July 25, 2019

Kelly Neff
Chief, Mitigation and Technical Assistance Section
Wetlands and Waterways Program
Maryland Department of the Environment
1800 Washington Blvd., Suite 430
Baltimore, MD 21230

Matthew Hynson
Regulatory & Compliance Engineer
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, MD 21230

RE: Comments to Draft Mitigation Banking Instrument for the Eccleston Mitigation Bank
JMT Job No. 17-10977-001
Client Ref No. Eccleston Mitigation Bank

Dear Ms. Neff and Mr. Hynson:

Johnson, Mirmiran & Thompson (JMT) is pleased to submit comments to the Draft Mitigation Banking Instrument (MBI) for the Eccleston Mitigation Bank. At this time, this site may or may not become a Permittee Responsible Project.

If you have any questions or need further information, please do not hesitate to contact me at 410-316-2484 or cdenison@jmt.com.

Very truly yours,

Chandler Denison
Director
Environment Markets Group
JOHNSON, MIRMIRAN & THOMPSON, INC.

[Enclosures]

Kelly Neff Comment Responses

1. Please remove the Maryland Board of Public Works and the Maryland Critical Area from the list of Interagency Review Team (IRT) members, as they will not be on the IRT for this project.
   - This comment does not apply to a Permittee Responsible Mitigation (PRM) project.

2. Section 6.
   a. What about other government Permittees (e.g., for stormwater management projects, etc.)?
      - TMDL credit is no longer being proposed. This comment does not apply to a PRM project.
   b. This section may need more language clarifying that the Permittee would still need to get approval to use these credits later, as part of the permit decision, and that there is no guarantee that the permitting agencies will allow the use of the bank credits at that time.
      - This comment does not apply to a PRM project.

3. Section 7. Please revise the last sentence of the first paragraph. The USACE and MDE do have discretion to deny the use of the credits. MDE will not sign an MBI with the current language. While we will generally allow the use of the bank, we may not in some cases where the impacts are to a unique resource, not replaced at the bank. Please refer to language used in previously approved MBIs.
   - This comment does not apply to a PRM project.

4. Section 9. While the last sentence is partly true, impacts within the secondary service area may be required to demonstrate that the impacts will be replaced at the bank. Please revise this language.
   - This comment does not apply to a PRM project.

5. Section 14.
   a. A draft easement should be included in the MBI for IRT review.
      - This comment does not apply to a PRM project. However, per the 2008 Compensatory Mitigation Rule, an easement will be provided with North American Land Trust holding the easement.
   b. Grazing is not a compatible land use.
      - Comment noted; no grazing will be permitted within the boundaries of the mitigation site.
   c. Please be sure the easement includes all elements included in the standard IRT template.
      - The easement will include all elements required by the 2008 Compensatory Mitigation Rule.

6. Section 19 Financial Assurances
   a. Financial assurance must include the cost of land.
      - MDOT MDTA will provide the financial assurances for all PRM projects included in the Compensatory Mitigation Plan.
      - Bank Operations Financial Assurance
        i. Option A
           1. Setting aside 4% of proceeds from Credit sales for Bank Operation Financial Assurance will not be adequate to cover the amount required early in the monitoring period.
           2. If you release 14% of the Bank Operation Financial Assurance balance each of the 7 years of monitoring, this would result in 98% of the fund being depleted. Enough money

must remain in the fund to cover the potential interim monitoring period.

ii. Option B. Please specify how much will be released at each monitoring report year.

iii. If you decide to propose a more aggressive credit release schedule, following the February 22, 2019 USACE Regional Guidance Letter, more financial assurances will need to be provided and held longer, to reduce the risk that resources will be lost.

- This comment does not apply to a PRM project.

7. Section 21. Long-Term Management
   a. Rather than just granting the long-term steward access to the long-term management fund, this fund should be transferred to the steward.
      - Long-term management of the site will be in compliance with the 2008 Compensatory Mitigation Rule.
   b. If the Sponsor makes a gift to an existing endowment fund, it needs to be clear that this money is separate from other funding and will be used only for the long-term management of the Bank.
      - Long-term management of the site will be in compliance with the 2008 Compensatory Mitigation Rule.

8. Section 26 Catastrophic Events.
   a. Please include language similar to other approved MBIs in Maryland. For example, you added a sentence in the first paragraph defining catastrophic events as being "significantly harmful events that are foreseeable yet unlikely to occur." This completely changes the definition used in other banks.
   b. Many of these items are not standard language used in other approved MBIs within Maryland. The IRT will need to discuss their acceptability. Some of the items listed may not qualify as Catastrophic Events.
   c. Please clarify that damage from deer, beaver, etc. are not catastrophic events.
      - This comment does not apply to a PRM project; however, adaptive management will be included in compliance with the 2008 Compensatory Mitigation Rule.

9. Section 27. Force Majeure
   a. Many of these items are not standard language used in other approved MBIs within Maryland. The IRT will need to discuss their acceptability. Some of the items listed may not qualify as Force Majeure.
   b. Please include language discussing how it is the Sponsor's responsibility to demonstrate the damage and that it could not have anticipated or controlled and that the proposed corrective actions and schedule are appropriate to repair the damage.
   c. Please clarify that damage from deer, beaver, etc. are not Force Majeure.
      - This comment does not apply to a PRM project; however, adaptive management will be included in compliance with the 2008 Compensatory Mitigation Rule.

10. Section 28. Eminent Domain. Please revise the language to mirror what was approved for other MBIs in Maryland.
    - This comment does not apply to a PRM project.

11. Exhibit B Property Assessment. There are several items in this checklist that have not yet been checked off. I assume you will submit these with the next version?
    - This comment does not apply to a PRM project.

12. Exhibit C Site Selection Criteria. This was not developed or approved by the MDE Mitigation Section. Where did you get this guidance document?
    - This comment does not apply to a PRM project. The guidance document is from USACE Norfolk District and use of it was directed by the IRT while the site was still being considered for use as a mitigation bank. The site was identified based on agricultural land use and sensitivity of the stream as being a site that is in need of restoration.

13. Exhibit D Geographic Service Area.
    a. Please add language to note that the MDE reviewer may allow the use of the Bank for minor impacts outside of the service area on a case-by-case basis as part of the permit decision.
    b. The Secondary Service Area should not include the Coastal Plain portions. Please revise the language accordingly and adjust the map.
        - This comment does not apply to a PRM project.

14. Exhibit E Mitigation Work Plan
    a. You are proposing to remove a large amount of forest. Even under normal circumstances, the MDE Mitigation Section discourages so much tree removal. Since this area currently provides decent trout habitat, it is even more important to reduce the amount of forest disturbance. Please consider ways to reduce forest disturbance.
        - The Final Plans will have a detailed listing of which trees remain and which are to be removed. Maintaining coverage of the canopy but also removing diseased, dying, or vine covered trees is a paramount issue on the site. This project maintains a high degree of maple, oak, and other canopy and critical trees; however, much of the green ash canopy is proposed for removal as the entire area is under heavy influence of Emerald Ash Borer. Significant reforestation is proposed with an extended riparian buffer.
    b. TMDL crediting versus mitigation crediting is a little confusing. Please try to clarify.
        - This comment does not apply to a PRM project.
    c. Some tributaries (and wetlands) are perched and will remain perched. Should they get full crediting? It should be clarified which of these are currently perched and which will remain perched.
        - Many of the impacts are to perched first and zero order tributaries and these streams are of similar character to the status, function and value of what is to be restored. Tributaries at the periphery of the site are likely to remain perched but maintain perennial or intermittent status, while in the floodplain of the Jones Falls these are intended to be perennial and connected to ground water.
    d. Large portions of currently forested land directly adjacent to the stream may be too wet after construction to support forest, resulting in a low amount of future tree canopy. How will this lack of tree canopy affect the trout?
        - All portions of the main stem of the Jones Falls are proposed to be planted with hydrophytic trees and canopy will be reestablished. We do not believe any portions of the site will be unsuitable for establishment of trees.

e. Please provide documentation that all of the proposed streams are beneficial and sustainable. For example:
   i. The stream flowing from the pond could connect with the main stream much sooner, rather than crossing the entire field.
      - These streams were historically straight-line ditched to the mainstem. They provide critical function through their form and vertical position as refugia for fry and young of year fish. These streams provide critical missing habitat within this and most other watersheds in the Piedmont physiographic province. They are seated in the groundwater table and have perennial characteristics. They have short-term herbaceous canopy as well as will have changing function and values as trees mature adjacent to them, and serve as a vital connection between floodplain wetlands and the mainstem channel. Extending their length and sinuosity rather than connecting sooner with the mainstem of Jones Falls provides additional habitat. Sinuosity of streams of this type between 1.2 and 1.5 is appropriate with natural reference as stated in the report.
   ii. The proposed braided/multi-thread stream, as you mention that this section is currently receiving a high sediment load.
      - This system will continue to be braided and sort sediment. Its position and character will change over time, as it currently does. However, it will have an integrated floodplain and not be entrenched, so long term aggregation is likely. Additionally, it is less likely that a predominant gravel/ sand sediment source from the reach itself will be diminished through restoration. Additional facet stability is anticipated to have a higher quantity of stable habitats, and particularly pools, following restoration. This is all detailed in the performance standards presented in the report.

f. Plans
   i. The "Best Management Practices for Working in Nontidal Wetlands, Wetland Buffers, Waterways and 100-Year Floodplains" on Sheet 1 says instream work cannot occur between April 30 and October 1. This should actually say that work cannot occur between October 1 and April 30.
      - This has been corrected.
   ii. Plans should include all elements in the Phase II Mitigation Plan checklist (attached). For example: referenced cross-sections (including some that show existing wetlands), existing and planned groundwater elevations, microtopography, woody debris, 6 inches topsoil, organic matter, methods for decompaction, slopes of 6:1 or less, etc.
      - Information requested will be provided in the final plans.
   iii. Please show locations of deer fencing and signs.
      - Information requested will be provided in the final plans.
   iv. Additional details are necessary for the wetland design.
      - Information requested will be provided in the final plans.
   v. Wetland enhancement areas should be split out from wetland restoration areas.
      - This information is presented in the Compensatory Mitigation Plan.
   vi. Clearly show what areas will be what types (e.g., PEM versus PFO).
      - This information is presented in the Compensatory Mitigation Plan.
   vii. Please consider planting the riparian areas at a thick enough density to get forest. Are you

assuming this area will be too wet to allow even the most water-loving trees?

- Planting will be dense enough to attain stream canopy with hydrophytic vegetation. The area is not anticipated to be too wet to support hydrophytic tree species.

viii. You mention sewer lines. All easement and utilities should be clearly shown on the plans.

- No sewer lines are located within the project limits and the project as currently designed does not intersect any easements or utilities.

ix. Planting plans

1. Include a plan sheet clearly showing the location of each planting area. It appears that some areas proposed to be buffer (stream and/or wetland buffer) are not going to be planted, even though they are not forested now. All areas proposed as buffer that are not forested (or are currently forested but will be disturbed) should be included in the area to be planted with trees.
   - This information is presented in the Compensatory Mitigation Plan.
2. The planting plans should include the number of each plant species.
   - This will be clarified in the final plan.
3. The detail for the balled tree planting (Sheet 16) shows that the hole will be dug deeper than the root ball. This is not the commonly utilized practice, as it could lead to the tree sinking over time and rotting from being planted too deeply.
   - This will be re-evaluated and an updated detail will be included in the final plan.

x. Sheet 29 does not seem to take the "Best Management Practices for Working in Nontidal Wetlands, Wetland Buffers, Waterways and 100-Year Floodplains" or the unique nature of the project into account. For example, you propose to use Common Lespedeza. What is the actual Latin name for that species, as there are some Lespedeza species considered to be invasive within wetland mitigation projects. While you will need to meet the stabilization standards, this section should also support the project goals and not introduce invasive or persistent non-native species. Please review this section to be sure it is consistent with the "Best Management Practices for Working in Nontidal Wetlands, Wetland Buffers, Waterways and 100- Year Floodplains." Any species to be seeded or planted in the wetlands, wetland buffers, or floodplain should be native or non-persistent.

- Native an non-persistent vegetation will be utilized and will be reflected in the final plan.

15. Exhibit F Performance Standards

a. Please also add the monitoring reports to RIBITS.
   - This comment does not apply to a PRM project.

b. Please use the most recent Performance Standards (attached). For example, the April 2018 version only allows for 35% Loblolly Pine.
   - Per a comment from another regulatory agency, loblolly pine will not be utilized on the site.

c. The Performance Standards summary table should also include information for each area – since many Performance Standards are determined on a plot, well, field or cell basis.
   - Performance standards for the site will be in accordance with MDE's performance standards for permittee responsible sites.

d. Wetland Areas – Restoration and Enhancement

i. Please provide better justification for the site being allowed to have higher amount invasive

species than the standard. Just because the site currently has 50% invasive cover is not enough justification. For example, the entire watershed is very disturbed and has a high amount of invasive species.
- The standard 10% will be used per MDE's guidance.

ii. Please note that "Aerial Cover Vegetative Standards" in year 5 and following years only allows for 15% non-native or upland species. This may be less than the 25% relative cover allowed in the "Invasive Species" section.
- Aerial Cover Vegetative Standards will be used in accordance with MDE's guidance.

iii. The "Invasive Species" section says this standard must be met by year 5, when it actually needs to be met every year.
- Invasive Species Standards will be used in accordance with MDE's guidance.

iv. What is the justification for a limit of 13% for individual colonies of invasive species? This may be too high for some species.
- Invasive Species Standards will be used in accordance with MDE's guidance.

e. Buffer Areas - Enhancement
   i. What about the stream buffers – will they follow monitoring protocol for buffer area enhancement?
   - The monitoring protocol for buffer area enhancement will be followed.

   ii. It may be helpful to include a map showing what areas will follow the buffer Performance Standards. Will this include all areas in the Mitigation Credit Map shown as buffers?
   - This comment does not apply to a PRM project.

   iii. Please provide better justification for the site being allowed to have higher amount invasive species than the standard. Just because the site currently has 50% invasive cover is not enough justification. For example, the entire watershed is very disturbed and has a high amount of invasive species.
   - The standard 10% will be used per MDE's guidance.

   iv. Please note that "Aerial Cover Vegetative Standards" in year 5 and following years only allows for 15% non-natives. This may be less than the 25% relative cover allowed in the "Invasive Species" section.
   - Aerial Cover Vegetative Standards will be used in accordance with MDE's guidance.

   v. The "Invasive Species" section says this standard must be met by year 5, when it actually needs to be met every year.
   - Invasive Species Standards will be used in accordance with MDE's guidance.

   vi. What is the justification for a limit of 13% for individual colonies of invasive species? This may be too high for some species.
   - Invasive Species Standards will be used in accordance with MDE's guidance.

f. Will the preservation area be maintained until the Long-Term Steward takes over? Please provide some description on how it will be maintained until Bank Closure.
   - This comment does not apply to a PRM project.

16. Exhibit G Crediting and Debiting Procedures
   a. Stream credits
      i. Proposed stream enhancement and restoration credits should be justified using a function-

based stream assessment. The assessment can consider both functional uplift as well as site selection factors. All functional goals will need to be paired with an appropriate monitoring protocol and performance standards.

- Determination of stream credits is documented in the Compensatory Mitigation Plan.

ii. In order to get the full 1:1 credit for stream restoration, it will need to be demonstrated that this is a full stream restoration.

- Determination of stream credits is documented in the Compensatory Mitigation Plan.

iii. You are proposing 1:1 credit for each of the multiple braids/threads. This high credit ratio for each of these streams may not be justified, especially since Jim Morris said at the April 2 2019 IRT meeting that these multi-threads may consolidate into a single thread over time.

- Determination of stream credits is documented in the Compensatory Mitigation Plan.

iv. You requested a 1.25:1 credit ratio for some of the newly proposed zero-order streams. Some of these smaller streams may not be justified in the design, and may not even be sustainable. Additionally, this credit ratio is likely too high for their proposed functioning.

- Determination of stream credits is documented in the Compensatory Mitigation Plan.

v. You are proposing 10:1 for aquatic organism passage above the dam. This will need more justification. What species will be have improved aquatic passage? Are there other fish passage barriers upstream? Will the golf course management allow fish habitat? Will you be monitoring this increased fish passage pre- and post- construction?

- Determination of stream credits is documented in the Compensatory Mitigation Plan. Credit for aquatic organism passage above the dam is no longer being proposed.

b. Wetland credits

i. The proposed credit ratios should be based on functional uplift. For example, enhancement of farmed wetland may receive a 2:1 ratio while enhancement of degraded emergent wetland to forested wetland may receive a 4:1 ratio, depending on the uplift. Proposals to enhance the understory of a forested system will receive much less credit, if they get any credit. There is relatively little discussion in this MBI about existing or proposed wetland functions. The wetlands almost seem like an after-thought.

- Determination of wetland credit ratios is documented in the Compensatory Mitigation Plan.

ii. The wetland enhancement areas should be broken out based on the level of functional uplift. For example, enhancement of farmed wetland, degraded emergent wetland, degraded forested wetland, etc.

- Determination of stream credits is documented in the Compensatory Mitigation Plan.

iii. Was the “wetland removal area” subtracted from the total wetland credit?

- Yes.

c. Wetland buffer credits

i. It seems like some of the language in this section is not necessary and is more discussing general IRT policy. Please only include what is relevant to this project.

- Comment noted.

ii. Please provide more detail on what BMPs would be included in the buffer enhancement area. We cannot determine if these practices are acceptable without having more detail.

- No BMPs are being proposed due to extensive reduction in agricultural use and greater

width of buffer provided.

iii. Establishment of warm season grassland or wildflower and pollinator meadow as part of the wetland buffer enhancement area will also need to be discussed. Generally, the preference is for a forested buffer. Please explain why your proposal is preferable and discuss long-term management of these areas. For example, these types of systems will require long-term management to maintain their condition.

- These areas are proposed to be planted with woody species to meet MDE's vegetative standards.

d. Table 3 Wetland Ratios and Credits. Is the buffer all preservation, with no buffer enhancement proposed?

- This is currently under negotiation with the project reviewer.

e. Mitigation Credit Map

i. Please avoid using acronyms in the legend, unless they are defined on the legend.

- Comment noted; acronyms have been defined.

ii. Can you increase forest along the stream?

- Yes, the forested areas adjacent to the stream are being enhanced.

iii. Please add the credit ratios to the map.

- Comment noted; credit ratios have been added to the map.

iv. What is the benefit of having an overall credit map, then also having separate credit maps for each type of credit? You can probably eliminate the maps with the separate credit types.

- Comment noted; the maps have been consolidated into one map for all credits.

v. Buffers

1. The "proposed 50' buffer" is not visible. Do you need the buffer lines, since you are also showing them as a filled-in color?
   - Buffer has been revised to be more clear.
2. Buffers should be clearly split by what is buffer preservation and what is buffer enhancement.
   - These two areas are distinctly different on the current mitigation map.
3. I assume "Wet BP - PFO" means Wetland Buffer Preservation? However, these areas are not proposed to be planted in the Landscape Plans, even though they are currently farmed.
   - Based on the current mitigation map, these areas will be planted.
4. Throughout this MBI, it is difficult to determine what will happen in the buffer – as the Credit Maps do not always match the Landscape Plans.
   - This will be clarified on the final plan and the credit maps will match the landscape plans.
5. Clarify what will happen in the "0-25' Buffer Area", as these should also be forested.
   - Based on the current mitigation map, these areas will be planted.

17. Exhibit H. Crediting Release Schedules

a. The credit release schedule should reserve a larger amount until the final year of monitoring, to provide the IRT with more assurance of project success. Please adjust the schedule accordingly.

- This comment does not apply to a PRM project.

b. Table 1. For the basic requirement column, "Meeting Performance Standards for Year Monitored" - include the year (e.g., Year One).
   - This comment does not apply to a PRM project.However, the site will meet MDE performance standards throughout the monitoring period. If the site falls short of meeting MDE standards, adaptive management will be implemented to ensure success.

18. Exhibit I. Credit Sale Statements. MDE should be included in the language (e.g., provide a copy of the ledger and letter to MDE, MDE may re-evaluate approval of bank, MDE may withdraw or terminate approval).
    - This comment does not apply to a PRM project.

19. Exhibit M Long-Term Management Plan
    a. Appendix A Bank Easement Plat. I assume this document will be included with the next version of the MBI.
    b. Appendix C Invasive/Non-Native Species Fact Sheets. I assume these documents will be included with the next version of the MBI.
    c. Appendix D Long-Term Management Fund. The estimate should include cost for maintaining and replacing signs, easement trespass, legal fees (unless this is a separate account), stream structures, erosion, etc.
       - This comment does not apply to a PRM project.

20. Exhibit N Adaptive Management Plan. Please include the Adaptive Management Plan.
    - An Adaptive Management Plan is included in the Compensatory Mitigation Plan.

21. Exhibit O Catastrophic Events Fund
    a. Please ensure this section is consistent with recently approved MBIs in Maryland.
    b. This fund should include money for a stream blow-out.
    c. You may need to revise the estimate based on changes to language and what events are included as catastrophic.
       - This comment does not apply to a PRM project.

22. Exhibit P Financial Assurances
    a. The initial release financial assurance estimate should include detail on how the cost was derived, not just final numbers for each aquatic type.
    b. The bank operation financial assurance estimate should include erosion, cost for stream maintenance, etc.
       - This comment does not apply to a PRM project.

23. Additional comments are included as track changes and comments on the Draft MBI, Exhibit F, and Exhibit G documents.
    - This comment does not apply to a PRM project.

24. Matt Hynson will also be providing comments on the Draft MBI.
    - Comments are addressed below.

25. Please continue coordinating with Baltimore County Department of Environmental Protection and Sustainability and the IRT.
    - Since this is now a State project, coordination with Baltimore County will no longer be required.
    - Comments from March 2019 were addressed and JMT has received no response.

26. Please continue coordinating with Anna Hjelmroos and Matt Hynson on the Joint Permit Application.
    - This project has been reassigned to Jennifer Bird (MDE) and Steve Elinsky (USACE).

Matthew Hynson Comment Response

1. MDE will need a hydraulic model for proposed stream and floodplain conditions to evaluate the stability of the restoration design. Per MDE regulations, the modeling results should compare velocity, shear stress, and water surface elevation for existing vs. proposed stream conditions. It is understood that this will be provided with the next phase of the design. MDE will likely have additional comments related to the hydraulics of the proposed design.
   - A hydraulic model for proposed and existing conditions will be provided with the Final Mitigation Plan.

2. The detailed plan set should include longitudinal profiles for each of the proposed stream channels.
   - Profiles will be included for the Final Mitigation Plan

3. The plans or associated attachments should provide a detailed sequence of construction that explains how the project will be phased to minimize the potential of adverse impacts to the existing trout population.
   - A sequence of construction will be provided with the erosion and sediment control plan, part of the Final Mitigation Plan.

4. The Erosion & Sediment Control Plans should show pump-around locations where the stream channel is not being built offline.
   - Pump around locations will be shown as compliant with an approved final erosion and sediment control plan.

5. The "Profile" measurement within the Stream Performance Standards mentions that the stream will be monitored for "significant alterations in locations, depths, and slopes of stream features". How do you define "significant" alterations? Will the monitoring include longitudinal profile(s)?
   - Anything deemed significant would be highlighted for agency review and referral to adaptive management if necessary. Significant would be anything seen as indicating change of flow, channel shifts, downcutting, or corresponding with noted degradation of the reach.

6. Table 3: Functional Uplift Goals is not filled out as to which years these goals will be evaluated. Some measurements, like removal of the dam, do not need to be monitored yearly, but others will. For example, what years will trout/macroinvertebrate monitoring occur?
   - These monitoring criteria occur for every monitoring event as stated in the plan in order to compare progress with baseline pre-construction data.

7. There are potential concerns about the loss of canopy cover associated with grading in the Downstream Forested Reach. At the April IRT meeting, it was briefly mentioned that the grading in this area would be limited to the extent of the lower quality forest. Please elaborate on that statement. Do you expect the stream to still have shading given this grading plan? Any additional information you can provide on the project's plans to mitigate negative thermal impacts associated with the loss of canopy cover in the Downstream Forested area would be helpful.

- The final mitigation plan will show the 6" surveyed trees, proposed tree saves and tree takes. The planting plan and monitoring / performance criteria emphasize the planting of both woody and herbaceous shade species and establish channel canopy as a performance requirement. We anticipate quite a bit of remaining shade over this channel in the graded locations, however as the report states the site as well as most of the Greenspring Valley is experiencing significant loss of green ash canopy. This will result in significant loss of canopy at the Eccleston site, and is confirmed through the last three years of site observation. Thermal transducers are already recording increase of temperature through the project site due to canopy loss as compared with previous years. This project will result in some temporary losses of canopy, but will result in more canopy through the monitoring period than a no-action alternative. **Good quality and high quality canopy portions of the site are to be preserved without earth disturbance.** Groundwater interaction is also shown to decrease channel temperatures, as noted in the study conducted by Land Studies previously provided to the IRT. The downstream forested area is proposed to retain almost all canopy trees and have supplemental planting.

8. Please elaborate on the rationale for the proposed zero order stream channel flowing from the PUB wetland area to the North tributary. I would expect a stream flowing from a ponded area to be adding warmer water to the receiving tributaries, potentially counterproductive to the thermal goals of the project. Additionally, the proposed alignment takes this channel so close to the mainstem at station ~104 that I would expected it would eventually connect here instead of flowing several hundred feet down-valley.
   - The zero order streams proposed are highly connected to the groundwater table, situated on the basal gravel layer in the groundwater table. Additionally the quarry would only overflow into the stream in large rainfall events and periods of elevated groundwater, which is expected to have minimal thermal impact on the stream as in those conditions the discharge would be similar runoff temperature as what is already in the stream, or groundwater expression. Monitoring has also shown that the quarry water temperature is groundwater connected and cool in comparison to perched portions of tributaries on site due to the shading of the quarry and groundwater connection. We do not expect the mainstem to connect to these side zero order tributaries due to the incredibly low resulting channel stresses in both mainstream and tributaries following restoration. However, in the event this did occur, channel braiding would be the anticipated result, still preserving the use and function of these tributaries as valuable fishery / juvenile refugia.

9. There is some concern that certain tributaries (for example, the lower section of the North tributary) may be flowing further down-valley than would be expected under reference conditions. Please provide rationale for this alignment. A lower stream credit ratio may be applied to portion(s) of these tributaries.
   - All of these tributaries have been ditched and straightened as shown by historic aerials and trenching investigation. Therefore, by default, they would have tied into the mainstem of the Jones Falls further downstream than their existing locations, as their length was shortened and their slope steepened for drainage purposes. All tributary design is based on historic trench investigation and natural channel references for sinuosity. We remind MDE that they have reviewed multiple other projects with forced additional sinuosity, and that if it were the case that JMT wished to derive additional stream credit through sinuosity, there would be little reason to stop at the conservative 1.2-1.4 sinuosity which we

have used for this project. All of our C4 stream type, cold water reference data indicates that a sinuosity of 1.2-1.5 is appropriate for these streams in this valley type, and that increasing sinuosity within these reference parameters is an appropriate restoration strategy for channels which have been impacted through straightening and ditching. We further remind MDE that without channel sinuosity, it is difficult to establish the variety of facets and channel features which provide essential fishery function, such as deep and varied pools, overhead cover, and variety of natural riffles situated on native gravel substrates. This site does have some portions of tributaries which are well-suited for B type streams with low sinuosity, and these are found in the valley sides where slopes are steeper and tributaries enter the site. In regards to a lower ratio for these streams, we feel that if these restored systems were impacted, a minimum credit requirement would be a 1:1 ratio, and therefore 1:1 credit is justified for their restoration; particularly, as these are restring length to historically impacted systems.

10. Please provide rationale for the labeled perennial flow status of the zero order tributaries. A stream credit ratio of 1.25:1 for the zero-order tributaries is ambitious, particularly if these tributaries experience intermittent/ephemeral flow. Can you provide an approximate location as to where you these tributaries to encounter groundwater/perennial flow?
    - Any portions of the zero-order streams in the main floodplain of the Jones Falls are anticipated to be perennial due to the groundwater connectivity of this area, as located through trenching investigation where groundwater, gravel, and hydric soil indicators were observed. The rest would classify as intermittent, as they would likely receive groundwater in most instances save extreme droughts. All would receive storm flow. Intermittent portions of the streams would be at the limit of the LOD, where the channel is steepest.

11. Appendix A: Stream Proposed for Aquatic Organism Passage shows that a significant length of stream outside of the mitigation bank site is proposed for fish passage credit. Stream length proposed for fish passage credits can be determined in accordance with the considerations set forth in USACE Regulatory Guidance Letter 18-01 - Determining Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures. Has the off-site stream reach been analyzed for upstream blockages to fish passage? Additionally, the project will need identify which species will benefit from the dam removal and whether they can be reasonably expected to utilize the 2,000+ linear feet of stream proposed for credit off of the project site. As noted at the April IRT meeting, there are concerns that there may be significant blockages to fish passage off of the project site. Areas upstream of these blockages may not receive credit if they are not passable.
    - AOP credit is no longer included for the project.

    a. The permit issued by MDE may include a condition specifying fish relocation within the work areas.
        - We anticipate fish relocation to be part of the special condition of the permit, as coordinated with DNR in previous meetings.

    b. Please evaluate the swale south of the Railroad Tributary for potential resources that may not have been included in the initial delineation. If additional resources are found within the project LOD, please revise the impact numbers.

- We have found an addition jurisdictional stream which formerly was outside our area of review but is now included in the project and JD.

c. It was discussed in the IRT that the numerous South tributaries and the floodplain/wetlands between them will likely become a depositional area. Given this, is it expected that these tributaries will experience significant lateral migration? How do you expect that this will affect the overall stream length on the site in the future? The IRT may ultimately need to consider a different stream crediting rationale for braided areas that migrate and gain/lose stream length over time. Additionally, if these tributaries migrate laterally, do you expect them to be vertically stable in the long term? Please justify.

- These tributaries are braided to better handle the sediment boundary condition. This will effectively route the sediment, though position of the streams may vary slightly. This is observed in today's condition, however the confluence with the Jones Falls has been flipping position over 100' regularly. The restoration will create a greater stability of temporal availability of habitat in these locations. We do not have concerns for vertical stability due to the lowered channel stresses and grade control proposed. We do not anticipate net channel length to shorten in the long term, however should it occur a crediting change is possible, similarly, should they lengthen or add channels we would anticipate additional credits to be generated.