from this region of the Georgia coast. Dolphin densities were compared for the Brunswick Georgia area and the Sapelo Island area. The researchers noted that dolphin density in total abundance were sadistically higher in the Sapelo Island area than in Brunswick. Furthermore, anthropogenic stressors were identified as an important factor and potentially the cause of the differences in abundance density and habitat use observed (Balmer, 2013).

Research was done to establish the level of PCBs in fish that would result in tissue levels below the health effects threshold in dolphins. The model developed estimated that a dietary PCB concentration that did not exceed 5.1 ng/g (parts per billion or ppb) would be required to be protective of 95% of the dolphin population (Hickie, 2013). Very notable is how close the proposed maximum dietary PCB concentration is to the level that is protective of human health and the high quantity seafood consumer.

Will the EPA include the large volume of data on the coastal Georgia resident and transient dolphin population into the BERA? If not, why not?

Does the EPA understand the implications to human health from the dolphin data?

Does the EPA understand that dolphins and humans eat the same fish species?

Will the EPA incorporate the dolphin data into the HHBRA? If not, why not?

Does the EPA intend to incorporate the large volume of dolphin data into their decision-making process for the propose plan for the marsh at the LCP Chemicals Superfund site?

Will the EPA established a maximum allowable level of 5.1 parts per billion (PPB) in fish as the goal for the LCP marsh cleanup?

Notable is dolphin studies were not included in the BERA but were utilized in the Human Health Baseline Risk Assessment (HHBRA) to argue the Aroclor 1268 at the LCP Site is distinct and recognizable (Pulster, 2005; Pulster 2008).

As noted in the HHBRA:

> "Polychlorinated Biphenyl (PCB) homologue analysis of sediment and biota were presented in Kannan et al. (1997) and Kannan et al. (1998). The homologue proportions are substantially similar to the proportions in Aroclor 1268. More recent work indicates the same conclusions (Sajwan et al., 2008; Cumbee et al., 2008; Pulster and Maruya, 2008; Pulster et al., 2005)."

What is the rational for inclusion of the dolphin studies in the HHBRA to argue for only Aroclor 1268 sampling and not including them in the BERA?

Will the EPA utilize all the dolphins studies identified in these comments and the corresponding references to formulate Remedial Action levels protective of the resident dolphin population?

The HHBRA discusses using the dolphin data in the rationalizing for limiting sampling to Aroclor 1268 (Pulster, 2005; Pulster, 2008).

Were Aroclor 1254 found in 81 samples (9%), and Aroclor 1260 found in 37 (4.1%) in upland samples (ATSDR, 2014a)?

If Aroclor 1254 and Aroclor 1260 were found in upland samples, what was the EPA's rational for eliminating these PCB Aroclors from the COC to be sampled for in the LCP marsh?

Were other PCB Aroclors found in upland samples at the LCP Site, and if so, what was the EPA's rational for eliminating these from the COC to be sampled for in the LCP marsh?

Was PCB congener 206 established as the one defining Aroclor 1268 contamination from the LCP Site in coastal Georgia (ATSDR, 2014b)?

Is PCB congener 206 the most prevalent, or dominant, in Aroclor 1268?

Has a gradient of PCB congener 206 been found emanating from the LCP through sediment samples taken in coastal Georgia (ATSDR, 2014b)?

Using PCB congener 206 as an indicator of the boundaries of the LCP Site contamination, what are the geographical boundaries of the contamination from the LCP Site (ATSDR, 2014b)?

Did ATSDR compare and contrast total PCBs in fish between the Brunswick Georgia and Sapelo Island area (ATSDR, 2014b)? If so, what were the findings (differences quantified)?

Was the purpose of the ATSDR study to "Compare results in people with what is known about dolphins" (ATSDR, 2014b)?

Does the ATSDR study imply what is known about dolphins could be utilized to predict impacts to people eating the same fish species (ATSDR, 2014b)?

Did ATSDR report, "We did find that human and dolphin specimens contain qualitatively similar environmental contaminants" (ATSDR, 2014b)? Does this statement imply the dolphin data is very important to understanding chemical exposure to people from the LCP Site?

What are the implications to the HHBRA from the BERA not having included the dolphin data and studies identified in these comments to the EPA on the BERA?

The BERA and Dioxin/Furan

The BERA States:

> Dioxins/furans were collected from three sediment samples in October 2000 at C-6, C-8, and C-15 in the LCP estuary. Two additional samples were collected from the Troup Creek and Crescent River reference stations. Using the mammalian toxicity equivalency factors for each of the dioxin/furan congeners (U.S. EPA, 2008a), the toxicity equivalence concentrations (TECs) at the LCP estuary stations ranged from 54 ng/kg to 1,878 ng/kg. At the two reference stations the dioxin TEC concentrations were less than 10 ng/kg. The EPA Region 4 sediment screening-level for dioxins is 2.5 ng/kg which are based on the most toxic form of dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin [TCDD]). The maximum concentration of TCDD in the reference samples was 1.7 ng/kg while the highest concentration of TCDD from the three estuary samples was 53.7 ng/kg at C-6. Therefore, dioxins/furans are of concern. However, no further sediment or biota samples were analyzed for dioxins/furans during the monitoring program. **Therefore, potential risk cannot be adequately evaluated in this assessment based on the three sediment samples collected in 2000, but will be discussed further in the uncertainty section. (emphasis added)**

Are the TECs (a.k.a TEQ) reported 2 to 4 orders of magnitude higher than the EPA screening level of dioxin of 2.5 ng/kg?

Was any effort whatsoever made by the EPA to obtain existing dioxin/furan data from the St. Simons Sound in which the LCP Site is located?

Did the EPA ask Stakeholder Agencies if they had collected Dioxin/Furan data for the St. Simons sound estuarine system?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder and Black Drum (both whole and filet) in Turtle River in 1989 (GADRN, 1989)?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder, Black Drum. Sheephead, and Hardhead Catfish (filet) in Turtle River in 1990 (GADRN, 1990)?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder, Black Drum. Sheephead, (whole and filet) in Turtle River in 1991 (GADRN, 1991)?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder, Atlantic Croaker, and Gafftopsail Catfish (whole and filet) in Turtle River in 1992 (GADRN, 1992)?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder, Black Drum, and Hardhead Catfish (whole and filet) in Turtle River in 1993 (GADRN, 1993)?

Did the EPA take into consideration the Dioxin/Furan sampling of Southern Flounder, and Stripped Mullet, (whole and filet) in Turtle River in 1993 (GADRN, 1993)?

Did the EPA consider the four samples for Dioxin/Furan taken in the Altamaha Canal south of the LCP Site in 2011 with results above the 2.5 NG/KG TEC (a.k.a TEQ) of 62, 130, 68, and 20 ng/kg (EPA, 2011)?

Did the EPA consider the December 1995 EPA Community Based Environmental Project's 14 sediment samples from the Turtle River/St. Simons Sound area?

In light of all the above Dioxin/Furan sampling conducted by the EPA or one of the LCP Chemicals Superfund Site Stakeholder agency, why should anyone, or the court who considers the Consent Decree, believe the EPA when it states, "Therefore, potential risk cannot be adequately evaluated in this assessment based on the three sediment samples collected in 2000, but will be discussed further in the uncertainty section"?

The EPA has interjected data from the lake Onondaga LCP site located near Syracuse, New York, into the Proposed Plan for the LCP site in Brunswick Georgia. Unlike the LCP site located in Brunswick Georgia, there was a significant amount of dioxin data collected at the LCP site located in New York (USEPA, 2002).

Was whole fish sampling for dioxin and furan in juvenal and adult fish conducted at the LCP site in Brunswick Georgia, or only at the Lake Onondaga Site?

Do the dioxin and furan sampling at the Lake Onondaga site in New York find a risks to wildlife from dioxin and furans (USEPA, 2002)?

If the risk from wildlife from dioxin and furans was found at the Lake Onondaga site, with those risks be applied to the wildlife at the LCP site in Brunswick Georgia? If not, why not?

If the EPA is using data from the Lake Onondaga Site for decision-making concerning sampling of dioxin and furan at the LCP site in Brunswick Georgia and to delay such sampling until after the Record of Decision and Consent Decree, why not use the same reasoning to utilize the data for estimating risk in Brunswick from the observations at the New York site?

Will the EPA order whole fish sampling for dioxin/furan in juvenal and adult fish from Turtle River to obtain the same quality data as used at Lake Onondaga, New York?

> "In mammals, learning behavior and development of the reproductive system appear to be among the most sensitive effects following prenatal exposure. In general, the embryo or fetus is more sensitive than the adult to dioxin-induced mortality across all species (ATSDR, 1998c, U.S. EPA, 1994a).
> Environmental exposure to dioxins includes various mixtures of CDDs, CDFs, and some PCBs. These mixtures of dioxin-like chemicals cause multiple effects that vary according to species susceptibility, congeners present, and interactions." (USEPA, 1994a)

Did the BERA include the dioxin and furans within the Turtle River area in their calculations for PCBs, dioxins, and furans TEQ or the hazard quotient or the hazard index?

Manatee

The Manatee, and endangered and protected species, is mentioned in the BERA but none of the work recommended by the US Fish and Wildlife Service (USFWS) has been completed. Again, the recommended work was centered on the keystone plant species in the LCP marsh, Spartina.

Did the USFWS find a need to examining the roots and note cleaning of the Spartina could result in an underestimation of the exposure scenario of herbivores like the Manatees, and the others in residents year round (USFWS, 1996)?

What was the EPA's rationale for not including the Manatee in the Baseline Ecological Risk Assessment?

Is EPA aware that the Manatees is an endangered and protected species?

What action is the EPA taking at the LCP Chemicals Superfund site to assure the Manatee is not consuming excessive amounts of PCBs, mercury, and dioxin via the cordgrass (Spartina)?

Did the EPA make an estimation about how much sediment the Manatee would consume while foraging on the cordgrass (Spartina)? If not why not?

Diamondback Terrapin

Early in the examination of the LCP Chemicals Superfund Site for ecological damage the diamondback terrapins were examined. The terrapins were found to be suffering from wasting syndrome and reproductive problems. The BERA appears to have drifted away from the empirical evidence presented to modeling impacts.

In light of the wasting syndrome reproductive problems identified with the Terrapin, how did the BERA come to the conclusion that there is a hazard index or hazard quotient less than one?

Is it possible to have reproductive failure and a hazard quotient or hazard index less than one?

Is it true that the levels of PCBs observed in the Terrapin eggs was in excess of 600 ppm (USEPA, 1997)?

Were the eggs examined for reproductive viability?

What were the results of the examination of the Terrapin eggs for reproductive viability?

Will the Terrapin be included in the species used for monitoring and evaluating the remedial action efficacy?

Human Health Baseline Risk Assessment Comments and Questions

The only appropriate way to start the review of the Human Health Baseline Risk Assessment is with the following two quotes from studies that do, unlike the EPA or the Potentially Responsible Parties, fully realize the serious and dangerous situation facing people residing around the LCP Chemicals Superfund Site, the need to evaluate the dolphin data, studies and reports; and, in particular anyone consuming seafood from the St. Simons Sound estuarine system.

> "Moreover, PCB signatures in dolphin blubber closely resembled those in local preferred prey fish species, strengthening the hypothesis that inshore T. truncatus populations exhibit long-term fidelity to specific estuaries and making **them excellent sentinels for assessing the impact of stressors on coastal ecosystem health** (Pulster, 2008)".

> "The severity of the effects suggests that the PCB mixture to which the Georgia dolphins were exposed has **substantial toxic** potential and further studies are warranted to

elucidate mechanisms **and potential impacts on other top-level predators, including humans, who regularly consume fish from the same marine waters** (Schwacke, 2011)."

When reviewing the Human Health Baseline Risk Assessment (HHBRA) is important to keep in mind the saying "garbage in garbage out". In case of the HHBRA, there was plenty of garbage to go around. But in spite of the tendency to make light of how bad the document is, the ramifications to Glynn County and the surrounding Brunswick community are real, serious, and have significant ramifications to the future health and welfare of the citizens of Glynn County, and anyone from the surrounding coastal Georgia Counties catching and consuming seafood from the contaminated areas. Furthermore, the area of contamination delineated appears incomplete and limiting the remedial activities the site property boundaries could be grossly inadequate. The failure to produce a viable document is a real threat to human health. Like the Baseline Ecological Risk Assessment, what is missing from the report is more notable than what is in the report. In addition to the dismal quality of the report, the EPA has a long history of less than competent efforts to protect human health and the environment around the LCP Chemicals Superfund site for the past 20 years. This indicates the EPA has never had a firm grasp on the seriousness of the problem at the LCP Chemicals Superfund Site. Further aggravating the problem is the numerous changes in s EPA Remedial Project Managers, which is not meant to reflect on the character of the Remedial Project Managers but rather another indicator of the EPA management's inability to put a lucid and comprehensive plan together for the LCP Chemicals Superfund Site and move the cleanup ahead in a timely manner.

Numerous action items were identified for the EPA to implement in the Brunswick, Glynn County, community to protect people from the risks from the LCP Chemicals Superfund Site. These include, but not limited to, following recommendations from the Agency for Toxic Substances and Disease Registry (ATSDR, 1994, 1996, 1999, 2014):

- Raise awareness about the fishing advisories among residents and healthcare providers.
- Improve the fishing advisory signs so that they are more easily seen.
- Maintain the fishing advisory until the source of contamination is removed.
- Continue public education regarding the hazards of consuming Mercury contaminated seafood with a focus on pregnant and nursing women, children, the elderly, and those with compromised immune systems. Evaluate the feasibility of developing a fact sheet based on the Georgia DNR guidelines for eating fish from Georgia waters, specific for fishing areas in Glynn County to be made available were fishing licenses are sold.

What programs has the EPA implemented to raise awareness about fishing advisories among residents and healthcare providers?

What were the dates of the EPA initiatives to raise awareness with health care providers about the seafood advisories?

What improvements did the EPA make to the fishery advisory signs so they are more easily seen?

How many fish advisory signs has the EPA had placed in the community?

Where are the fish advisory signs the EPA has placed in the community located?

What is the EPA's budget for fish advisory signs?

What is the EPA's budget to maintain the fish advisory until the source of contamination is removed?

What is the EPA's budget for continuing public education regarding the hazards of consuming mercury and PCB contaminated seafood?

How does the EPA focusing on pregnant and nursing women, children, the elderly, and those with compromised immune systems?

The EPA answering the above questions is critical in evaluating the Feasibility Study since institutional controls are be considered for protection of human health. The EPA's performance over the past 20 years in implementing recommendations protective of human health will be a very good indicator of what can be expected moving forward. Indications are the EPA is inept and does not have the management continuity to implement or manage a competent program of institutional controls. Therefore, at a minimum, the EPA should appropriate sufficient funding to have the appropriate actions implemented on the local level for as long at the threat from contaminated seafood remains.

Will the EPA require an appropriation or appropriate funding to implement the already identified activities to better protect human health and the environment?

Will the EPA expedite the appropriation of funds to implement the recommendations intend to help protect human health?

The stated goal of the HHBRA is: The overall goal of this risk assessment is to develop essential scientific information that can be used in decision-making regarding the LCP Chemicals Site estuary in support of an evaluation of the need for remedial action.

The guidelines for seafood sampling utilized for the HHBRA state:

> "For scaled fish, fillets should be scaled but left with the skin on. For fish without scales, the skin should be removed from the fillet " (GA-DNR) (FTAC, 1992).

Are the fish samples collected from Turtle River being prepared according to the appropriate protocols and the skin and belly flap left on the filet?

Was whole fish sampling conducted in order to determine the range of exposures human consumers might encounter?

> "For the fish consumption risk assessment, both RME and CTE exposure assumptions (Table 10) were developed from USEPA (1997a) and other sources (DHHS, 1999; Appendix B)."

Agency for Toxic Substances and Disease Registry (ATSDR) Public Health Assessment (PHA) found the 1999 Department of Health and Human Services (DHHS) report on seafood consumption from the turtle River area to be inappropriate for estimating risk to the African-American population in Brunswick and Glynn County Georgia. Specifically, ATSDR noted:

> "And finally, it should be noted that African-Americans made up only 4% (9 out of 211) of the people who participated in the study. African-Americans make up 26% of the population of Glynn County and nearly 40% of the population within four miles of the LCP Chemicals Site. Therefore, African-Americans are underrepresented in the Brunswick fish study.
> A study of fishers along the Savannah River showed that African-Americans
> • Eat more fish meals per month than whites (average, 5.4 vs. 2.9),
> • Eat slightly larger portions than whites (average, 13.7 oz. vs. 13.1), and
> • Eat higher amounts of fish per month than whites (average, 75 ounces vs. 41 ounces).
> It is reasonable to assume that the fish-eating habits of African-Americans in Brunswick, Georgia, are similar to African-Americans along the Savannah River. Therefore, African Americans who fish along the Turtle River are likely to have higher exposure to mercury from eating fish than whites. The results of the Brunswick fish study should not be applied to African Americans in the Brunswick area for those reasons." (ATSDR, 2014a)

Notable is that the EPA's own database found 72% the population within 1 ½ miles of the LCP site reported their race as black, or African American. In addition based on reported 1999 household income 32% reported under $15,000, and 18% under $25,000 (EPA, 2015).

The authors of the HHBRA put great weight in the average yearly income of the coastal Georgia residents in evaluating seafood consumption patterns. The HHBRA reports the average yearly income of coastal Georgia ZIP Codes as being $38,193. Obviously the EPA's own data indicates the actual income level of over 50% of the people is less than half that was what is reported in the report. The HHBRA stated:

> "There were very few consumers of Striped Mullet and Spot. Census data can provide the average income per zip code. The average income of the zip codes of anglers harvesting Spot and Striped Mullet were obtained from databases maintained by the Missouri Census Data Center (MCDC, 2006). The average yearly income of the zip codes of the coastal Georgia residents harvesting Spot from 2001 to 2005 was $35,240. The average yearly income of the zip codes of the coastal Georgia residents harvesting Striped Mullet from 2001 to 2005 was $37,847. The average yearly income of all the coastal Georgia zip codes was $38,193. These income values seem quite similar."

Did the EPA review their own demographic data for the area around the LCP Chemicals Superfund site when reviewing the HHBRA (EPA, 2015)?

Did the EPA advise the authors of the HHBRA that they could find more accurate demographic data and household income data on the EPA's website (EPA, 2015)?

Is obvious the authors of the HHBRA were struggling to find data. Even data points of the single fishermen appeared to be important to them. It is obvious the authors were struggling to find demographic data. As noted in the HHBRA:

> "It is interesting to note that of the group of nine anglers who harvested Spot from 2001 through 2005, **only one came from Brunswick** (emphasis added) whereas four came from Savannah. The average zip code income of this single Brunswick angler was $23,898. The average zip code income of the Savannah anglers ranged from $18,830 to $60,182. In addition, there may be income variability within a single zip code but income data for smaller areas are not available."

And,

> "It is possible that some subsistence anglers lived in the Savannah zip code in which the average income was $18,830. However, none of these anglers were from the Brunswick area and there remains no evidence that there were subsistence anglers in the Brunswick area."

If the authors of the HHBRA were using income as an indicator of whether fishermen were or were not subsistence anglers, 32% of people living within 1 ½ miles of the LCP Site having an annual household income of under $15,000 would have been very significant and the only conclusion that could be made is that there are a very significant number of subsistence fishers in Brunswick, Georgia, based upon the metrics utilized in the HHBRA.

Will the EPA utilize the income data from their website to modify the HHBRA to indicate there's a high likelihood of a significant numbers of subsistence fishers within close proximity to the LCP site?

Over and over the authors of the HHBRA utilize data from a relative small number of people. They found two Glynn County residents identifying themselves as subsistence fishers as being significant. As noted in the HHBRA:

> "Appendix B of the HHBRA - Because the ATSDR/GCHD seafood survey (DHHS, 1999) included two Glynn County residents who identified themselves as "subsistence" fishers, this risk assessment included an evaluation of hypothetical high quantity consumers of fish."

It was obvious while reading the HHBRA that the authors were going to great extent to disprove through data on income and demographics that they were not subsistence fishers. Long and detailed discussions about what was or was not a subsistence fish filled the HHBRA. It was obvious the authors lost site of the purpose of the HHBRA and that is to establish the likely amount in seafood being consumed by the local population. Furthermore the HHBRA should

utilize ecological data as an indicator of potential impacts to human health and the environment. The BERA appeared to selectively exclude data that would have provided the needed information through sentinel species such as dolphins. But the plight of the dolphins and its implication to human health and the environment is not lost on researchers in coastal Georgia (Schwacke, 2012). A great deal of research and study has been conducted on the resident dolphin population. The extremely high levels noted in the dolphins led to significant concerns about the human population consuming seafood in coastal Georgia. Sampling of nine humans did take place in the area of Sapelo Island and the results were reported to the personnel from stakeholder agencies and the EPA Remedial Project Managers working on the LCP Chemicals Superfund Site (ATSDR, 2014b). Without doubt the presentation was about the LCP Site since it specifically mentioned the LCP Site 25 times. Also notable is the authors of the HHBRA use the same dolphins studies that were used to link the PCBs found in humans to the LCP Site to define Aroclor 1268 (Pulster, 2005; Pulster 2008). Actually, the studies quoted by the HHBRA authors unequivocally identified the signature as being linked with the LCP site and noted his potential to harm human health and the environment.

> "Legacy organochlorine (OC) contaminants continue to pose a **potential risk to ecological and human health in coastal aquatic ecosystems of the southeastern United States." (**Pulster, 2005)

Does the EPA agree that the definition of Aroclor 1268 presented in Pulster, 2005 and Pulster, 2008 was used in the HHBRA to define PCBs associated with the LCP site?

Does EPA agree that the same PCB profile described in Pulster, 2005 and Pulster, 2008 was used to define an associate the PCBs found in humans sampled in the Sapelo Island area (ATSDR, 2014b)?

The September 3, 2014 presentation, *Polychlorinated Biphenyls (PCBs) in Georgia Coastal Environments and Populations,* to provide helpful information about the quantities of fish consumed in coastal Georgia. Based upon the surveyed fishermen, the appropriate annual number of seafood meals to be utilized for calculations in the HHBRA would be 156 (3 meals per week X 52 weeks = 156 meals per year) rather than the 40 utilized for risk-based calculations in the HHBRA. Notable is the 8 of the people sampled were from a community of 195 people and represent over 4% of the population. The high consumption consumer might exceed 156 meals per year the EPA should consider a greater number of meals per year than 156.

Will the more current data (ATSDR, 2014b) collected in coastal Georgia rather than the discredited data that's now 20 years old (DHHS, 1999)?

Will the EPA set the annual number of seafood meals consumed by the high quantity consumer at 156 or higher?

Will the EPA increase the size of the meal to reflect those consumed by African-Americans as reported in the Public Health Assessment (ATSDR, 2014a)?

As noted in real world survey of coastal Georgia fish consumers, the following consumption habits were documented (ATSDR, 2014b). The actual seafood consumption habits are far different the assumptions used in calculating risk, which were based upon filets only, and did not consider fish egg (roe) consumption.

- Filet with skin removed -11%
- Filet with skin on – 33%
- Whole fish (gutted) – 56%
- Whole fish (not gutted) – 11%
- Fish eggs – 44%

The cultural habits and preferences for seafood preparation and consumption are discussed further in the section - Feasibility Study Comments and Questions.

A considerable effort was made to obtain the sampling results and the reported high and low level of total PCBs observed in the nine sampled human subjects (ATSDR, 2014b). The numerical total PCB data in conjunction with the total PCB data from fish and shellfish could be utilized to better set maximum health-based remedial action goals. Good data is critical to accurate assessments through the calculations used to determine risk and set remedial action goals protective of human health and the environment. Even though quantitative results were presented at the September 3, 2014 meeting, the CDC and the agencies involved in producing the data have refused to provide the information critical to formulating a robust and protective cleanup plan and remedial action. Therefore, it became necessary to submit a Freedom of Information Act (FOIA) request to the Center for Disease Control (CDC). The FOIA was submitted in a timely manner that the CDC has been excessively recalcitrant and resistant to releasing any data. An Expedited Processing Request was submitted due to the limited time provided to submit comments to the EPA on the Proposed Plan for the marsh at the LCP site. At this time, it appears the EPA public comment period on the proposed plan will close without the requested data being received for inclusion two in the public participation and comment phase of the proposed plan decision-making process. At this time it is the intent of the Glynn Environmental Coalition to continue efforts to obtain the data critical to a robust and protective Proposed Plan, Remedial Design, and Remedial Action in the LCP marsh. Furthermore, the Glynn Environmental Coalition may exercise its right to challenge the Consent Decree when entered before the court and request the data be incorporated into the Proposed Plan, Record of Decision, and the Consent Decree.

The history of the effort of the Glynn Environmental Coalition to obtain the high and low levels of total PCBs observed in the human sampling study follows:

- September 3, 2014: ATSDR presentation “Polychlorinated Biphenyls (PCBs) in Georgia Coastal Environments and Populations” takes place.
- October 17, 2014: FOIA request to CDC/ATSDR for the underlying data, reports, or other information concerning Polychlorinated Biphenyls (PCBs) in Georgia Coastal Environments and Populations, presented on September 3, 2014, by the Health Studies Branch, by Lorraine Backer and David Mellard, National Center for Environmental Health Eastern Branch, Agency for Toxic Substances and Disease Registry.

• October 22, 2014: FOIA responds acknowledging receipt – informs that they will not be able to comply within the 30 days max provided by statute (20 business days plus ten day extension).
• November 7, 2014: Glynn Environmental Coalition contacts FOIA in effort to speed up process. "Due to the need for a prompt response to Request Number: 15-00080-FOIA, we request communications concerning any charges be made via email or arrangements for pre-payment be arrange to avoid any delays."
• November 14, 2014: Update from CDC on progress of request.
• November 25, 2014: Glynn Environmental Coalition emails CDC to narrow request in effort to expedite response; Concerning the Study presented. The scope of the request can be narrowed to:
- The study Methods
- Individual analytical results with identifying information redacted
- Study maps
- Abstract or Summary Report
- Full report w/o identifying information about the participants
- References and bibliography

CDC acknowledges receipt and revised request was sent to appropriate program office for a new search – refused to provide date by which request would be completed.
• December 19, 2014: Glynn Environmental Coalition calls CDC re: FOIA request.
• January 6, 2015: Letter from CDC stating amended request was still being processed, that CDC is under backlog, and CDC cannot give a timeframe for when request would be completed.
• January 26, 2015: Glynn Environmental Coalition officially requests expedited processing for the request.
• February 2, 2015: CDC denies expedited processing request and 30-day appeal process begins.
• February 20, 2015: Appeal of denial for Expedited Processing sent to CDC FOIA Office.
• February 24, 2015: CDC Acknowledgement of Receipt of Administrative Appeal
• March 16, 2015: EPA public comment period expires on the LCP Chemicals Superfund Site Proposed Plan.

Extensive contamination of the turtle River area with dioxin and furans has been documented over a number of decades but is noticeably missing from the HHBRA. Failure to collect dioxin and furan data over a 20 year at the LCP site strains the credibility of EPA management and those conducting the investigation of the site. The EPA has clear and specific guidance for assessing risk from sites with chemicals with dioxin like and non-dioxin like risks such as PCBs and assessing the carcinogenic and non-carcinogenic risk (EPA, 2000).

> "Therefore, separate risk assessments should be conducted for the dioxin-like and nondioxin-like PCB congeners if the congener analysis indicates elevated concentrations of dioxin-like congeners relative to the typical commercial mixtures (IRIS, 1999; U.S. EPA, 1996c).
>
> Therefore, failure to evaluate the dioxin-like PCB congeners could result in underestimating cancer risk.

Dioxins have been shown to cause adverse developmental effects in fish, birds, and mammals at low exposure levels. Several studies in humans have suggested that dioxin exposure may cause adverse effects in children and in the developing fetus.

In mammals, learning behavior and development of the reproductive system appear to be among the most sensitive effects following prenatal exposure. In general, the embryo or fetus is more sensitive than the adult to dioxin-induced mortality across all species (ATSDR, 1998c, U.S. EPA, 1994a).

Environmental exposure to dioxins includes various mixtures of CDDs, CDFs, and some PCBs. These mixtures of dioxin-like chemicals cause multiple effects that vary according to species susceptibility, congeners present, and interactions.

Risk assessment of these complex mixtures is based on the assumption that effects are additive and there is some experimental evidence to support this (U.S. EPA. 2000).

Organochlorine pesticides, PCBs, dioxins/furans tend to concentrate in fatty tissues (Armbruster et al. 1989; Branson et al., 1985; Bruggeman et al. 1984; Gutenmann et al. 1992; Kleeman et al., 1986a, 1986b; Ryan et al., 1983; Skea et al., 1979; Sanders and Hayes 1988; U.S. EPA, 1995a). Many of these compounds are neither readily metabolized nor excreted and thus tend to biomagnify through the food web (Gardner and White, 1990; Lake et al., 1995; Metcalf and Metcalf, 1997; Muir et al., 1986; Niimi and Oliver, 1989; Oliver and Niimi, 1988; U.S. EPA, 1995a)."

Will the EPA utilize existing dioxin and furan in fish data and incorporated into the HHBRA risk analysis (GA DNR, 1989; GADNR, 1990; GADNR 1991; GADNR, 1992; GADNR, 1993; GADNR, 1994)? If not, why not?

Remedial Investigation Comments and Questions

The Remedial Investigation (RI) appears to present opining and unsubstantiated statements of fact. The quantity and quality of the data used in the RI appears to have flawed the remaining site documents. Significant data gaps need filling before a viable RI/FS can be produced for the LCP Site. As previously noted in comments from the stakeholder agencies, quantity of data should not be confused with quality of data.

8.2.3.2.2 Fish Consumer Scenarios

"The fish consumer scenarios are used to evaluate potential exposure to COPC in fish caught in areas of the estuary proximate to the LCP Site. Fish Consumption Guidelines (FCGs) have been established by GADNR for these areas (GANDR 2011) and these FCGs are made available to the public via the GADNR website. GADNR **also posts signage in areas subject to the FCGs to advise anglers about the potential hazards**

> **associated with consuming fish and shellfish from these areas**.(emphasis added) …. The recreational fish consumer scenario is used to evaluate exposure to recreational anglers who consistently consume fish from the LCP estuary over a long period of time (e.g., 26 meals per year for 30 years for adults). ….. The high quantity fish consumer scenario is used to evaluate exposures to individuals who consume more locally-caught fish than the typical recreational angler (e.g., 40 meals per year for 30 years for adults)."

How many signs have been posted by the GADNR in the area and where are the signs located?

Has the high quantity fish consumer meal assumption of 40 meals per year been discredited (ATSDR, 2014a)?

Are a more appropriate number of meals for the high quantity fish consumer closer to 156 per year (ATSDR, 2014b)?

8.2.3.2.3 Shellfish Consumer Scenario

> "The shellfish consumer scenario is used to evaluate potential exposure to COPC in shellfish (e.g., white shrimp and blue crab) caught in areas of the estuary proximate to the LCP Site. As described above for fish, GADNR also develops FCGs for shellfish. The shellfish consumer scenario assumes consistent and long-term consumption of shellfish directly from the LCP estuary (e.g., 19 meals per year for 30 years for adults). This scenario uses data on the amount of shellfish fish consumed by children, adolescents, and adults in the United States (EPA, 1997a)."

Does the EPA actually believe the data presented in the RI for shellfish consumption in light of catching crabs and casting for shrimp being recreational activities in coastal Georgia?

Has either the EPA or the Responsible Parties noticed all the docks along Turtle River and the crab trap lines extending onto the water?

Did the authors of the RI make any attempt to observe seafood harvest and consumption patterns along the Georgia Coast or are all the assumptions in the RI averages of the entire population of the United States?

Is the EPA aware of just how dangerous applying data from national consumption pattern is when determining risk to a local population from a locally contaminated food source?

What does the FDA recommend to do when a locally contaminated food source is encountered?

8.2.6 Characterization of Uncertainties

"… posted signage generally serve to discourage the consumption of significant amounts of seafood from the area, particularly given the number of meals assumed to be eaten consisting of fish caught in the LCP estuary;"

What is the study cited in support of the conclusion "….posted signage generally serve to discourage the consumption of significant amounts of seafood from the area…"?

Are the authors of the RI citing a study or opinion when they state "….posted signage generally serve to discourage the consumption of significant amounts of seafood from the area…"?

What is the definition of the LCP estuary and what are the geographical boundaries?

Is the "LCP estuary" defined by the extent of contamination from the LCP Site in coastal Georgia?

Does the Georgia Department of Natural Resources seafood consumption advisories encompass the entire "LCP estuary"?

Have any agencies questioned the need to extend the extent of seafood consumption advisories due to the spread of contamination from the LCP Site (ARSDR, 2014b)?

Have any recommendations or suggestions been made concerning expanding the sampling and analysis in the ecosystem and humans to more fully identify the extent of LCP Site contaminants spread (ATSDR, 2014b)?

8.3.3.4 Chemicals of Potential Concern (only mention of dioxin in the RI)

"Several additional organic chemicals were detected in a small number of samples at concentrations above the conservative EEVs, including dichlorodiphenyltrichloroethane (4,4'DDT), dioxin/furan congeners, bis(2-ethylhexyl)phthalate, 3,4-methylphenol, butylbenzylphthalate, and hexachlorobenzene. These chemicals are not quantitatively evaluated for benthic or food chain risks, but are discussed qualitatively in the OU1 BERA."

Were the chemicals detected in a small number of samples or were they identified for analysis in a small number of samples?

How many samples were taken in the LCP Site marsh, and how many were specified for dioxin and furan analysis?

What is the difference between qualitative and quantitative when establishing risk in a document like the BERA?

How was risk established through a qualitative discussion of dioxin and furan in the BERA?

Did the quality and completeness of the sampling and analysis for dioxin and furan in the RI a hindrance to evaluating risk in the BERA and HHBRA?

8.3.5.8 Piscivorous Mammals (Assessment Endpoint 7)

> "One LOE was used to evaluate the viability of piscivorous mammals foraging within the LCP estuary: HQs derived from food-web exposure models for river otters. The following is a summary of the findings:
>
> • The modeling study for river otters generated Site NOAEL HQs for Aroclor-1268 (based on a TRV for Aroclor 1254) that ranged from 0.1 to 3.9. No LOAEL-based HQ for Aroclor-1268 exceeded 1. In addition, no risk of adverse effects was predicted for mercury or lead exposures. Based on these findings, the BERA Report concluded that the potential risk to the viability of piscivorous mammalian species utilizing the LCP estuary is minimal."

Would the conclusion "….BERA Report concluded that the potential risk to the viability of piscivorous mammalian species utilizing the LCP estuary is minimal" if the dophin data was added to the BERA (Balmer, 2011; Balmer, 2013a; Balmer 2013b; Hart, 2012; Hickie, 2013; NOAA, 2013; Pulster, 2005; Pulster, 2008; Schwacke, 2012)?

What impacts to dolphin health were found in the studies (Balmer, 2011; Balmer, 2013a; Balmer 2013b; Hart, 2012; Hickie, 2013; NOAA, 2013; Pulster, 2005; Pulster, 2008; Schwacke, 2012)?

Were the health effects found in dolphins "minimal" (Balmer, 2011; Balmer, 2013a; Balmer 2013b; Hart, 2012; Hickie, 2013; NOAA, 2013; Pulster, 2005; Pulster, 2008; Schwacke, 2012)?

Were the chemicals found in the dolphins linked to the LCP Site (ATSDR, 2014b)?

Would the EPA find the absence of an indigenous species like the mink from the LCP Site significant?

Would the absence of a viable mink population indicate there is a dead zone where mink cannot survive around the LCP Site?

Would a dead zone where mink cannot survive be described by the EPA as "minimal risk"?

Would the EPA agree that the observations in the dolphin population indicate the models referenced in the RI are significantly flawed and do not agree with the observed ecological impacts? If not, why not?

What is the definition of "minimal risk" used in the RI?

Does the empirical evidence documented prove the models in the BERA and RI do not hold up when compared what is known about ecosystem on the Georgia coast and the impacts from the chemicals associated with the LCP Site (Balmer, 2011; Balmer, 2013a; Balmer 2013b; Hart, 2012; Hickie, 2013; NOAA, 2013; Pulster, 2005; Pulster, 2008; Schwacke, 2012, ATSDR, 2014b)?

Feasibility Study Comments and Questions

The Feasibility Study (FS) could not be fully evaluated for a number of reasons. Most frequently, there was an insufficient amount of information or the technologies previously identified for consideration by the stakeholder agencies were not carried through the FS evaluation process. Much of the data utilized over the 20 years the FS was produced became outdated or otherwise discredited. More current data was produced about the state and condition of the ecosystem, cultural seafood consumption preferences, and demographics of the populations most impacted from the Site. To a large extent, the current data was not incorporated into the LCP site documents, and therefore not utilized in the FS. The FS became dated, lost continuity of process over the extended number of years, and otherwise became disconnected with the realities of Site conditions and the surrounding community.

Significant deficiencies identified in the FS were:

- The seafood consumption data underlying risk calculations was discredited by ATSDR and new data became available to evaluate human exposure to Site COCs (ATSDR, 2014a; ATSDR, 2014b). The appropriate meals per year number appear to be closer to 156 than the 40 previously used. The assumption that people consume only the fish filet appears to be wrong, also. The recalculation of risk and cleanup goals could significantly change the scope of work and the technologies considered for remediation.

- Dioxin and furan chemicals were not tested for, nor did the LCP Site documents include available data. Without inclusion of the dioxin and furan data, an accurate risk assessment and remedial action plan cannot be completed. It appears the FS is based upon assumptions and not data concerning dioxin and furan, and ignores these chemicals would be additive to the cancer and non-cancer risks associated with PCBs due to the similar structure of the molecules and similar modes of action. Without the dioxin and furan data, the risk calculations can only be assumed to grossly understate the actual risks. Furthermore, with the addition of the observation that toxicity tests found unexplained levels of toxicity in the sediments, the incompleteness of the COC list might extend beyond dioxin and furans. At a minimum, the cleanup should be driven by the observed toxicity (empirical data) and not the modeling data. Empirical data always trumps modeling data. Modeling data should always be compared with the empirical data to

assure the model holds up to real world conditions at the Site. When sampling and analysis fail to identify the toxic compounds, the observed toxicity should drive the remedial decision-making.

- Technologies utilizing coffer dams, sheet piling, or other methods of confining sediments during remedial activities were not evaluated, even though the stakeholder agencies had identified these as preferred (NOAA, 2000). Furthermore, utilizing a containment structure and dry excavation method would have resulted in very significant changes in the approach to the remediation. 1.) Remedial Action mobilization and access to the marsh would have been from the uplands. 2.) "Marsh Disturbance Beyond Remedy (acres)" would have been minimized, as would the potential to re-suspend COCs and distribute throughout the marsh or remediated areas. 3.) The project could be accessed from a single access point and single decontamination of equipment point established. 4.) Technologies using other than dredging could have been evaluated and implemented. Notable is coffer dams were previously used at the LCP Site during the EPA Emergency Response and Removal. The proposed remedial activities adjacent to the existing coffer dam and can be accessed from these previously remediated areas, and new temporary coffer dam structure could be built off of the existing structures.

- Areas identified as Marsh Disturbance Beyond Remedy (acres)" were not described in the FS. While the authors of the FS argue minimal disturbance is needed to preserve the marsh ecosystem, the technologies selected and the methods of implementation are prone to marsh disturbance, and all proposed remedies "disturb" more acreage than is being remediated. Significant potential to disturbed COC contaminated sediments exists but could not be evaluated due to these areas not being identified.

- The source areas were not sufficiently described and significant data gaps were evident, including but not limited to the following:

- Spartina was not analyzed, investigated, or evaluated as a source of COCs in the marsh. Spartina is the base of the marsh food chain, known to bioaccumulate COCs present from the LCP Site, and appears to be intentionally avoided for remediation. Therefore, the FS appeared to be "fatally flawed" and detached from the realities of a Spartina-based marsh ecosystem.

- The depth of sediment samples was less than the expected depth of COCs in the marsh. It appeared the sampling was conducted with a maximum remedial depth already determined.

- The depth of bioturbidation was not accurately described or quantified. The authors of the FS did not appear to grasp the importance of knowing and identifying the biota causing bioturbidation, the depth of disturbance, and the quantity of sediment brought to the surface on an annual basis. Particularly with remedies considering capping, fully quantifying bioturbidation and the potential impact to the remedy is crucial. The lack of any such evaluation of bioturididation strains the credibility of the FS and questions the FS authors understanding if a Spartina-based marsh ecosystem inhabited by burrowing biota.

- Keystone ecological species are missing from the documents used to develop the FS. These include mink, dolphin, manatee, and diamondback terrapin. Notable is the large volume of data available on the resident and transient dolphin population, which is conspicuously missing from the FS decision-making process (Balmer, 2011; Balmer, 2013a; Balmer, 2013b; Hart, 2012;

Hickie, 2013; NOAA, 2013; Pulster, 2005; Pulster, 2008; Schwacke, 2012). The LCP Site documents utilize the dolphin data to argue for sampling and analysis of only Aroclor 1268 with the dolphin studies, but failed to also realize the ecological impact or include this data in the BERA. The selective nature of data usage throughout all the documents supporting the FS is very noticeable.

- Noticeable is the FS does not contain measurable goals for assessing the recovery of the eco-system or a timeline to take goal measurements and conduct evaluations. Even more noticeable is the exclusion of the keystone species by which a remedial action would be assessed and the recovery measured. These species include mink, diamondback terrapin, and dolphin, and would cover mammal marine mammal, and reptile. An avian and herbivore indicator species should also be included. A full suite for seafood species should be analyzed on an annual basis, and whole, filet samples of juvenile and adult specimens collected and analyzed for a full suite of COCs. Dioxin and furan should be analyzed routinely at every sampling event and included on the COCs list.

- The FS does not identify actions to implement if the remedy fails to meet remedial goals on a set timeline. There is a three-part problem:

1. No measurable goals for the remedial action.
2. No timeline or measurement metrics for evaluating the remedial action.
3. No identified actions to be implemented if the remedial goals are not met by a specific date.

There were other indications the authors of the FS were significantly disconnected from the realities of the LCP Site, the conditions present on and around the Site, and in the community. These "disconnects" have the potential to be a significant threat to public health, and should not be taking lightly by the EPA or the community. When those charged with a cleanup upon which the public health and welfare is dependent show a profound lack of understanding of the situation, the EPA should move quickly and decisively to remove remedial activities from the Potential Responsible Parties and into the hands of a competent contactor. Furthermore, the EPA should order the contractor to move ahead with all due diligence and speed. The following are two examples of failures to understand the public health crisis at the LCP Site.

<u>Example One:</u>

> "All alternatives include institutional controls such as fish consumption advisories."
>
> "Providing information that helps modify or guide human behavior and enhance protectiveness at a site, such as notices, signage, and fish consumption advisories that maybe required until RAOs are met."

The FS authors suggest they can modify or guide human behavior to enhance protectiveness. Again, the authors are either disingenuous or delusional (or both) in making this statement. If human health could be protected in such a manner, the only responsible action would have been to implement these measures (information, notices, signage, and fish consumption advisories) immediately upon learning about the risk to human health. As previously noted in comments on

the HHBRA, the EPA, Georgia Department of Natural Resources, and the Potentially Responsible Parties have failed, to implement the recommended action made by ATSDR over the past 20 years.

In light of the EPA, Georgia Department of Natural Resources, and the Potentially Responsible Parties failure to implement recommendations by the ATSDR to protect human health since issues 21 years ago, why should anyone believe any of these agencies or parties are capable or will now do so at this time?

Is it arrogant to suggest the Potential Responsible Parties have the power to guide or modify human behavior?

What evidence (studies or reports) are presented to suggest there has been any success in implementing Institutional Controls over the past 20 years?

What is the budget for implementing Institutional Controls until the cleanup goals are reached?

What has been the budget for these Institutional Controls over the past 20 years?

Example Two:

> **"Section F-1 Contents: Excerpt from GADNR Fish Consumption Advisory Threshold Memorandum**
>
> "This section is an excerpt from the GADNR technical memorandum identifying the dietary thresholds used by GADNR to establish fish consumption advisories for the TRBE. The edible fish and shellfish tissue data provided in Section F-3 are compared to these thresholds. These thresholds are not appropriate for comparing to the whole-body fish tissue data provided in Section F-4 **because anglers do not consume the whole-body fish samples, only the edible tissues."(emphasis added)**

As noted in real world survey of coastal Georgia fish consumers, the following consumption habits were documented (ATSDR, 2014b).

- Filet with skin removed -11%
- Filet with skin on – 33%
- Whole fish (gutted) – 56%
- Whole fish (not gutted) – 11%
- Fish eggs – 44%

It is clear the authors are interjecting opinion and not scientific fact into the FS for the sole purpose of reducing the apparent level of risk. Obviously, the real world scientific data from Coastal Georgia shows at least 56% of people eat the whole fish, and only around 11% eat fish in the manner described in the FS. Also noticeably missing from the LCP Site records are data about fish eggs, which are high lipid seafood prone to accumulating site COCs. Interestingly,

fish eggs were sampled and the results reported in the 2008 ATSDR Health Consultation for the Arco Quarry (ATSDR, 2008). In addition to Aroclor 1268 being found in the fish eggs, it was present at a level an order of magnitude (X10) than in fish tissue. Other notable coastal Georgia delicacies are smoked mullet and mullet roe, which also deserve sampling and analysis for the Site COCs, and are noticeable missing from Site documents. But the point of the above discussion and data is to clearly identify the need to accurately identify the human health risks at the LCP Site and produce a FS that stands up to the real world facts as they are. Currently, the situation is an imminent risk to human health and the environment, and the EPA and PRPs have failed to produce a viable remedial plan to rectify the situation.

Does the EPA agree the authors of the FS are interjecting opinion with statement like, "because anglers do not consume the whole-body fish samples, only the edible tissues"?

Does the EPA agree that people in coastal Georgia do eat the whole fish, and not just the filet?

Does the EPA realize the fish eggs potentially have significantly higher levels of LCP Site COCs than the fish filet?

Did the FS or other LCP Site documents evaluate the consumption of fish eggs or other high lipid content seafood?

Was the EPA aware of the cultural seafood consumption practices in coastal Georgia such as fish eggs (roe), whole fish, and other methods of cleaning and preparation? If not, why not?

Would the findings about cultural seafood consumptions patters be significant and warrant inclusion in the HHBRA?

Proposed Plan Comments and Questions

The following comments are on the full Proposed Plan. The quote from the proposed plan is followed by the comment or question for the EPA to respond to in the Responsiveness Summary for the LCP Chemicals Superfund Site for Operable Unity One, the Marsh. In addition, as a community member and one of the persons who has used Purvis Creek for recreation, and intends to continue to use Purvis Creek for recreation, the area needs to be cleaned up, made safe for all uses, and the seafood be safe to catch and consume.

Introduction

> "The Plan summarizes information that can be found in greater detail in the RI/FS reports and other documents, which present the results of sampling conducted from 1995 through 2012."

Was there a compelling reason for the EPA to exclude data collected after 2012? Why not include data to date?

Site History

> "The Dixie Paint and Varnish Company operated a paint and varnish manufacturing facility at the Site from 1946 to 1956."

Honeywell contends in their Fact Sheet the paint contained Aroclor 1268. What documentation does the EPA have to support the contention that Aroclor 1268 was an ingredient in paints manufactured by Dixie Paint and Varnish Company?

Public Participation

> "The Region also publishes the quarterly *Brunswick Environmental Cleanup Newsletter* to update the public on the cleanup progress at the LCP Chemicals Site and the three other Superfund sites in the Brunswick area."

The Glynn Environmental Coalition is very concerned about the public participation process at the LCP Chemicals Superfund site. At the December 4, 2014 EPA public meeting Ms. Angela Miller, EPA Community Involvement Coordinator, stated that the mailing list for the LCP site have been deleted. In light of this statement please list the dates of the quarterly *Brunswick Environmental Cleanup Newsletter*, and the number of people the newsletter was sent to. In addition, I asked Ms. Miller why I had not received a copy of Proposed Plan via postal mail. Evidently this was due to the EPA community participation mailing list being deleted. Ms. Miller indicated that there was a considerable number of newsletters sent by the EPA being returned as undeliverable. During the same period, the Glynn Environmental Coalition (GEC) has been sending out Technical Assistance Reports (TAR) produced under the EPA Technical Assistance Grant (TAG) program for the LCP Chemicals Superfund site. Like the EPA, the GEC does receive a few newsletters back after each mailing, which we used to update the mailing list and keep the current as is required by postal regulations for organizations using a bulk mailing permit. By doing so we enable to maintain the continuity of the TAG mailing list even though many of the people have moved over the 18 years we've administered the TAG.

Please describe the EPA procedures for maintaining their community participation program for the LCP Chemicals Superfund site, including:

Does the EPA maintain a mailing list for the LCP Chemicals Superfund site?

Does the EPA use the returned newsletters to update the LCP Site mailing list?

If not, how does the EPA maintain the mailing list and keep it current, and maintain continuity in community participation at the LCP Site?

How many EPA quarterly newsletters have been sent out over the past three years at each mailing, and what were the dates of the mailings?

When the LCP Proposed Plan was released, how many were mailed to the community?

In light of the report from Ms. Miller that the LCP mailing list have been deleted, how did the EPA formulate the mailing list to send out the Proposed Plan?

Was the Proposed Plan sent to all the people who have signed up for on the EPA's mailing list for the LCP Site? If not, how many (what number) of the people who have previously signed up to the LCP Site EPA mailing list did not receive the Proposed Plan mailing?

What are the EPA's plans to assure future continuity in the mailing list for public participation at the LCP Chemicals Superfund site?

Is it possible for the EPA to recover the deleted mailing list and updated with returned newsletters or other mailings concerning the LCP Chemicals Superfund site, or other Superfund sites, in Glynn County?

How many addresses were on the list that was deleted?

Does the EPA keep a record of the Glynn County Superfund Site the person has signed up to receive information about from the EPA?

Can the EPA assure that there will be a mailing list maintained for the community participation in the decision-making process for the citizens of Glynn County from now and into the future, and will be available for the other propose plans and records of decisions that will be coming up for the Superfund sites in Glynn County?

The EPA provided the documents and materials in support of the LCP Chemicals Superfund Site Proposed Plan to the repository at the Brunswick Library on December 3, 2014. The EPA held their public meeting the following day on December 4, 2014. This resulted in giving the community one day to review 8700 pages. Taking into account the average work days eight hours, this would've left 3.3 seconds per page for the public to read the document. This does not include the time it would take to prepare comments for submittal at the EPA public meeting.

Does the EPA feel it is appropriate to allow 3.3 seconds per page for the public to read the documents the EPA provided?

How much time does the EPA feel is appropriate for the community to review 8700 pages, prepare comments, and be ready for the EPA Public Comment Meeting to submit comments to be taken down by a court recorder?

Was the purpose of releasing 8700 pages 24 hours before the Official EPA Public Comment Meeting to thwart any meaningful community comments at the Official EPA Public Comment Meeting?

How many requests for another EPA public comment meeting have been received by the EPA?

Have the Congressional representatives of Glynn County requested the EPA provide a public comment meeting for the LCP Chemicals Superfund site marsh proposed plan?

Does EPA feel it is appropriate to limit participation in decision-making process to those with access to the internet, email, or innate ability to write comments to participate in the decision-making process?

1.3 Setting and Hydrodynamics of the Marsh

> "The intertidal vegetated marshes are a net depositional zone for suspended sediments due to the low current velocities and presence of vegetation within those areas. "Net depositional" means that particles are more likely to settle than to scour from the area."

What data is presented in support of this statement? How much sediment has accumulated or eroded from the LCP Site?

If the LCP marsh has a net deposition of particles, what is the annual deposition rate?

> "The Turtle River water surface elevation can vary in excess of nine ft during a tidal cycle."

Are these tides consistent with an area with "low current velocities"?"

What are the tidal ranges for the St. Simons sound estuary under storm conditions such as a northeast wind?

How does the wind effect currents in the estuary and on the tidal flats?

Figure 1, Figure 2

Why is the Salt Dock area not shown as part of the LCP Site?

How were the LCP Site boundaries shown in Figure 2 determined?

With the boundaries of the LCP Chemicals Superfund site determined by land ownership or by the extent of the contamination?

Are Superfund sites boundaries supposed to be determined by the extent of contamination or the surveyed ownership lines?

Past Actions

> "The approximately 13 acres of highly contaminated marsh sediments were excavated, backfilled with clean fill, and re-vegetated with native marsh grasses."

Why is marsh removal and re-vegetation with native marsh grasses not part of the Proposed Plan?

Were coffer dams used during past actions?

If coffer dams were used in the past, why was this technology not considered in the Feasibility Study?

What was the decision-making matrix that leads the exclusion of all technologies deployed from the uplands or utilizing dry excavation techniques?

> "As a result of these removal actions, the remaining contamination in OU1 is considered to be low-level threat waste to be addressed by this Superfund remedial action."

Is there only "highly contaminated…" and "low level threat…" wastes at the site?

Who made the determination that the remaining wastes are "…low-level threat waste"?

What is the definition of low-level threat waste?

What is the difference between waste and COCs?

How does the EPA quantify low-level threat waste and what is the threat level to humans and wildlife?

What are the numerical difference between low level, mid-level, and high level wastes for the Chemicals of Concern (COC) at the LCP Chemicals Superfund site?

Where can the low, mid, and high levels of waste threats definitions be found in EPA rules and regulations?

Mr. Franklin Hill of the Superfund branch at EPA Region 4 has publicly stated in an Atlantic Journal-Constitution Op-Ed that there is only residual contamination at the LCP Chemicals Superfund site.

How does the EPA defined residual contamination and how is that numerically quantified?

Would contamination that has resulted in documented sick Dolphins within this estuary qualify under the definition of residual contamination?

2.0 SITE CHARACTERISTICS

> "As a result of the RI studies and risk assessments, a limited number of contaminants were identified as **contaminants of concern** (COCs) (emphasis added) that warranted further evaluation and remedial action under CERCLA."

Were the COCs that have synergistic and similar modes of action considered, or were COSs like dioxin/furan excluded, even if they should be considered along with PCBs?

Were all PCBs included or were the others excluded and only Aroclor 1268 included?

If so, why?

If not, why is the data missing?

2.1 Distribution of COCs in Sediment

> "Figures 3 through 6 show the COC concentrations in surface sediment samples, defined as samples with a starting depth at the sediment surface and collected from the interval of 0-to-6 inches, or 0-to-1 ft below the sediment surface; the 0-to-1 ft interval was used when upper 6-inch intervals were unavailable."

Fiddler Crabs mix sediment up to 36 inches below ground.

Why was sampling limited to 6 or 12 inches?

Was the EPA or the PRPs unaware of the biosphere depth in the estuary that inhabits the marsh sediments?

Did the US Fish and Wildlife Service (USFWS) advise the EPA that sampling to only 12 inches was insufficient to delineate contamination in the LCP Marsh (USFWS, 1996)?

Did the USFWS advise the EPA to conduct whole body fish analysis?

Has the EPA assured whole body fish analysis has been conducted?

Did the USFWS note the Spartina root bed extends to 18 inches and COCs at this depth might have a higher propensity to be bioavailable (USFWS, 1996)?

How would the greater bioavailability of COCs at a depth of 18 inches affect a cap remedy?

Did the USFWS recommend in 1996 the EPA total "dioxin" levels reported for the nature and extent of the contamination within the marsh?

> "Two reference locations were used during the various ecological studies. One (Troup Creek) was located about 4.3 miles from the marsh, on the eastern side of the Brunswick

> Peninsula, and the other west of Sapelo Island, over 25 miles from the Brunswick area. The purpose of these reference locations is to collect data from areas presumed to have been uncontaminated with the LCP Chemicals Site, for the sake of comparison."

In light of the data collected since 2012, does the EPA agree the Reference Stations are likely, if not confirmed, to be within the radius of contamination deposition from the LCP Site (ATSDR, 2014b)?

If the EPA disagrees, what data does the EPA have to support continued use of the Reference Stations?

> "Methylmercury (MeHg) was measured at over 150 sediment sampling locations throughout OU1. The MeHg in sediment ranged from below detection limits to 0.05 mg/kg, with a mean concentration of 0.005 mg/kg. Only a small fraction of the mercury in sediment was present as MeHg. Because MeHg readily bioaccumulates, it is more prevalent and toxic in biota tissue and toxic than elemental mercury."

Does the EPA agree that there is only one sample of methylmercury for approximately every 4.5 acres of the LCP Site march? (640 acres/ 150 samples)

Is the reason a small fraction of the mercury was methylmercury because it readily bioaccumulates? If not, why not?

Figure 4 – Aroclor 1268 Concentrations in LCP Marsh Sediments

Why is there a high level of Aroclor 1268 reported at the Salt Dock in Figure 4?

Does this indicate dioxin/furan could have been transported to this area since the EPA and Honeywell argue the PCBs and dioxin/furan are co-located?

> "The distribution of COCs clearly points to the Eastern Creek, LCP Ditch and portions of Domain 3 Creek near the Site Uplands as major contaminant sources. In addition the Eastern Creek and LCP Ditch are more directly influenced by tidal action that can mobilize contaminants into Purvis Creek and beyond, much more so than contaminants in vegetated wetland marsh areas with very low tidal energy."

> "The high levels of MeHg and PCBs (primarily Aroclor 1268) detected in fish fillets resulted in a fish consumption advisory for the Turtle River/Brunswick Estuary (TRBE) issued by the Georgia Department of Natural Resources from 1995 to the present."

Why were fish not tested around the LCP Site and in Turtle River like they were at Lake Onondoga (whole, filet, juvenal and adult) and include dioxin and furans (USEPA, 2002)?

What Is Risk and How Is it Calculated?

> "A Superfund BRA is an analysis of the potential adverse effects caused by hazardous substances at a site under current and future conditions in the absence of any actions to control or mitigate these effects."

If the BRA is an analysis of current and future conditions, why does it use data 20 years old (DHHS, 1999)?

Did the ATSDR Public Health Assessment discredit the study used to establish the annual number of seafood meals used to determine risk (ATSDR, 2014a)?

Exposure Assessment

> "The high quantity fish consumer scenario evaluated exposures to individuals who consume more locally-caught fish, assumed to be 40 meals per year, than the typical recreational anglers."

If the BRA is an analysis of current and future conditions, why is it using data 20 years old (DHHS, 1999)?

Did the ATSDR Public health Assessment discredit the use of DHHS, 1999 with the following statement?

> "And finally, it should be noted that African-Americans made up only 4% (9 out of 211) of the people who participated in the study. African-Americans make up 26% of the population of Glynn County and nearly 40% of the population within four miles of the LCP Chemicals Site. Therefore, African-Americans are underrepresented in the Brunswick fish study.
> A study of fishers along the Savannah River showed that African-Americans
> • Eat more fish meals per month than whites (average, 5.4 vs. 2.9),
> • Eat slightly larger portions than whites (average, 13.7 oz. vs. 13.1), and
> • Eat higher amounts of fish per month than whites (average, 75 ounces vs. 41 ounces).
> It is reasonable to assume that the fish-eating habits of African-Americans in Brunswick, Georgia, are similar to African-Americans along the Savannah River. Therefore, African Americans who fish along the Turtle River are likely to have higher exposure to mercury from eating fish than whites. The results of the Brunswick fish study should not be applied to African Americans in the Brunswick area for those reasons." (ATSDR, 2014a)

Did the Sapelo Study of Chemicals in seafood consumer find an annual consumption rate closer to 156 meals per year (ARSDR, 2014b)?

> "Because risk assessments are designed to be conservative to ensure that risk management strategies will be protective of human health, as well as consistent with EPA requirements, two types of exposure scenarios were analyzed in the Baseline HHRA to assess the range of potential risk: the reasonable maximum exposure (RME), which

estimates the highest level of human exposure that could be reasonably expected to occur, and the central tendency exposure (CTE or "typical") scenario. Cancer and non-cancer health hazards were assessed under both these scenarios."

Does the EPA now realize the Baseline HHRA is seriously flawed?

<u>Toxicity Assessment</u>

"The Baseline HHRA provided detailed discussions on the toxicity of mercury and PCBs (Aroclor 1268) and their associated uncertainties."

Why is the additive effect from dioxin and furan not included in the discussion of associated uncertainties (EPA, 2000)?

Does EPA guidance instruct to include dioxin and furan in the analysis of the carcinogenic and non-carcinogenic effects of PCBs like Aroclor 1268 and the other PCBs found at the LCP Site (EPA, 2000)?

"Cancer risks: Cancer risks are only associated with Aroclor-1268."

Was the dioxin and furans known to be present in seafood and sediment evaluated in included in the Toxicity Assessment?

Does the EPA acknowledge the above statement is incorrect and there are cancer risks associated with dioxin and furans found in the LCP Site area and in Turtle River (EPA, 1996)?

"Non-cancer health hazards: The calculated RME non-cancer HIs ranged from 0.7 for consumption of shellfish to 8 for the child high quantity fish consumer. Adult recreational anglers would have a HI of 3 and the adult high-quantity fish consumer would have a HI of 5, both of which exceed EPA's acceptable level. Calculated CTE hazards exceeding the acceptable level are for child consumption of fish and shellfish and the high quantity fish consumer. The calculated RME non-cancer HIs ranged from 1 for the adolescent to 5 for the child."

Were this levels of risk based upon the discredited 40 meals per year (DHHS, 1999; ATSDR, 2014a)?

"There were no unacceptable health hazards or risks associated with lead or PAHs. The only two contaminants that contribute to unacceptable human health risks are mercury and Aroclor 1268."

Was dioxin furan data available to the EPA utilized in the Toxicity Assessment and factored into this statement?

Does the existing dioxin/furan data exceed the EPA allowable levels in seafood (GA DNR, 1989; GADNR, 1990; GADNR 1991; GADNR, 1992; GADNR, 1993; GADNR, 1994)?

> "For example, Table 3 compares the current average edible tissue concentrations from the Baseline HHRA with the calculated protective tissue goals for the adult recreational fish/shellfish/clapper rail consumer at a HI of 1 and cancer risks at 1E-04 and 1E-06. These numbers and others from the Baseline HHRA and those calculated as part of the State of Georgia fish consumption advisory for the TRBE can be used for future monitoring to achieve edible tissue levels that will be protective of human health."

Is Table 3 based upon the discredited data (DHHS, 1999; ATSDR, 2014a)?

4.2 Ecological Risks

> "The COCs quantitatively evaluated in the BERA included mercury, Aroclor 1268, lead, and PAHs."

Was available dioxin and furans data included in the evaluation? If not, why not?

> "The results from tests on amphipods that burrow into the sediment indicated toxic effects in up to 85 percent of sediment samples from the LCP Chemicals marsh. However, toxicity was also observed in several reference samples from Troup Creek. Toxicity tests with grass shrimp (that generally float above the sediment) showed toxic effects in up to 69 percent of the samples, including those from reference stations. A detailed analysis of potential causes of the toxicity was presented in the BERA, along with the conclusion that, in addition to the COCs in sediment, various other non-measured factors likely influenced the tests, such as sulfide and organic carbon content, redox conditions, sediment pH, grain size, and potential pathogens in the test chambers."

In light of the toxicity sampling by the US National Park Service at Fort Puaski and Cumberland Island that did not find toxicity, does the sampling from the Reference Stations indicate they are toxic due to chemicals from the LCP Site, or failure of the lab to use appropriate protocols?

When questionable results are encountered, it is appropriate to repeat the test or do an analysis of the sediment to identify the toxic chemical or pathogen?

Did the EPA find any significance in the sediments being toxic to both burrowing and non-burrowing biota?

> "Table 4 summarizes the SEC concentrations based on the five statistical measures for the most sensitive toxicity tests (amphipod survival and grass shrimp embryo development). Although the data indicates a wide range of effect concentrations with low accuracies (**generally much less than a 50% chance of being correct** (emphasis added)), the SECs chosen were among the more reliable and accurate for these sensitive endpoints. Other test endpoints such as reproductive response and embryo hatching

resulted in higher SECs and even less accuracy. The SECs presented in Table 4 provide the basis for development of preliminary remedial goals."

Is it scientifically acceptable to the EPA to use data with a less than 50% chance of being correct to establish preliminary remedial goals?

Is the likelihood of the Proposed Plan working less than 50%?

If the data used has a likelihood of being less than 50% correct, how can a Proposed Plan based upon that data be any more correct or likelihood of success be anymore than "less than 50%"?

When questionable science is encountered, is the normal procedure to repeat the experiment to find the variables causing the low chance of being correct?

Is it correct to conclude the EPA saying the data being used has much less than a 50% chance of being correct?

"The LOAEL HQs suggest persistent low-level chronic effects."

What are the persistent low-level chronic effects expected to be present in the LCP Site marsh?

"None of the LOAEL HQs were exceeded for the redwing blackbird, marsh rabbit, raccoon and river otter, indicating minimal risks."

How many marsh rabbit, raccoon and river otter were sampled?

How many studies documented the population dynamics of marsh rabbit, raccoon and river at the LCP Site?

If none were conducted, why not?

Does the EPA have any empirical evidence or baseline monitoring to compare with the LOAEL HQs?

How does the EPA propose to evaluate the Remedial Action?

Has any data been collected to evaluate the upcoming Remedial Action or is all the data presented for the decision-making based upon models and assumptions?

If models and assumptions, when will baseline data (Baseline monitoring data) be collected for evaluating the remedy effectiveness?

Table 5. Summary of Risks to Wildlife Receptors

> "Diamondback terrapin None < 1 < 1 None"

Please explain how the EPA can conclude a HI or HQ less than 1 when empirical data reported reproductive failure (EPA, 1997)?

Uncertainties Related to the BERA

> **"** The evaluation of potential adverse effects to the benthic invertebrate community relied on hundreds of site-specific acute and chronic toxicity test measurements using both indigenous and laboratory-cultured organisms. The OU1 BERA notes that the development of PRGs for the protection of benthic invertebrates is "**highly uncertain with poor accuracies"** (emphasis added) and that "only conservative assumptions were used" for this purpose;"

Why is data that is "highly uncertain with poor accuracies" being used in the proposed Plan?

When science is unreliable, is the appropriate action to repeat the data collection, analysis, or experiment?

Uncertainties Related to the Dioxin and Furans

Why does this section ignore and not report the large volume of dioxin and furan data available for this area of Turtle River (GA DNR, 1989; GADNR, 1990; GADNR 1991; GADNR, 1992; GADNR, 1993; GADNR, 1994)?

> "During the remedial design, areas outside the remediation footprint chosen will be sampled for dioxins/furans to ensure that any unacceptable risk is addressed."

Why does the EPA feel it is so important to avoid dioxin and furan sampling until after the Proposed Plan, Record of Decision, and the Consent Decree is entered into and approved by the court?

How will the EPA know what the "Remedial Footprint" is without the dioxin and furan data?

Would the dioxin and furan data be additive to the PCB risk assessment data for humans and wildlife?

How could this dioxin and furan data significantly change the Proposed Plan?

Could the unexpected toxicity observed be due to the very toxic dioxin and furan?

Could dioxin and furan be the variable that is accounting for the "…generally much less than a 50% chance of being correct…" noted in Section 4.2 Ecological Risks?

If not, what is the factor causing the large disparity?

As noted in the section of the LCP Site Proposed Plan, "Relationship between Dioxin/Furans and Chlor-alkali Sites"**:**

> "At the Onondoga Lake Site, while dioxins/furans were determined to be both human health and ecological risk drivers as a result of fish consumption in Onondaga Lake,…"

Since this Onondaga Lake site is being used as a comparison site and as an argument to NOT test for dioxin and furan until after the Record of Decision and Consent Decree, why did the EPA NOT use the human health and ecological risk drivers found at Onondaga Lake in the LCP Site in Brunswick Risk Assessments?

Why did the EPA NOT do the same sampling at the LCP Site in Brunswick as at the Onondaga Lake Site?

Unlike Lake Onondaga, was dioxin and furan found widely distributed in the Turtle River and the St. Simons Sound estuarine system sediments (USEPA, 1995b)?

<u>Relationship between Dioxin/Furans and Chlor-alkali Sites</u>

The EPA's interjection of the Onondaga Lake LCP Site near Syracuse New York into the decision-making process for the LCP Site located in Brunswick Georgia presents an interesting situation. In order to compare and contrast the two sites the similarities and differences will need to be identified. In addition when similarities are found it will be interesting to note if the lessons learned have been applied to the LCP site in Brunswick Georgia.

> " The dioxins/furans and Aroclor 1268 sediment data collected to date show a strong relationship between dioxins/furans and Aroclor 1268 concentrations. A similar relationship was found at the Onondoga Lake and Ninemile Creek Superfund sites in upstate New York. **At the Onondoga Lake Site, while dioxins/furans were determined to be both human health and ecological risk drivers as a result of fish consumption in Onondaga Lake,** (emphasis added) they were not found to be widespread in lake sediments. The New York State Department of Environmental Conservation (NYSDEC) sediment screening criteria for protection of wildlife and humans from bioaccumulation were used as comparison values for the dioxins/furans. The areas where dioxins/furans are elevated are generally co-located with areas that exceeded the lake cleanup criteria for other contaminants, which are being addressed under the lake remedy.
>
> There was a similar situation with the Ninemile Creek Site and a similar approach was used. Dioxins/furans also contributed to Site risks but they exceeded the NYSDEC bioaccumulation screening criteria at only three of the 194 creek sample locations. These locations would be remediated based on concentrations of other detected contaminants (e.g., mercury).

Therefore, Site preliminary remediation goals for dioxins/furans in sediments were not developed."

At the Onondaga Lake site EPA found the dioxin and furans were a human health and ecological risk driver. But at the LCP site in Brunswick Georgia dioxin has not been considered as a risk driver in either the ecological or human health risk assessments.

Why has the EPA failed to apply the risk found at the LCP site in New York to the ecological and human health baseline risk assessments for the LCP site in Brunswick, Georgia?

Are the two Sites really similar and if so in what ways?

- **What are the similarities or differences in salinity ranges at the Lake Onondaga site when compared to the Brunswick Georgia site?**
- **What is the title range at the Lake Onondaga New York site compared to the Brunswick Georgia site?**
- **What is the rainfall at the Lake Onondaga New York site when compared to the Brunswick Georgia site?**
- **One of the water temperature ranges at the Lake Onondaga New York site when compared to the Brunswick Georgia site?**
- **What is the annual temperature ranges for the Lake Onondaga New York site when compared to the Brunswick Georgia site?**
- **Are the fish species found at Lake Onondaga New York site the same as those found at the Brunswick Georgia site?**
- **Does Lake Onondaga in New York have a Spartina marsh like at the LCP site in Brunswick Georgia?**
- **What is the water current speed in Ninemile Creek in New York and the current speed in Purvis Creek at the LCP site in Brunswick Georgia?**
- **Do people fish from Lake Onondaga in New York and from Turtle River near the LCP site in Brunswick Georgia?**

To my knowledge, the only similarity between the Lake Onondaga New York site in the Brunswick Georgia LCP site is that people consume fish from both the lake and Turtle River.

Does the EPA agree the only similarity between Lake Onondaga and Turtle River is people catch and eat fish from both locations?

Does the EPA agree the dioxin and furan is more widely distributed in the Turtle River area than at Lake Onondaga, and the EPA's data documents this dispersion (USEPA, 1995b)?

Will the EPA add the risks found from dioxin and furan in fish to the BERA and HHBRA for the LCP Site in Brunswick, Georgia? If not, why not?

As noted in the BERA:

In addition, Aleiandro et al., (2006) states that some of the Clapper Rail effects observed may be attributable to "organochlorides other than PCBs (e.g. dioxins)." Kannan et al., (1998a,b) also associate dioxin-like compounds to the Site. These papers suggest dioxins/furans may be associated with the Aroclors at LCP. The magnitude of the TEC dioxin concentrations particularly in Eastern Creek suggests collocated contamination with Aroclor 1268. In the absence of TEC-dioxin data in sediment elsewhere in the estuary or in biota samples, the potential contribution of TEC dioxins to existing risk is unknown.

Does the noted uncertainty, "…the potential contribution of TEC dioxins to existing risk is unknown", still exist?

Since the EPA has proposed a plan to remediate the LCP site in Brunswick Georgia without any dioxin furan data or any dioxin furan risk calculations for wildlife or people who consume the seafood, will the risk data from the Lake Onondaga site be used at the Brunswick Georgia site to better estimate the additive risk of dioxin and furan to the existing PCB contamination?

5.0 REMEDIAL ACTION OBJECTIVES (RAOS) AND PRELIMINARY REMEDIAL GOALS (PRGS)

The most conservative potential sediment PRG would be one which protects humans at an upper bound excess cancer risk of 1E-06, based on consumption of fish with Aroclor 1268. However, this would require a sediment clean up goal of 0.037 mg/kg, which would result in destruction of almost 700 acres of **otherwise functioning marsh** (emphasis added) and was therefore rejected as a potential goal.

What data does the EPA have to support the statement that the LCP Site is "…otherwise functioning marsh…"?

"Similarly, if a 1E-05 cancer risk were used as the basis for establishing a sediment goal, the Aroclor 1268 concentration would need to be 0.37 mg/kg, which would result in unwarranted harm to approximately 586 acres or 77% of the entire marsh."

How large is the entire marsh in the Turtle River (St. Simons Sound)?

Would remediating to 1E-05 result in removing the entire marsh, or just the contaminated areas adjoining the LCP Site?

"Early in the feasibility study process, EPA and GAEPD concluded that achievement of a mercury SWAC PRG of 1 mg/kg for the entire marsh would not be appropriate."
And,
" EPA and GAEPD reached this conclusion after thoroughly evaluating whether the removal or treatment of sediment contaminants in 33 of the 81 acres would cause more long-term ecological harm than no active remedial action, since such a large remedial foot print would cause widespread physical damage to habitat and species."

How did the EPA and GAEPD come to the conclusion that achievement of a mercury SWAC PRG of 1 mg/kg for the entire marsh would not be appropriate and what were the decision-making metrics?

What timeframe did the EPA and GAEPD consider long-term ecological harm?

How long will the mercury remain in the marsh and continue the methylation process?

How long will it take to remove the mercury contaminated marsh and complete the restoration process?

When comparing leaving the mercury in place and the continued methylation process or removing the mercury contaminated sediments and restoring the marsh, which alternative results in the shortest impact to the marsh and estuarine system when considered over the long-term?

6.0 DESCRIPTION OF ALTERNATIVES

The proposed plan section concerning the description of alternatives is more notable for what's missing than what is discussed. In 2000, a preliminary restoration scoping analysis was conducted for the LCP Chemicals Superfund site marsh (NOAA, 2000). During this analysis many more remedial technologies were examined them were mentioned in the feasibility study or brought forward in the Proposed Plan. The technologies considered include, but are not limited to, the following:

- Controlled placement of multilayers with or without geosynthetic fabrics
- Solidification or stabilization biomechanically mixing the upper layers of the sediments with stabilizing or solidifying agents, which typically uses cement bentonite or polymer-based materials. The discussion of this technology include the use of containment structures such as coffer dams and caissons.
- Bioremediation by stimulating indigenous microbial activity with nutrients are introduction of design microorganisms. This technology was not found applicable for Mercury and PCBs. Also, consistent mixing and Spartina marsh would've been difficult.
- Mechanical including clamshell buckets, backhoes, bucket ladder, or similar technology. The drawbacks identified where the need for construction of berms, walls and silk curtains, and proper installation would require an effort similar to a dry excavation. But it was noted the typical drawbacks to dredging including site access and adequate space for sediment handling are not in issue for the LCP site.
- Dry excavation with a berm damn or dike marsh areas, followed by draining excavation is sediments and backfill, moving the berms and replanting was identified as a technology suitable for the site. Furthermore the technology was identified as being more efficient, reduced loss of sediments, and complete removal of the contamination when compared with dredging techniques.

The failure of the proposed plan to evaluate technologies utilizing coffer dams, sheet piling, berms, or dikes is an oversight that brings in the question the completeness of the Proposed Plan. Notable is the number of similar structures within the area of the LCP site. These include the aeration basin at the adjoining pulp and paper mill, the dikes at the Andrews island dredge spoil area, and even the existing road out to Purvis Creek at the LCP site. Furthermore, it is evident that the authors of the Feasibility Study failed to see the usefulness of the existing roadway (LCP Site causeway) as a significant containment structure within the area needing remediation. Placement of a coffer dam or sheet piling would be a very doable technology for the LCP site. The area can be accessed from the uplands, the spoils brought to the uplands, and a single point of entry and exit established for the purpose of decontamination.

What was the rationale of the EPA in excluding technologies that utilized coffer dams sheet piling or similar technologies to confine the area, reduce sediment dispersion, and facilitate dewatering of the sediments needing removal?

Did the EPA compare technologies utilizing dredging versus coffer dams or sheet piling?

If the EPA did compare the technologies, why were technologies that left contamination in place or that have a high probability of recent spending sediments selected?

Did the EPA consider accessing the marsh via an upland route instead of by barge?

Was a barge used previously for the EPA Emergency Response and Removal or was the marsh accessed via the uplands?

7.1 Overall Protection of Human Health and the Environment

> "These reductions are likely to be observed only after several years post remediation (i.e., after a few generations of fish lifespans)."

How many years is "…after a few generations of fish lifespans"?

Which fish species are being used to determine "fish lifespans"?

7.3 Long Term Effectiveness and Permanence

> "Sediment removal, sediment capping, and to a lesser degree thin-cover placement have been found reliable and effective at sites similar to the LCP Chemicals marsh."

What example of a similar marsh or estuary with *Spartina alterniflora* is being referenced as the example? Do the "…sites similar to the LCP Chemicals marsh" have tides in excess of 9 feet, Fiddler crabs, and other burrowing birds and animals?

> "Materials for sediment capping and thin-cover placement will be sized to ensure protection against erosion and scour. However, the thin cover is not an armored contaminant barrier. Based on several case studies, some burrowing and other types of

biological activities will occur in the thin-cover layer, but are not expected to adversely impact its effectiveness in reducing exposures to the benthic community. Monitoring and maintenance will be performed as necessary to ensure long-term remedy effectiveness."

How will the cap reducing exposures to the benthic community with the 200 Fiddler Crabs per square meter, documented in the BERA, burrowing to a depth of 36 inches?

Will the cap be compromised by approximately 8% per year?

If not by approximately 8% per year, how much sediment will be brought to the surface each year by the 200 Fiddler Crabs per square meter?

What are the other burrowing animals that will further compromise the cap materials?

"Monitoring and maintenance will be performed as necessary to ensure long-term remedy effectiveness."

How often is the monitoring schedule to take place at the site and what will this entail?

How often will maintenance be performed and how will the areas be accessed?

Will funding be in place to conduct the monitoring and maintenance or will it be contingent upon approval and appropriations by the PRPs or in the case of the EPA, Congress?

How much money will be set aside for the monitoring and maintenance program?

Does the EPA the description of the monitoring and maintenance program in detail is critical to the success of the remediation?

If so, please do describe in detail and include in Responsiveness Summary and the Record of Decision.

"Where alternatives include sediment capping and thin-cover placement, long-term COC toxicity and mobility are reduced by creating a clean sediment surface through burial with clean materials."

How can the EPA claim "…long-term COC toxicity and mobility are reduced by creating a clean sediment surface through burial with clean materials", when the marsh is occupied by 200 Fiddler Crabs per square meter burrowing to a depth of 36 inches?

7.4 Reduction of Toxicity, Mobility, or Volume (TMV) through Treatment

"In Purvis Creek, In Purvis Creek, there is evidence that mercury fish and shellfish tissue concentrations have decreased over time.."

Does the EPA have whole fish sampling in support of the statement, "In Purvis Creek, there is evidence that mercury fish and shellfish tissue concentrations have decreased over time," or is this an opinion or based upon data that is not comparable or obtained by different sampling and analysis methods?

What is the source of the data of "evidence" the EPA is citing?

What are the two data sets being compared to conclude there is evidence of COC reduction in fish and shellfish to make this conclusion and where can they be found in the LCP Site documents?

Was the data collected used to conclude there is evidence of a reduction using EPA approved protocols?

Was both whole fish and filet sampling conducted?

> "The thin cover is not intended to function as an absolute contaminant barrier, but as a layer which will stimulate ongoing natural recovery processes. Therefore, some possible bioturbation beyond the cover depth is not expected to diminish the effectiveness of this remedy and would not preclude its beneficial use as a component of a protective remedy."

Where can the EPA's calculations for the bioturbation beyond the cover depth be found in the Feasibility Study?

Is the thin cover based upon data or what is expected?

Who is defining "what is expected" and what are their credentials to do so?

How much sediment is brought to the surface each year by 200 Fiddler Crabs per square meter?

What is the volume of sediment brought to the surface each year by the other burrowing animals in the marsh?

> "Capping and thin-cover placements, which leave contaminant material in place, isolate COCs and reduce bioavailability and mobility through burial with clean material."

How can the EPA claim "… isolate COCs and reduce bioavailability and mobility through burial with clean material.", when the marsh is occupied by 200 Fiddler Crabs per square meter burrowing to a depth of 36 inches?

What is the cap annual failure rate calculated by the EPA, and the associated reintroduction of COC to the biota?

"Residual risks posed by COCs left un-remediated are addressed through ICs (including permit requirements, which are already in place to limit use or future activities in the LCP Chemicals marsh and fish consumption advisories) and LTM."

A discussion of the EPA's history of implementing Institutional Controls is in the comments submitted on the HHBRA and incorporated herein by reference.

7.5 Short-term Effectiveness

> "These negative impacts primarily relate to extensive heavy equipment used for dredging and the transport of contaminated sediments through the community to an uplands disposal facility and clean material transport to the Site."

Was on-site treatment, the use of coffer dams of sheet pilling considered by the EPA or stakeholder agencies (USFWS, 1996)?

Were coffer dams used by the EPA during the removal action for the LCP Site dump during the Emergency Response and Removal Action?

Are coffer dams a proven technology at the LCP Site?

Did the EPA use coffer dams during the Emergency Response and Removal Action to keep sediments from entering the marsh and spreading further?

Did the EPA use coffer dams during the Emergency Response and Removal Action to control and contain tidal waters?

7.6 Implementability

8.0 PROPOSED CLEANUP LEVELS

> "The derivation of the ecologically-based CULs was also a complex process that involved consideration of the ecological relationship of the affected areas of remedy implementation to the surrounding habitat, the recovery potential of the affected ecological receptors, and the magnitude of current and predicted future effects of the COCs on local populations within the marsh."

Were ecological receptors such as dolphin, manatee, diamondback terrapin and mink considered in the derivation of the ecologically-based CULs? If not, why not?

Does the EPA realize the dolphin, manatee, and mink are either species very susceptible to the COCs from the LCP Site, protected species, or both susceptible and a protected species?

Was the EPA aware of the large amount of peer reviewed journal data concerning COCs in dolphins and people prior to the release of the Proposed Plan (ATSDR, 2014b)?

> "Further, it was clear that not all discontinuous or isolated sediment locations that exceed PRGs could be removed without causing more harm than benefit."

Where can the "Harm/Benefit" analysis be found?

What was the timeline utilized to evaluate harm verses benefit?

Was short-term harm and restoration evaluated against the alternative of no action and long term risk to the ecosystem and human health?

What were the specific decision-making metrics used for the harm/benefit analysis?

What technologies were explored for these isolated high levels of COCs areas or areas that exceed remedial action goals?

> "In accordance with the EPA's risk assessment guidance, the initial PRGs were based on the most conservative estimates, using the most sensitive sediment toxicity receptors and test endpoints. The range of mercury SECs was between 1.4 and 145 mg/kg. For Aroclor 1268, the SEC range was between 4 and 420 mg/kg. Similarly for PAHs and lead, the SEC concentrations ranged over an order of magnitude."

Did it occur to anyone in any of the stakeholder agencies that there is likely another COC causing the observed extreme range in toxicity?

> "After evaluating each alternative that was presented in the FS, it was determined that the proposed CULs would still provide substantial protection to the benthic community without undue harm to the existing marsh, especially in combination with a robust monitoring program."

What does a "robust monitoring program" entail?

How often would the "robust monitoring program" be conducted?

Where are the sampling locations for the "robust monitoring program"?

When would the sampling and analysis start, and how long would the "robust monitoring program" be continued under the Record of Decision and Consent Decree?

Will dolphins, mink, and manatees be part of the "robust monitoring program"?

Has the EPA or the PRPs done the needed baseline monitoring over the past 20 years needed for a "robust monitoring program"?

If not, why should anyone believe the EPA or PRPs will start to do so now?

What does the EPA or PRPs have to show for work over the past 10 years to indicate they are competent to perform a "robust monitoring program"?

Has the EPA or PRPs collected the baseline data for a monitoring program? If not, why not?

Does a monitoring baseline need several data points to track changes, which requires several sampling events over time to establish the baseline?

> "Each of the SWAC and benthic community proposed CULs are expected to result in the attainment of the RAOs. In addition, surface water criteria that are identified as chemical-specific ARARs are expected, over time, to be attained as a result of dredging and capping of contaminated sediments."

What is the time period for attainment of the RAOs?

When will the effectiveness of the remedy be evaluated?

> "Where CULs may not be achieved and residual risks in some areas may occur, CERCLA and the NCP requires monitoring no less than every five years after implementation of the final remedy. Given that COCs will be left in place, a robust monitoring program, with triggers for additional actions, will be implemented as part of the selected remedy for OU1 to monitor and ensure success of the selected remedy."

What is the time period, specific goals, the decision-making metric by which the goals will be determined, and follow-up that will be implemented if goals are not reached?

Why are the goals not specified in the Proposed Plan?

Why are the goal decision-making metric by which the goals will be determined and triggers for additional action implementation, or the actions to be taken, not specified in the Proposed Plan?

Why is there no baseline monitoring to use in establishing goals to be reached?

Why has there been no baseline monitoring over the past 20 years?

Will the time period to reach the goals be specified in the Record of Decision?

What specific actions will be taken if the goals are not reached?

Has an analysis been conducted to compare the cost of conducting a remediation that will have a higher likelihood of success verses the cost of a "…robust monitoring program…" and the highly likely need to remobilize and conduct another remedial action due to minimal removal and significant unknown toxicity found during toxicity tests?

Will multiple remedial action shave a greater impact on the marsh than one comprehensive removal action and restoration?

9.0 SUMMARY OF THE PREFERRED ALTERNATIVE

A summary of preferred alternative cannot be conducted due the data deficiencies identified in the comments on the Baseline Ecological Risk Assessment and the Human Health Baseline Risk Assessment, and failure to evaluate all the technologies previously identified for inclusion in the Feasibility Study.

10.0 COMMUNITY PARTICIPATION

Please see comments concerning the Public Participation section of comments on the Proposed Plan for identified deficiencies and recommendations.

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