September 10, 2015

Mr. Gary Miller
Remedial Project Manager
U.S. Environmental Protection Agency
Fountain Place 12th Floor, Suite 1200
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: GBF/HARC comments on Corps of Engineers August 2015 Draft Final Evaluation of SJRWP FS Remedial Alternatives

Dear Mr. Miller:

As it is our understanding that the U.S. Army Corps of Engineers (Corps) evaluation of the San Jacinto River Waste Pits (SJRWP) Feasibility Study remedial alternatives will be a seminal document in the U.S. EPA's (EPA) decision on the cleanup remedy for the site, the Galveston Bay Foundation (GBF) and Houston Advanced Research Center (HARC) provide the following comments on the Corps' August 2015 draft final report. As the Corps study is dependent upon the data provided in the responsible parties' draft interim feasibility study (FS), our comments certainly speak to the latter. Therefore, you will see reference to the FS in most instances.

In short, we believe that the Corps' study reinforces our stated position, based on the documents provided to date, that simply enhancing the ***temporary*** armored cap is an inappropriate long-term cleanup alternative for this site. We base this statement on the degree of uncertainty that the armored cap will contain the wastes for the time period that will be needed for dioxins to naturally attenuate to concentrations that will be safe for human health and the environment. That uncertainty is clearly documented in the Corps report. Given the location of this site, the level of uncertainty that the armored cap will perform the job of containing the wastes for the necessary amount of time to protect human health and the environment makes it unacceptable.

We offer the following general and specific comments on the Corps' document, by task, that speak to this uncertainty and the study limitations with which the Corps' had to confront, as well as the inadequacy of the responsible parties' FS documents and inherent problems with the responsible parties' recommendation that Alternative 3N (capping alternative) be utilized. The following comments support our prior stated position that (a) complete removal of all the wastes, (b) removal of wastes with dioxin concentrations that exceed the protective concentration level, or (c) stabilizing/solidifying are the only acceptable options for cleanup of this site. For reference, we are attaching our June 18, 2014 comment letter to the National Remedy Review Board.

The following excerpt from that letter speaks to the overlying problems with the responsible parties' findings and the uncertainty of risks associated with Alternative 3N and should be considered when reading our specific comments that follow:
"While the cap that was constructed under the removal action was highly effective in the short term in stopping the continued release of source material into the environment, it is an inappropriate

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long-term solution, because it does not meet the criteria for overall protection, long-term effectiveness, or community acceptance. Based on U.S. EPA's Guidance for In-Situ Subaqueous Capping of Contaminated Sediments, we are concerned about the ability to maintain the long-term physical integrity of the cap in this highly dynamic environment. In particular we are concerned that the effects of the weather, including floods, hurricanes and associated storm surge and hurricane wind-driven waves have not been adequately considered. Additionally, this is a highly used river, and the ability of the RPs to enforce use restrictions necessary to protect the integrity of an in-situ cap is limited."

Executive Summary

We find that the Executive Summary of the Corps study does not match the content contained within it based on the degree of uncertainty in the studies and modeling of the efficacy of the armored cap. We disagree with the implied statements that the risks of removing the waste are on par with the risks of capping the wastes. The Executive Summary does not include a discussion on the effectiveness of a new alternative developed under Tasks 12 and 14 that address full removal of the wastes using excavation in the dry. While we fully agree that wet dredging would be inappropriate, any studies of cleanup alternatives for this site that do not include a rigorous review of an alternative of excavation in the dry are of little use to the agencies or the public in determining the effectiveness of a selected remedy. Our statement speaks more to the inadequacy of the responsible parties' FS than it does to the Corps study of the same. However, GBF and HARC feel that this omission unintentionally misleads those reviewing the Corps document. GBF and HARC recommend that the Corps revise the Executive Summary to include some statement on the new alternative.

As the Corps study was limited by the data presented to them in the FS, we implore the EPA, or a neutral third party, to include a complete scientifically-based review of excavation in the dry alternative using berms and other adequate best management practices. Not doing so renders this site's cleanup process alternatives review incomplete and unacceptable.

Task 2 - Assessment of San Jacinto River bed scour in and around the site.

The Corps study does not assess scour at the site itself. Instead, scour at Banana Bend and south of the Interstate-10 Bridge. As such, the potential for scour at the site itself in inadequately addressed. This leads to uncertainty that an armored cap will be effective. Given the extremely long time period that the cap must be effective for the dioxin to naturally degrade, we find this omission unacceptable.

In the FS, the responsible parties made reference to scour at the base of sheet piling that could be utilized in certain cleanup alternatives; it would seem that the responsible parties could model scour at the site itself in a more complete manner. We highly recommend that the EPA or a neutral third party include an adequate study of scour at the site.

Tasks 5 and 6 – Technical review of the design and construction of the entire existing cap as it is currently configured; assess ability of the existing cap to prevent migration of dioxin.

The study makes statements that diffusive flux of contaminants from the capped area is very small compared to resuspension losses of contaminated particulates prior to capping. The fact that the cap will result in a lower flux prior to capping is of little comfort; the question is whether the flux is acceptable for protection of human health and the environment. We question the definition of a "very small" amount of flux, and given the toxicity of dioxin, if this is acceptable. Any third party

review of the FS should better define the flux of contaminants from the cap, as this is crucial to its evaluation.

The statement that diffusive losses from the sediment are largely unimpeded by the cap is certainly troubling, as is the statement that the large pore structure of the armor cap material would permit a large exchange of water within the cap, preventing the formation of a concentration gradient to slow the diffusion. Further, the statement that the design and construction of the cap in the Northwestern Area is very different than the other two cells and does not provide the same level of confidence in its long-term stability and performance gives us little confidence that Alternative 3N is an acceptable solution.

The Corps statement that the addition of an amendment to the cap to make it effective speaks to the inherent problems with using what was to be a temporary solution the permanent solution. This again speaks to the uncertainty of the effectiveness of the cap as a permanent solution. The risks to human health and the environment form the use of Alternative 3N are too great.

Task 7 – Assess the long-term reliability (500 years) of the cap under the potential conditions within the San Jacinto River, including severe storms, hurricanes, storm surge, subsidence, etc.

These findings in this task, in particular, speak to the level of uncertainty in the effectiveness of Alternative 3N and support the need for (a) complete removal of all the wastes, (b) removal of wastes with dioxin concentrations that exceed the protective concentration level, or (c) stabilizing/solidifying are the only acceptable options for cleanup of this site. Further, we feel that the findings in this task are at odds with the implied statements in the Executive Summary that Alternative 3N provides no more risks than a removal alternative. After all, the key question is whether we trust Alternative 3N to provide for a cleanup that meets the requirements in *U.S. EPA's Guidance for In-Situ Subaqueous Capping of Contaminated Sediments.*

Specifically, the Corps states that in their professional judgment the uncertainty inherent in any quantitative analysis technique used to estimate the long-term (500 years) reliability of the cap is **very high** (emphasis added). The Corps further states that the data needed to estimate the potential scour of the cap due to propwash were not available. Any study of the efficacy of Alternative 3N must include a complete assessment of the effects of propwash given the high volume of barge tow activity immediately adjacent to the vulnerable northwest quadrant of the cap, which contains not geotextile material and with a steep slope that renders it subject to displacement of armoring material.

Worse yet, the study did not include a hurricane simulation. This speaks to one of our main arguments that Alternative 3N is not an acceptable remedy for this site. The potential for hurricane-wind driven waves to impact the cap is of key concern. And the possible scenarios of wind direction, wind speed and water level are many. Any EPA analysis of the remedy for this site MUST include modeling of various hurricane impacts. This site is not located in the Upper Midwest of the U.S.; it is located in a tidal river in an estuary on the Upper Texas Gulf Coast with a history of severe hurricane strikes. The fact that hurricanes were not modeled is unacceptable. This speaks to the completeness, or lack thereof, of the responsible parties' FS.

On these same lines, the Corps study did not construct a worse-case scenario of river flooding at the site. We find this to be unacceptable, as risk analysis should always begin with modeling of worse-

case scenarios. Again, the level of uncertainty of the effectiveness of Alternative 3N is showcased in this task and further supports our argument that one of our recommended remedies be implemented at this particular site.

Task 10 - Identify and document cases, if any, of armoring breaches or confined disposal facility breaches that may have relevance to the San Jacinto site evaluation.
The study indicates that instances of breaches to armored caps typically occurred due to ineffective filtering between the armor and core material, insufficient armor sizing for wave action velocities, and steep side slopes allowing rock to be more easily displaced. Based on the findings in Tasks 5 and 6, we argue that these conditions can be found in the current cap design and can be expected if Alternative 3N is implemented.

We are of the opinion that the findings in Task 10 reinforce our position that an armored cap is not the proper remedy for this site, located in a hurricane-prone area. The examples given are not an 'apples to apples"-type comparison, as the sites are not located on the Upper Texas Gulf Coast in a tidal river adjacent to Galveston Bay.

Once again, this speaks to the level of uncertainty in the risks to the human health and environment of Galveston Bay and the San Jacinto River and its recreational and commercial users and an argument to not place "all of our eggs in the armored cap basket." It may take only one hurricane hit to breach the armored cap. How many times might we expect that in the time period needed for the dioxins to naturally degrade under a cap? In effect, Alternative 3N is long-term storage of toxic wastes. One might argue that the storage of radioactive wastes deep underground in Nevada may be appropriate. However, we believe it is pure common sense that one would not want to store radioactive materials under a cap in the San Jacinto River, much less dioxins.

Task 11 - Assess the potential amount or range of sediment resuspension and residuals under the various remedial alternatives including capping, solidification, and removal.
According to the cleanup documents that we have reviewed, the concentrations of dioxin outside of the footprint of the original pits are at or near background levels. As such, any remedies employed do not have to disturb areas with dangerous concentrations. The assumptions that work will be taking place in the wet instead of in the dry exaggerate the potential for resuspension. The responsible parties could install these remedies outside of the footprint. Thus, the cap would not have to be removed in the installation of sheet piles or other methodology to dewater the site prior to excavation or stabilization/solidification. Therefore, we believe this section's findings on the potential resuspension of dioxin-laden sediment to be irrelevant. Of much more use would be an evaluation of the potential amount or range of sediment resuspension and residuals under the various remedial alternatives including capping, solidification, and removal **using best management practices.**

Task 12 - Identify and evaluate techniques, approaches, Best Management Practices (BMPs), temporary barriers, operational controls, and/or engineering controls to minimize the amount of sediment resuspension and sediment residuals concentrations during and after dredging/removal.
The findings in this task simply speak to the inadequate nature of the responsible parties' FS and the list of alternative remedies for the site. The Corps study is limited to what the responsible parties' proposed, which renders the study incomplete without a complete excavation or other excavation

and stabilization/solidification options using best management practices, such as completing work in the dry and placing sheet piling outside of the contaminated areas.

As far as assessment of the alternatives that the responsible parties did offer in the FS, the Corps findings include the statement that the FS suggests that sheet pile would need to be driven through the existing TCRA Cap. As noted in the section above, we simply ask "why?" Sheetpile, berm or other method to isolate the pits from the river and dewater it do not have to contact or impact the cap nor do they have to disturb sediment with high concentrations of dioxin.

We appreciate that the EPA directed the Corps to develop and assess a new full removal alternative. As noted above, we feel that the responsible parties should have included such an alternative in their FS and not only alternatives that, in effect, involve dredging of materials in a manner that would specifically enhance instead of reduce resuspension of contaminants, thus making those options irrelevant for comparison.

We note that the Corps states that sheet pile would likely be more effective than the responsible parties' silt curtain methods for controlling resuspension and that virtually all losses by resuspension and erosion of residuals could be eliminated by excavation in the dry. The Corps further notes the use of berm construction to isolate different sections of the waste pits. We appreciate that the Corps addressed the use of berm and/or sheetpile for some sections of the pits, but ask why berms, in particular, and as appropriate, sheetpiles cannot be used to isolate the whole of the pits from the San Jacinto River such that excavation in the dry can be implemented as the remedy for the site.

It is our opinion that the limiting factor in applying a dewatering/excavation in the dry alternative is the cost to the responsible parties rather than their technical ability to carry out such a remedy.

Task 18 - Assess the potential for release of material from the waste pits caused by a storm occurring during a removal/dredging operation.
While we agree that there is risk of a storm event during removal actions, based on the inherent uncertainty in the efficacy of the cap over the extended duration that a cap would need to perform (in effect, permanent storage) that the risk to human health and the environment from complete removal is less than that of Alternative 3N. We believe that the Corps assessment in Task 18 is incomplete without an assessment of excavation in the dry using berms. In addition, it would be possible to perform the work in stages, focusing work on the months of the year that are not prone to hurricanes. In addition, best management practices for construction operations should include tracking the weather forecasts and securing the site appropriately before sever weather strikes to minimize potential releases.

Task 20 - Assess the appropriateness of the preliminary sediment remediation action level of 220 *ng/kg* in consideration of the appropriate exposure scenario
As pointed out in the Corps report, the FS uses human health Sediment Protective Concentration Levels (PCLs) for Dioxin/Furans based on both exposure to sediment by a hypothetical recreational fisher and a hypothetical recreational visitor, and exposure to soils by a hypothetical construction worker and a hypothetical commercial worker. As subsistence fishermen can be seen fishing and crabbing the waters immediately adjacent to the waste pits on a daily basis, we argue that the FS is flawed in assessing the risks to those that would consume seafood harvested from the area of the

pits. Risks to subsistence fishermen must be evaluated for the FS to have any validity. We implore the EPA or a neutral third party to assess such risks.

Comment Summary

While we appreciate that there is a risk of release of waste material during any sort of construction at the site, we believe that the releases will be minimal if appropriate control measures, e.g. the use of berms and/or sheetpiles, appropriate structural placement, timing, and other risk reduction control measures are employed. Complete removal of all the wastes, removal of wastes with dioxin concentrations that exceed the protective concentration level, or stabilizing/solidifying the waste would help reduce the long term risk of release of dioxin in the event of a cap failure. Of these options, complete removal of the wastes would provide the greatest long-term reduction of risk to human and environmental health.

Again, it is our opinion that the limiting factor in applying a dewatering/excavation in the dry alternative is the cost to the responsible parties rather than their technical ability to carry out such a remedy. Therefore, we must ask what will be the cost to the environmental health of Galveston Bay, the economic health of its commercial and recreational fisheries, and most importantly, the human health cost to those who use the bay for recreation and as a seafood source if Alternative 3N fails to serve what is, in effect, permanent storage of toxic wastes in an extremely vulnerable location? We must ask, does it meet the requirements of EPA's own guidance for such a site?

The Galveston Bay Foundation, HARC, and the community appreciate this opportunity to provide the EPA comments on the Corps draft study. Thank you for your efforts to protect the community. If you have any questions or comments, please do not hesitate to contact Mr. Scott Jones at (281) 332-3381 x209 and sjones@galvbay.org or Ms. Jennifer Ronk at (414) 331-5570 jronk@HARCresearch.org.

Sincerely,

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cc: Donn Walters, EPA Region 6 Superfund Community Involvement Team
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