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January 2, 2024

Mr. Luke Lampo
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
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Subject: Response to DNR Comments on Draft Desktop Supplemental Remedial Investigation (RI)
Badger Army Ammunition Plant, Gruber's Grove Bay, Baraboo, WI
DNR BRRTS Activity #02-57-001002

Dear Mr. Lampo:

Please find the attached responses from the Army to the Wisconsin Department of Natural Resources (DNR) correspondence dated November 14, 2023. This submittal responds to DNR comments that will be incorporated in the Final Desktop Supplemental RI Report and future deliverables for the project.

If you have any questions, please contact Tat Ebihara at 847.902.1519.

Yours sincerely,

Tat Ebihara, PhD
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Billy Rhymes
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Attachment:
Attachment A – Army Response to WDNR Comments dated November 14, 2023.

cc: Judy Fassbender, DNR
Issac Ross, DNR
Xiaochun Zhang, DNR
Quang Nguyen, Army
Jessica Hoppman, USACE
Ryan Tefft, USACE
Brian Mastin, AECOM

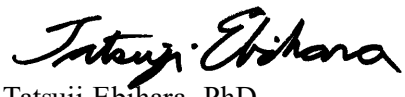
ARMY RESPONSE TO WDNR COMMENTS DATED NOVEMBER 14, 2023
GRUBER'S GROVE BAY, BADGER ARMY AMMUNITION PLANT, BARABOO, WISCONSIN

Document Date: 22-Dec-2023

SUBJECT: Response to DNR Comments on Draft Desktop Supplemental Remedial Investigation Badger Army Ammunition Plant, Gruber's Grove Bay, Baraboo, WI DNR BRRTS Activity #02-57-001002

AECOM and the U.S. Army is providing the following comment responses to the Wisconsin Department of Natural Resources (DNR) from their November 14, 2023 correspondence and attachment. The responses to comments describe the scope of the revised and updated elements of the Final Desktop Supplemental Remedial Investigation Report and subsequent report deliverables associated with this project.

Approved by:



Tatsuji Ebihara, PhD
AECOM
Project Manager

Ryan Tefft
U.S. Army Corps of Engineers – Omaha District
Project Manager

The Wisconsin Department of Natural Resources (DNR) has received and reviewed the document entitled "Draft Desktop Supplemental Remedial Investigation Badger Army Ammunition Plant Gruber's Grove Bay, WI" (Report), dated July 2023, prepared for the United States Army Corps of Engineers (USACE) and U.S. Army Environmental Command (Army) by AECOM Technical Services, Inc. (AECOM).

DNR appreciates the helpful summary of post-2000 documentation regarding site assessment and remedial action. The data files further assisted our understanding of the assessment. Considering the project purpose and ultimate remedial objectives for the site, in general, DNR offers the following recommendations:

- The previously established most probable background contamination (MPBC) of 0.36 mg/kg total mercury (THg) in sediment was approved in 2000 by the Badger Army Ammunition Plant (BAAP) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Resource Conservation and Recovery Act (RCRA), and AR200-l as captured in the 2000 Decision Document (DD). Calculation of a new background threshold value (BTV) for evaluation of the extent of contamination was not approved by DNR. The dataset used in the BTV calculation included data collected in 2019 from Lake Wisconsin which represents a riverine system, not representative of a bay environment. Additionally, the sampling and analysis methods were also different from those used for site characterization of Gruber's Grove Bay (GGB). DNR requests to continue using the approved MPBC for evaluation of sediment contamination in GGB.

  COMMENT 1 RESPONSE: ***The Army understands the 2000 Decision Document Basis for the most probable background concentration (MPBC) of 0.36 mg/kg. While the USGS data from upstream sediment sampling locations document mercury concentrations above the MPBC in the Wisconsin River upstream of GGB, the Final Desktop Supplemental RI report will proceed on the 2000 Decision Document Basis.***

- Please define data quality objectives for collecting additional samples. The data quality objectives should be clearly identified and may include 1) providing better delineation of the horizontal and vertical extent of contamination; 2) further assessing potential existing sources, specifically mercury present in Settling Pond 4 and the ditch area; and 3) evaluating migration of mercury into the Wisconsin River.

  COMMENT 2 RESPONSE: ***Data quality objectives will be addressed in the updated Quality Assurance Project Plan (QAPP) for additional data gap investigation (DGI) sampling and sediment characterization proposed for this site.***

- The risk assessment results demonstrated that the site poses risks to ecological and human health. Although substantial uncertainties exist, the uncertainties are understood to be the result of variations in physical, chemical, and biological data, assumptions, and endpoints evaluated. Attempts to reduce those uncertainties will require extensive efforts to collect and reevaluate additional data. Other lines of evidence are available that eliminate the need for additional data collection for risk assessment. Additional assessment will not significantly change remedial action requirement to improve the sediment and water quality. Such conclusion has already been well explained in the 2000 DD. DNR recommends that no additional studies, i.e., assessment of biological community, be conducted for risk assessment at this time.

  COMMENT 3 RESPONSE: ***In light of the inherent uncertainties associated with GGB and the need to keep progressing the project toward FS activities, the Army agrees with DNR that no additional biological community and risk assessment field sampling studies will be conducted as part of the Final Desktop Supplemental RI report. The recommended scope for additional benthic characterization will be removed from Section 6.9 the final RI report.***

- DNR believes adequate characterization has been completed within GGB and recommends the team move forward with a feasibility study for remediation of sediment in GGB.

  COMMENT 4 RESPONSE: ***The Army will finalize the Deskstop Supplemental RI Report without additional sediment characterization. A DGI report will provide supplemental sediment physical property characterization following the Final Desktop Supplemental RI report.***

- Evaluate the potential for on-going migration of contaminants from possible source areas including Settling Pond 4 and the adjacent ditch area. Consider additional sampling from Settling Pond 4 and the ditch area as part of the evaluation. Evaluate the potential for contaminants to migrate further into the Wisconsin River downstream of GGB.

  COMMENT 5 RESPONSE: ***The Army does not plan to perform additional sampling related to Settling Pond 4 as this scope is not approved in the USACE budgeting plans for upcoming fiscal year. However, the DGI report deliverable will include additional existing documentation supporting the absence of a pathway for contaminant migration into GGB via buried culverts and surface runoff associated with Settling Pond 4.***

Additional details regarding DNR's recommendations are provided in the enclosed Attachment.

DNR Attachment from November 14, 2023 Correspondence

The purpose of this attachment is to provide information to explain the analyses and evaluation that support the recommendations as summarized above as well as some specific questions and comments on the report. This attachment is organized in four components: 1) new background threshold value (BTV); 2) conceptual site model; 3) potential existing sources; 4) fate and transport of contaminated sediment and gelatinous materials; 5) human health and ecological and risk assessment; 6) comments on recommendations in the report.

1. New background threshold value (BTV)

Historically, Wiegands Bay has been used as the background site to establish the most probable background contamination (MBPC) of 0.36 mg/kg of total mercury (THg) for assessment and remediation at Gruber's Grove Bay (GGB). The Report presented a new value of 0.49 mg/kg in sediment as the BTV for evaluation of the extent of contamination in GGB. The BTV was calculated based on mercury concentrations in the top 0.16 ft of sediment samples collected in 2019 by the United States Geological Survey (USGS) from two reference sites, Wiegands Bay and Lake Wisconsin which is located upstream of Wiegands Bay. Different sampling and analytical methods applied by the USGS was the factor that precluded the use of the USGS data for this remedial investigation within GGB as stated in the Report. In addition, the effect of using the BTV of 0.49 mg/kg instead of the MPBC of 0.36 mg/kg of THg on delineation of spatial distribution of contaminated sediment at the site is insignificant. The difference using the BTV on evaluation of spatial extent can be illustrated by adding another class of 0.36-0.49 mg/kg in Figures 2-3 and 2-4. Please modify the figures with classifications including the class of 0.36-0.49mg/kg.

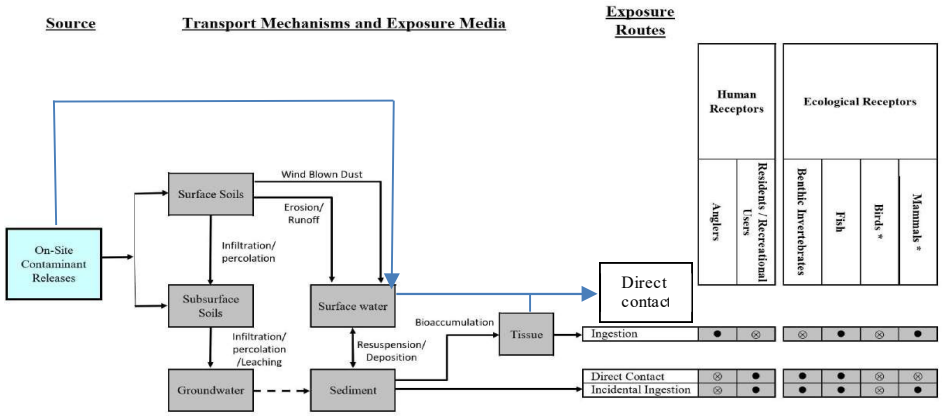
COMMENT 6 RESPONSE: ***The Army will modify Figures 2-3 and 2-4 for sediments in the 0.36 to 0.49 mg/kg range as requested by DNR. It should be noted that since upstream Lake Wisconsin sediments (USGS, 2019) are greater than the 0.36 mg/kg MPBV, the use of the 0.49 mg/kg BTV may become important for delineating the extent of total mercury at the mouth of GGB for remediation alternatives.***

2. Conceptual site model (CSM)

Clarification is required to define whether the conceptual site model as illustrated in Figure 3-1 (adopted below) represents the site history or the current condition. Historically, the on-site contaminant release directly discharged to surface water in GGB. The CSM needs to include surface water as a media for direct exposure and through bioconcentration and bioaccumulation even if the risk to human health is insignificant as assumed in the Report. Connectors should be added to Figure 3-1 as indicated to illustrate the surface water exposure pathway under historical condition.

COMMENT 7 RESPONSE*: Surface water will be added to Figure 3-1 as a potential pathway as requested by DNR.*

If the CSM reflects the current condition, then it must be modified to include potential discharges from Settling Pond 4 and the ditch area through buried culverts and surface runoff to surface water and sediment in the bay. Mercury (Hg) concentrations up to 8.2 mg/kg were detected in soil samples collected from Settling Pond 4 by the USGS (2019). According to the environmental impact statement and report (Owen Ayres & Associates 1973), potentially there are fifteen 24" diameter culverts buried under the old State Highway 78. During heavy precipitation and snowmelt, the ponded water may discharge to GGB via the culverts.



COMMENT 8 RESPONSE: ***See response to Comment 5 regarding additional documentation that will be provided about water discharges into GGB in the DGI Report***.

The Report needs to develop and refine a CSM that considers sediment stability as requested in the Performance Work Statement (USACE, 2022). Mercury in dissolved and particulate phases may continue to migrate out of GGB to the Wisconsin River especially because higher concentration of mercury is associated with gelatinous materials which is more mobile than other sediment material.

COMMENT 9 RESPONSE: ***The existing datasets, as summarized in the Desktop Supplemental RI did not allow for sediment stability evaluation. The Army agrees that it is acceptable to move on to the FS evaluation with a DGI pending. As discussed in the draft RI report, an assessment of sediment transport and changing concentrations over time is not possible using data collected to date. Sampling locations from 2009 do not align with sample locations from 2016 and 2018, thus changes over time could not be determined. Additionally, samples collected in 2016 were collected from the surface only, whereas samples collected in 2018 were primarily subsurface. The 2016 and 2018 samples were assessed together to get an overall picture of elevated total mercury (THg) concentrations in GGB.***

3. Fate and transport of contaminated sediment and gelatinous materials

The presence of gelatinous material in GGB has been well documented through site investigation and previous remediation activities. These materials are indictive of discharge from the BAAP wastewater treatment processes and are associated with high mercury concentrations as well as other contaminants of concern. Low shear strength of 0 kg/cm^2 was reported in 5 out of 6 top surface samples and a range of 0.05 to 0.15 0 kg/cm^2 at 1 ft below sediment surface (SpecPro, 2009). With such low shear strength, small disturbances, whether naturally induced or as a result of human activity, the materials may easily mix vertically and resuspend from sediment to water column that result in redistribution within the bay and transport out of the bay. Therefore, the dynamic sediment transport processes can cause temporal changes of spatial distribution of the gelatinous materials. Results from various assessments have shown that the materials tend to “focus” in deeper water areas in the bay. The increase of surface area weighted concentration (SWAC) from 0.72 mg/kg in 2009

(SpecPro, 2009) to 1.11 mg/kg in 2011 (SPS, 2016) may be attributed to sediment redistribution within GGB. This also leads to concerns of mercury loading from GGB to the Wisconsin River downstream of GGB. In addition, with historical discharge averaging in approximately 18 million gallons per day (MGD) based on 1972 data (Owen Ayres & Association, 1973), gelatinous materials associated with contaminants of concern in suspended form might have left the bay and deposited in the Wisconsin River.

COMMENT 10 RESPONSE: ***As noted in the response to Comment 9, existing datasets do not allow for a sediment stability evaluation. As noted in the Desktop Supplemental RI Report, sediment transport into or out of GGB could not be quantified since sampling locations have not been repeated over time. Furthermore, use of the 2009 sediment data is not recommended to evaluate change over time since different sampling procedures were used in the 2009 sampling event, confounding any conclusion that could be drawn by comparing results, including SWAC values, to other years. Samples collected in 2009 involved some compositing of the soft "gelatinous" materials with the underlying thicker fine-grained sediment, resulting in an inconsistency of the type of material sent for analysis. Samples were then homogenized and sent for analysis using USEPA Method 7471A. As noted in Section 2.1, Data Useability, six split samples collected by WDNR at the time of the 2009 event included only the gelatinous portion of the sediment; differences in analytical results between SPS and WDNR were noted in Table 3 of the 2009 report (SPS, 2009). This resulted in the area of mercury background exceedances for the 2009 dataset being far less than the area of background exceedances for the 2016/2018 dataset and likely contributed to a much lower SWAC value for 2009.***

4. Human health and ecological risk assessment

Mercury contamination in sediment of GGB after the second remedial action in 2006 has been assessed multiple times. It is anticipated that remediation has improved sediment quality, unfortunately sediment samples collected from 2009 through 2018 revealed mercury concentrations up to 12.4 mg/kg which is not significantly different from 16.7 mg/kg in 2005 samples (AECOM, 2023). Based on a 2016 site assessment, over 50% of the surface sediment in the bay is potentially covered with material containing mercury concentrations greater than 1 mg/kg.

In 2000, BAAP approved remedial objectives and selected remedial option as documented in the 2000 DD. Several key specific decisions are worth reiterating: 1) *an expanded problem formulation plan (EPFP) was developed in lieu of a full ecological risk assessment (ERA)*; 2) *the EPFP concluded that it is unlikely that a site- specific ERA would support a cleanup level significantly different from the WDNR's proposed most probable background contamination (MPBC) level of 0.36 mg/kg of total mercury*; 3) *site risks are associated predominantly with ecological receptors in direct contact with the sediments and the food chain pathway.*

Although ecological communities have not been evaluated since 2006, the presence of Hg with relatively higher percent of methylmercury in GGB compared to the reference site, exceedance of surface water criteria for wildlife, and the mere presence of gelatinous materials indicate that the sediment quality has not returned to support a healthy biological condition at the bay. The decision made in the 2000 DD to use the conclusion from the EPFP for managing the site is still valid. It is recommended that no additional data collection and assessment effort be carried out to further evaluate risks prior to remedial action, however, some specific comments and recommended changes in the Report are included below.

COMMENT 11 RESPONSE: ***The DNR comment is acknowledged and specific comments on the risk assessments are provided in the responses to Comments 12 to 20. While it is understood that the approved MPBC is the preferred clean up level by WDNR, the USGS evaluation indicated that mercury concentrations in upstream sediments in the Wisconsin River were present above the MPBC and that particulate matter from the Wisconsin River contributed to mercury within GGB sediments. Therefore, future data collection or habitat***

characterization efforts may be warranted in the future to support the scope of the remedial action alternatives analysis.

Human Health Risk Assessment

- Surface water exposure

  The surface water exposure pathway should be included in the CSM. The USGS reported of THg concentration in surface water in the bay with a maximum concentration of 1.4 ng/l, slightly lower than the human health criterion of 1.5 ng/l (NR105). However, the samples were collected under conditions without turbulence. Mercury concentrations in surface water is expected to increase under turbulent conditions and may exceed the criterion after sediment is resuspended. The disturbed gelatinous materials will take a long time to settle; therefore, potential exposure through surface water may be present.

  COMMENT 12 RESPONSE: ***USACE disagrees with WDNR's comment that the USGS suspended particulate matter (SPM) data collected for surface water was not representative of long-term, post-dredging quiescent conditions (e.g. what would be accomplishable after remediation) which would be representative of conditions within GGB. During the Nov. 17, 2023 teleconference, WDNR expressed that "this comment was meant to be line of evidence that sediment is the target for remediation."***

  Only four surface water samples were collected from within the Bay in 2019 and all of the USGS samples were collected as 'suspended particulate matter' samples (e.g., sample volumes of 18 to 36 liters filtered and material on the filter analyzed) rather than more typical 1 L grab surface water samples. Maximum THg concentrations in GGB were higher than in Wiegands Bay (n=4), but lower than in all of the upstream reference locations (n=3). USGS indicated that THg in GGB was significantly higher than Wiegands Bay, but not higher than the other upstream reference locations. USGS also indicated that water column particulate matter from the Wisconsin River contributes to mercury within GGB.

- Concentration Terms

  Provide clarification on why the USGS 2019 sediment data were included in the upper confidence limit (UCL) calculations but excluded from the assessment of the extent of contamination.

  The risk assessment is not adequately conservative. The 2018 assessment (SPS, 2019) reported a maximum concentration of 12.4 mg/kg in the gelatinous sediment layer in a depth interval of 0.5-1.5 ft. The sediment concentration term for the risk assessment did not include this maximum concentration. A conservative assessment should have combined results from 2016 with the results in subsurface sediment but characterized as gelatinous materials. This non-conservative factor has been identified but no further risk assessment evaluation is requested.

  COMMENT 13 RESPONSE: ***The USGS data from 2019 was not included in the UCL calculations used in the HHRA and the ERA (see Appendix D for data used for the UCLs). The text in Section 4.1.3.1 that refers to the 2019 dataset will be corrected. The USGS data were not included in the risk assessments because the analytical methods (modified EPA Method 1630) and sampling depths (0-5 cm increments to varying depths at the same location) were different from the data collected from within the Bay as part of the 2016 and 2018 sediment sampling activities.***

  It should also be noted that the 12.4 mg/kg maximum detected concentration referenced in the

second part of the WDNR comment was included in the UCL calculation for the subsurface sediment (>0.5 ft; see Table 4-1 and Appendix D).

- Fish tissue burden of mercury

  Historically, methylmercury in sediment was detected at the site in the highest level across the state water bodies (DD, 2000). Bioaccumulation and bioconcentration of methylmercury from sediment and surface water is a concern. The assessment conducted is based on fish tissue mercury data collected in a single year. The uncertainties could be high with the limited data. In general, multiple years of sampling data may be needed for assessment so that the results are statistically significant, however, DNR does not recommend collecting additional fish samples for remediation purpose because other lines of evidence exist for decision making at the site.

  COMMENT 14 RESPONSE: ***It is recognized that the fish tissue dataset is limited by the availability of data from a single year. In recognition of this limitation, the maximum fish tissue concentration was considered in the risk assessment.***

  As recommended by WDNR, no additional biological sampling is warranted at this time, so any uncertainties related to the fish tissue dataset will not be addressed at this time.

- Toxicity Assessment

  It is acknowledged that although the reference dose (RfD) for assessment of direct dermal contact to inorganic mercury in sediment may be based on the form of mercury chloride as a default, other forms of mercury can exist in sediment at the site.

  Although it might be of low significance, the surface water exposure pathway was not included in estimating the cumulative hazard index (HI).

  COMMENT 15 RESPONSE: ***As indicated in Section 4.1.6.2, surface water exposures were not quantitatively evaluated in the HHRA as exposures have been shown to be negligible and not pose unacceptable risks. Surface water exposure pathways will be added to the CSM figure; however, human exposures to surface water are expected to be insignificant relative to other exposure pathways. This will be further addressed in the Final Desktop Supplemental RI report narrative.***

  The EPFP indicated that ingestion of surface water would be at an intake level lower than the intake level of sediment and that ingestion of surface water may be excluded for mercury. Sampling in 2005 indicated that average surface water concentrations of metals were below DNR ambient water quality criteria and that GGB sediment may not be impacting water concentrations. Sampling within the Bay has primarily focused on sediment, thus, a current surface water dataset is not available.

<u>Ecological Risk Assessment</u>

- Two of the four surface water samples (USGS, 2019) exceeded wildlife criterion of 1.3 ng/l for mercury (NR105) while these samples were collected under quiescent conditions. The criterion is for protection of bald eagle, herring gull, mink and otter and other mammalian species. In addition, there is a clear decreasing trend of mercury concentration in surface water from 1.44 to 1.03 ng/l from the head to the mouth of GGB in four samples collected by the USGS in 2019. That trend is an indication that the influence of the Wisconsin River flow on GGB is perhaps limited to the region close to the

mouth of the bay.

COMMENT 16 RESPONSE: ***The water quality criteria is very conservative because it assumes that the higher level consumers and predators are obtaining all of their diet from GGB. In addition, the decreasing trend identified by WDNR based on 3 USGS samples is not considered statistically significant given the small sample size.***

As indicated by USGS, water column particulate matter from the Wisconsin River contributes to mercury within GGB. Within the Bay itself, USGS in 2019 estimated that more than 50% of sediment mercury was sourced from the BAAP, but in surface sediment at the GGB margin, non-BAAP riverine sources contributed up to 75% of the sediment mercury. It is noted that total mercury concentrations in waters collected by USGS from upstream reference locations were also above the 1.3 ng/L criterions indicating that upstream, non-BAAP sources may also affect water quality and could represent continuing sources to the GGB after remedial actions are completed.

Toxicity reference values (TRVs) for fish tissue obtained from Dillon et al. (Dillon et al., 2010) were based on endpoints related to mortality or lethality-equivalent endpoints without consideration of other important biological endpoints, for instance the effects of mercury on inhibition of growth and to behavioral changes of organisms. Therefore, the conclusion should be modified to clarify the limited endpoints using results from Dillon et al.

COMMENT 17 RESPONSE: ***The conclusions will be updated to indicate that the fish-tissue TRVs are based on endpoints including fish mortality, failure to spawn, failure to hatch, and lethal developmental abnormalities and that other sublethal endpoints may be more sensitive.***

- **Section 4.2.6 Ecological Risk Characterization**: Note that not all benthic organisms burrow through sediment.

  COMMENT 18 RESPONSE: ***A statement will be added to indicate that benthic invertebrates may also live in the sediment surface.***

- **4.2.6.3 Risk Description:** It is appropriate to use 'co-occurrence' sediment quality guidelines (SQGs) of threshold effect concentrations (TEC) and probable effect concentrations (PEC) to evaluate sediment quality at GGB. Sediment or gelatinous materials present at the site is a result of discharge from wastewater treatment process, potentially including flocculated sludge. According to an earlier assessment in 2000 (cross referenced by AECOM, 2023), in addition to mercury, copper and lead coexist in sediment with concentrations up to 277 mg/kg and 1,200 mg/kg, respectively. In addition, the gelatinous materials may contain chemicals that have not been analyzed but could cause adverse impacts on the biological community, further transformed, and potentially magnified to higher trophic organisms. Selection of mercury as the primary contaminant of concern or an indicator for assessment and remediation is because of the assumption that when the site is remediated based on mercury contamination, the risk posed by other co-existing chemicals will also be reduced. Therefore, it is recommended that the 'co-occurrence' sediment quality guidelines of TEC and PEC (SQGs) for mercury be used for the toxicity prediction.

  COMMENT 19 RESPONSE: ***The WDNR TEC & PEC have been used to quantitatively evaluate sediment quality at GGB. However, it is relevant to point out that other benchmarks are available from mercury-spiked studies and mercury contaminated sites (which may also include lower levels***

of other contaminants) and that toxicity testing conducted in 2005 (which would have included other co-located contaminants) identified less toxicity than would be suggested by the mercury PEC exceedances.

Text will be added that the use of the mercury TEC and PEC is assumed to be appropriate for the GGB evaluation due to the potential for other co-located contaminants to also be present within the Bay.

- The statement of "*[t]his potential lack of a benthic invertebrate community would reduce the potential for mercury to move up into the food web since there would be no connection between mercury in sediment and invertebrates that would serve as a prey base for fish*" is not supported. First, absence or reduced population of benthic organisms in a sediment site is an indicator of impairment of sediment and water quality. Second, benthic invertebrates are not the sole source of food for fish, particularly those that feed on plants.

  COMMENT 20 RESPONSE: ***The text will be modified to indicate that a lack of benthic invertebrate community due to the presence of the gelatinous sediment and unstable substrate represents an impairment based on physical conditions. The text will also be modified to indicate that these substrate limitations may not limit the growth of plants or reduce foraging opportunities for herbivorous fish. However, if the benthic community is not currently present due to substrate limitations, then movement of mercury from sediment to benthic invertebrates to fish and high trophic level receptors is not a significant migration pathway.***

5. Comments on recommendations in the Report

Additional sampling: Data related to the thickness of soft sediment or gelatinous materials available from 2009 through 2018 should be reviewed and integrated into the assessment of the horizontal and vertical extent of contamination. Additional sampling should be recommended, if needed, based on the results of the review. Distribution of sediment (gelatinous materials) is significantly affected by the sediment hydrodynamic processes in the bay. Areas with high uncertainties of mercury concentrations as illustrated in Figures 2-5 and 2-6 may be correlated with lack of deposition of contaminated materials. Therefore, additional sampling efforts may not provide useful data for delineation of horizontal and vertical extent of contamination.

As a part of feasibility study, sediment probing might be helpful to define volume of contaminated sediment at the site.

COMMENT 21 RESPONSE: ***See response to Comment 10 above regarding the 2009 dataset. The Army agrees that additional horizontal and vertical delineation is need to address data uncertainties. Additional delineation will be included in the DGI and FS scope of work for priority locations toward definition of the contaminated sediment volume.***