Attachment A: Response to Comments on the Final Environmental Impact Statement

Attachment A: Responses to Comments on the FEIS

A-1 INTRODUCTION

This attachment summarizes and responds to comments on the Final Environmental Impact Statement (FEIS) for the Tappan Zee Hudson River Crossing Project. The cover sheet of the FEIS was signed by the New York State Department of Transportation (NYSDOT) and the New York State Thruway Authority (NYSTA), acting as joint lead agencies, on July 24, 2012 and by the Federal Highway Administration (FHWA), acting as federal lead agency, on July 25, 2012, and the document was made publicly available. A Notice of Availability was published in the Federal Register on August 3, 2012, which established the public review period for the FEIS. Written comments on the FEIS were accepted through September 4, 2012.

New or substantive comments received on the FEIS and responses to each are provided in Section A-2 below. Some comments have been summarized or grouped when similar views have been shared by multiple commenters, but the substance of each comment has been preserved. The name of each commenter(s) is indicated at the end of each comment. In instances where all or portions of comments were previously addressed in the FEIS, the response herein refers to Chapter 24 of the FEIS. The comment letters and emails are provided in **Attachment B**.

A-2 RESPONSES TO COMMENTS ON THE FEIS

A-2-1 CHAPTER 1: PURPOSE AND NEED

C 1-1: Although the Tri-State Transportation Campaign continue to believe that transit should be included in the EIS alternatives analysis, if it is not, the state must ensure that the final bridge design does everything possible to not preclude transit. This means considering how each element of the bridge could impact or limit transit options in the future. The DEIS and FEIS have not conclusively proven this project will increase mobility through widening lanes and adding shoulders. Accordingly, transit remains the only way to actually increase mobility in the corridor and must not be precluded. (Vanterpool and Pellecchia)

C 1-2: Please see the responses to Comments 1-6, 2-34, and 2-46 of Chapter 24 in the FEIS.

A-2-2 CHAPTER 2: PROJECT ALTERNATIVES

A-2-2-1 NO BUILD ALTERNATIVE

C 2-1: At the Public Hearing, it was stated that "it has been estimated that it would take approximately $1.3 billion in the next decade to maintain the bridge's viability". This is not the same as the $700 million/year figure that is currently being used. Please explain this discrepancy. (Winoker)

R 2-1: As stated in the FEIS, NYSTA estimates that approximately $1.3 billion is required to maintain and repair the existing structure over the next decade. This estimate is documented in Appendix A-6 of the FEIS. The $700 million per year maintenance cost cited above is not correct.

A-2-2-2 REPLACEMENT BRIDGE ALTERNATIVE / SELECTED ALTERNATIVE)

C 2-2: Composite materials cannot be used to reduce future maintenance costs on the existing structure or on new structure. (Winoker)

R 2-2: To maximize the public investment in a new Tappan Zee Hudson River crossing, the Selected Alternative is being designed with a lifespan of at least 100 years before major maintenance or rehabilitation is needed. The replacement bridge will be designed with appropriate materials to meet this objective.

A-2-2-3 FINANCIAL PLAN

C 2-3: The new bridge should be funded through taxes on new residential development in the Lower Hudson Valley. (Kwasnicki)

R 2-3: The New York State Thruway Authority (NYSTA) is not authorized to levy revenues through real estate or development taxes.

C 2-4: Although there has been considerable reporting in the print media regarding financing of the Selected Alternative, nothing definitive is included in the FEIS in regards to how the project will be funded. The FEIS document states that the completeness of the DEIS is not dependent upon a financial plan being provided for the Tappan Zee Hudson River Crossing Project. It is difficult this since the funding component of the project has such a major impact upon the project and the region. The failure of any environmental review document to address the financing issue is a severe shortcoming of the entire environmental review process. The financial plan should be detailed and comport with the FHWA Financial Plans Guidance. (Fixell, Vanterpool and Pellecchia)

R 2-4: Although a detailed financial plan was not available at the time of the publication of the FEIS, the FEIS identifies toll revenue bonds, among several options, as a reasonably-available funding program for the project (see Chapter 2, “Project Alternatives”). The FEIS documents the potential environmental effects of toll adjustments to support these bonds based on a conservative assumption that they would fund the project in its entirety. Consistent with FHWA requirements, there must be a demonstrated,

reasonably-available funding program for a project before a Record of Decision (ROD) can be issued, but the completeness of the DEIS and FEIS are not dependent on the inclusion of a detailed financial plan.

C 2-5: With higher tolls and absence of public transit, a new bridge would in effect create a block between Rockland and Westchester, rather than allowing for easier flow of traffic for work, entertainment and shopping trips. (Mausner)

R 2-5: The FEIS includes an assessment of the potential environmental impacts of using toll revenue bonds to finance the Selected Alternative. The FEIS concluded in Chapter 4, "Transportation," Chapter 8, "Socioeconomic Conditions," and Chapter 19, "Environmental Justice," that proposed toll adjustments would not result in a diversion of a substantial number of vehicle trips, dramatic changes in work and non-work travel patterns, or disproportionately high and adverse impacts on environmental justice communities.

A-2-2-4 TRANSIT

C 2-6: In its submission concerning the DEIS, the Village of Tarrytown made reference to comments dating from October 2006 that a hard look be given the concept of a Tappan Zee Bridge Bus-Train transfer station being constructed as part of the toll plaza. This issue was not addressed in the DEIS or the FEIS, and it remains the position of the Village of Tarrytown that such a transfer station would provide, among other benefits, significantly reduced travel times. Similarly, such a transfer station would also greatly enhance the flexibility of all other inter-county bus routes by allowing every bus crossing the bridge to provide transfer service to the Metro-North trains. The transfer station would also mitigate the negative environmental impacts associated with the continuation of the existing Tappan Zee Express bus service traversing the Village's streets when driving to and from the current Metro North Railroad (MNRR) station, as well as any negative impacts likely to result from future expansions in bus service, including a Bus Rapid Transit system. The transfer station would also provide significant benefits to the multitude of residents who live near the toll plaza, including and especially providing pedestrian access to MNRR. Such access not only would mitigate a portion of the adverse environmental impacts the new bridge will impose directly on those residents, but also would provide the broader environmental benefit of eliminating the need for those residents to utilize automobiles to travel to the current train station. The FEIS is silent in relation to this concept and it is the position of the Village that because of the concept's numerous benefits, in particular its potential to mitigate adverse environmental impacts, a Tappan Zee Bus-Train transfer station should have been evaluated as part of the environmental review process. (Fixell)

R 2-6: Please refer to the responses to Comments 2-34 and 2-39 in Chapter 24 of the FEIS.

C 2-7: In the March 30, 2012 submission from the Village of Tarrytown, the Village referenced Mayor Fixell's comments at the March 1, 2012 public hearing, in which Mayor Fixell reiterated the statements contained in the November 3, 2011 letter concerning the need for mass transit on the new bridge, especially that the inclusion of mass transit will mitigate many of the adverse environmental impacts that the bridge creates for the Village of Tarrytown, the County and the region. The FEIS reiterates statements in the DEIS asserting that mass transit is beyond the scope of the project and that the new bridge will be constructed in a manner to accommodate mass transit in the future. However, it remains the position of the Village that mass transit, specifically Bus Rapid Transit (BRT) or other enhanced bus service, must be explicitly committed to and should be considered now rather than later. Absent that, there can be no assurance that the region will ever see mass transit on the Tappan Zee Bridge and, therefore, that there will be substantially less mitigation of the significant adverse environmental impacts associated with the new bridge. (Fixell)

R 2-7: The DEIS and FEIS identify measures to mitigate the adverse impacts of the Selected Alternative, which are also described in Section 7 of this Joint ROD and Findings Statement. See also the responses to Comments 2-11 below and Comment 2-36 in Chapter 24 of the FEIS.

C 2-8: Many of Rockland and Westchester County's concerns have been addressed subsequent to the issuance of the FEIS with the six points in the inter-municipal agreement established by Governor Cuomo, Westchester County Executive Rob Astorino, Rockland County Executive C. Scott Vanderhoef, and Putnam County Executive Mary Ellen Odell. Those points are as follows:

- 1) Dedicated bus lanes will be incorporated on the bridge from the start. (Point #1 acknowledges using the emergency access lanes on the new bridge during peak hours, and recognizes the need to accommodate Rockland County's existing TZx bus service.)
- 2) The bridge will be constructed with mass transit capacity compatible with a Bus Rapid Transit (BRT) system and Commuter Rail Transit.
- 3) A Regional Transit Task Force will be created to study costs and options for regional transit, including commuter rail and a BRT system on the bridge and key portions of the Westchester Rockland corridor.
- 4) The Task Force will issue recommendations in one year, with a plan for short-term steps that can be considered for immediate commencement, as well as long-term plans for transit solutions. (Point #4 addresses many of our comments, including, in the short-term, bus-on-shoulder and a slip ramp at Tarrytown.)
- 5) Incentives will be created for contractors that could be used to reinvest in regional mass transit or to moderate impact on toll-payers.

- 6) Establish a working group of Thruway, State, Federal and local officials to examine ways to keep toll increases to the minimum necessary, including maximizing federal support, expanding discount programs for regional residents, and financing mechanisms that lower the cost of credit and borrowing. (Point #6 will address many of Rockland County's funding and toll concerns, and we again look forward to participating within this working group.)

Rockland and Westchester County request that the six formally-agreed upon points be reflected in the Tappan Zee Hudson River Crossing Project Record of Decision. (Vanderhoef, Buroughs)

R 2-8: Public investment will also be optimized under the Selected Alternative by improving the operational flow of all traffic across the bridge through its improved configuration (e.g., 4 full time lanes, full shoulders, and wide emergency access lanes in each direction). The flexible configuration of the Selected Alternative offers New York State the opportunity to study and implement other short-term and long-term transportation improvements that may become practicable over the lifespan of the new structure (e.g., commuter rail or bus rapid transit). The Selected Alternative does not preclude these options, but rather creates a forward looking window to help meet evolving transportation needs at this crossing.

New York State has committed to study other operational and modal options that could use the flexibility in the Selected Alternative's configuration. For example, the Selected Alternative's configuration could support the ability for express bus services to use the extra width on the bridge during peak hours. This use would have to be appropriately assessed and considered before being implemented. Details such as the number of buses merging into general traffic (although limited) would have to be assessed operationally. The timing of any such study could be coordinated such that it is completed and implemented, if appropriate, by the time the bridge opens to traffic. FHWA will continue to work with the State to assure that the benefits and impacts of any such investment are appropriately assessed.

C 2-9: Consider future use of temporary construction access road as Bus Rapid Transit access road to Tarrytown station. The final EIS does not provide a response to this specific suggestion. (Buroughs)

R 2-9: Please see the responses to Comments 2-34 and 2-39 in Chapter 24 of the FEIS.

C 2-10: Ensure ability for "ready-to-operate Bus Rapid Transit" (BRT) across the full project limits. The final EIS does not describe the specific improvements that must be incorporated in the bridge approaches to ensure that BRT service can be provided when the new bridge opens. (Buroughs)

R 2-10: As stated on page 2-6 of the FEIS, "implementation of future transit service would require modifications at the bridge landings to tie in to upland infrastructure for bus and/or commuter rail operations. There are various

options for such upland connections." The specific design of the upland connections is outside the scope of this EIS and would require subsequent study.

C 2-11: The Record of Decision should include a statement that the exit/entrance to the Emergency Access Lane (Bus Rapid Transit lane) on each new bridge span will be designed to extend through the new toll plaza area and under the Route 9/South Broadway Bridge so that it can be used for transit immediately upon completion of the new bridge. (Buroughs)

R 2-11: See the above response to Comment 2-10.

C 2-12: There remains no plan for the incorporation of a mass transit system on the bridge and no analysis of the impacts of building a new crossing with mass transit. The state rejects the inclusion of mass transit on a new bridge[s] and excludes it from further analysis primarily for cost reasons, despite the fact that the DEIS and FEIS do not contain detailed cost estimates for different types of mass transit that could be implemented on a new crossing. (Musegaas and Verleun)

R 2-12: The response to Comment 2-46 in Chapter 24 of the FEIS identifies specific measures outlined in the Design-Build Contract Documents to allow for a potential future (transit) load on the replacement bridge. Chapter 2, "Project Alternatives," describes cost considerations for two transit options in the corridor (commuter rail and BRT). The report that details these transit cost estimates was posted to the project website (www.newnybridge.com) on July 6, 2012 prior to publication of the FEIS and was referenced in the FEIS.

C 2-13: The Tri-State Transportation Campaign believes that NYSTA should allow buses to use the extra width in the emergency access lanes during and beyond the peak period. The state, through the FEIS, should commit to this modification which would allow buses to bypass congestion and thereby provide further incentive for public transportation use. (Vanterpool and Pellecchia)

R 2-13: See the above response to Comment 2-8.

C 2-14: The FEIS anticipates that there "could" be the ability for express bus services to use the extra width on the bridge during peak hours, to avoid the mobility constraints to which private vehicles are subject. At an absolute minimum, the ability for existing express bus service to move more efficiently through the corridor is a must. As it stands today, there is very little incentive for residents to use the bus service, since it will be stuck in the same traffic that all other vehicles are subject to and cannot be relied upon. Concrete plans for how to begin construction of a BRT system at least between the Palisades Mall and White Plains should be developed immediately. While it will bring the cost of the project up to some extent, it will be less expensive to do it now than do it at a later date and will maximize the value of the public investment in this project. A Tarrytown connector, to bring bus service efficiently from the bridge to the Tarrytown train station, should be

implemented immediately, as this relatively small investment would greatly increase efficiency for a large number of commuters from Rockland County. (Carlock)

R 2-14: See the responses to Comments 2-32, 2-34, and 2-39 in Chapter 24 of the FEIS.

C 2-15: It is imperative that the Governor's recently announced Mass Transit Task Force must not only issue "recommendations" after a year of study, but have a solid plan ready to put into action to add mass transit in some form to the Tappan Zee corridor. (Carlock)

R 2-15: Comment noted.

A-2-2-5 ALTERNATIVES CONSIDERED

C 2-16: In the March 30, 2012 official submission from the Village of Tarrytown concerning the DEIS, the Village reiterated a request that was originally included in the Village of Tarrytown comments on the Scoping Document dated November 3, 2011 that a hard look be given to the alternative concept of constructing one new bridge to the north of the existing bridge (to serve westbound/northbound traffic) and rehabilitating the existing bridge (to serve eastbound/southbound traffic). There is nothing in the FEIS addressing this concept, other than the statement in Executive Summary that the EIS considers two alternatives (No Build and Replacement Bridge) and that other alternatives, including Rehabilitation, Tunnel and Single Structure were determined "not to be reasonable because they would not meet the project's goals and objectives". However, the concept noted herein was never evaluated in any environmental document. (Fixell)

R 2-16: The Scoping Information Packet, the DEIS, and the FEIS presented bridge rehabilitation alternatives based on the Alternatives Analysis for Rehabilitation and Replacement of the Tappan Zee Bridge Report (March 2009), which was part of the Scoping Summary Report for the Tappan Zee Bridge/I-287 Corridor Project. It was widely distributed and the subject of intensive public and agency review and comment. The findings of this report were reviewed in the context of the goals and objectives for the current project (see Chapter 1, "Purpose and Need," of the FEIS).

The concept identified above by the Village of Tarrytown is considered synonymous with two rehabilitation bridge concepts that were identified in the Scoping Information Packet, the DEIS, and the FEIS:

- Replacement Causeway, Rehabilitated Main Span, and Single Level Supplemental Bridge; and
- Replacement Causeway, Rehabilitated Main Span, and Dual Level Supplemental Bridge.

All rehabilitation alternatives were carefully considered and were found not to be reasonable. This finding was documented in the Scoping Information Packet as well as the DEIS and FEIS.

C 2-17: Despite the public's interest in examining the Tunnel, Rehabilitation, and Single Structure alternatives, both the DEIS and the FEIS only presented two alternatives to this Project: the No Build Alternative and the Replacement Bridge Alternative. In the comments on the DEIS, Riverkeeper raised the need to consider and analyze these viable alternatives to the Project; however, the FEIS continued to dismiss these alternatives. The DEIS, and FEIS also fail to include an assessment of a new single or double span bridge with mass transit as a reasonable alternative. Dismissing viable project alternatives before conducting a full study of their impacts, costs, and benefits compared to the project proposal does not constitute a meaningful alternatives analysis. The fact that the Project sponsors have put forth an ad hoc rationale for why they chose to dismiss these three Project alternatives does not excuse them of their legal obligation to conduct a complete analysis that takes the requisite "hard look" at the impacts and possible mitigation measures of all these alternatives equally. (Musegaas and Verleun)

R 2-17: See the response to Comment 2-1 in Chapter 24 of the FEIS.

A-2-3 CHAPTER 3: PROCESS, AGENCY COORDINATION, AND PUBLIC PARTICIPATION

C 3-1: There is no government agency that is capable of monitoring the project to ensure that future transit options are preserved in accordance with various sections of the FEIS. For example, at least one of the following agencies should be involved: Federal Transit Administration; the New York Metropolitan Transportation Council (NYMTC); Metropolitan Transportation Authority (MTA); Public Transportation Bureau, New York State Department of Transportation (NYSDOT); or Westchester County Department of Transportation. While it is very clear that the FEIS requires future transit options to be preserved, it does not identify an agency specializing in transit to make sure these requirements are enforced. (Centolanzi)

R 3-1: NYSDOT and MTA were and remain closely involved in the design of the Selected Alternative, and the Design-Build Contract Documents identify requirements for a potential future load that are consistent with bus and rail design standards.

C 3-2: The recent actions taken by the New York Metropolitan Transportation Council (NYMTC) was a clear violation of NYCRR Part 617. Section 617.11 (c) states: “no involved agency may make a final decision to undertake, fund, approve or disapprove an action that has been the subject of a final EIS, until the time period provided in subdivision 617.11(a) of this section has passed and the agency has made a written findings statement. Findings and a decision may be made simultaneously.” The NYMTC, either defined as a State Agency or a local agency, is in any event an involved agency, which could not make a decision until SEQRA findings have been issued. (Parish, Singer, Sachs)

R 3-2: NYMTC is a Metropolitan Planning Organization (MPO) and does not make final decisions to undertake, fund, approve, or disapprove actions that have been the subject of an FEIS. The MPO role in transportation projects is narrowly proscribed, is exempt from NEPA, and their activities do not constitute an action within the scope of SEQRA.

C 3-3: We are concerned that certain requirements were sidestepped like answering our concerns in the DEIS and not giving us the specifics on mitigation for the Salisbury Point Condominiums. (Sullivan)

R 3-3: Chapter 24 of the FEIS includes all relevant comments on the DEIS with responses to each. The FEIS identifies the Environmental Performance Commitments (EPCs) and other mitigation measures to be implemented during the project's construction, and NYSDOT and NYSTA have and continue to meet with members of the Salisbury Point Cooperative to describe the EPCs and other mitigation measures and answer questions.

C 3-4: The requirement for a responsible public review and involved agency review has not been met. It is not even reasonable to expect that the high level officials responsible for signing off on a Record of Decision could easily, conveniently and reasonably review a 10,000 page document and fairly determine whether or not there has been an adequate response to the substantive comments from affected interested parties and their professional advisers. (Parish, Sachs)

R 3-4: FHWA, NYSDOT, and NYSTA conducted a thorough review of the FEIS, including FHWA staff review by its New York Division, FHWA legal sufficiency review by its General Counsel, and FHWA prior concurrence review by its headquarters staff. FHWA also sought input from Cooperating Agencies in the development of the FEIS, including the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, the National Marine Fisheries Services, the U.S. Environmental Protection Agency, the U.S. Coast Guard, the U.S. Army Corps of Engineers, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer. FHWA determined that the FEIS was complete and that all relevant comments on the DEIS were addressed.

C 3-5: A Findings Statement/Record of Decision should not be issued until the following has occurred:

- The results of the Test Pile program is fully presented and analyzed, mitigation is proposed, and the information is presented in a Supplementary EIS ("SEIS");
- The specific plan which will actually be proposed to be implemented is prepared by the selected Design Build team, and the mitigation proposals it will include are presented in an SEIS for public review and comment; and

- Specific mitigation agreements are entered into with The Quay and Salisbury Point providing receptor site mitigation including but not limited to: building noise insulation; amenity area noise mitigation and receptor barriers; a rodent prevention program; loss of value compensation; parking area security installation and security management (for Salisbury Point).

If the above steps are not taken the EIS review will have been improperly segmented and could not possibly pass the "hard look" test required for a SEQRA/NEPA negative declaration. (Parish, Singer, Sachs)

R 3-5: Please refer to the responses to Comments 3-17, 3-18 and 3-19 in Chapter 24 of the FEIS regarding the claim that results of the Pile Installation and Demonstration Program and the selection of a Design-Build team must be presented in an SEIS.

The FEIS fully analyzes the construction and operational impacts of the Selected Alternative on the Salisbury Point Cooperative and Quay Condominiums. The FEIS identifies abatement measures for the Selected Alternative's adverse noise impacts (see Chapter 12, “Noise and Vibration”), and the FEIS identifies EPCs and mitigation for the project's adverse construction impacts (see Chapter 18, “Construction Impacts”). The FEIS did not identify adverse construction and operational impacts on rodent control, loss of value, parking area security, and security management at the Salisbury Point Cooperative or Quay Condominiums. NYSDOT and NYSTA have and will continue to meet with representatives of the Salisbury Point Cooperative and Quay Condominiums regarding their concerns, but there is no requirement by NEPA that a formal mitigation resolution be reached with these private property owners.

C 3-6: Mr. Parish and Dr. Crossan provided extensive comments with respect to the DEIS. These detailed deficiencies particularly in the noise, air quality and visual impact DEIS analyses. The comments asked for specific mitigation agreements to be entered into for the purposes of mitigating obvious impacts on The Quay and Salisbury Point. There is no specific identified response to these comments in the FEIS. (Parish)

R 3-6: Chapter 24 of the FEIS contains all relevant comments received during public review of the DEIS and responses to these comments. Comments were grouped and summarized as appropriate. Section 3 of Chapter 24 identifies the parties that submitted written and oral comments on the DEIS, and identifies the specific comment number attributable to the commenter. Volume III of the FEIS contains the written comment letters and e-mails, comment forms, and the transcripts of the DEIS public hearings. Comments were received from Mr. Parish and Dr. Crossan and were addressed as reflected in Chapter 24 of the FEIS. See also the responses to Comment 3-4 and 3-5 above.

C 3-7: Subsequent to the DEIS, the Project Team have held a number of meetings with The Quay and Salisbury Point Board members and residents. Various

statements have been made by State officials that vaguely advise that mitigation in addition to what was included in the DEIS is still under consideration and that the selected Design-Build team will be asked to provide additional mitigation. Yet, despite all of these discussions, there have been no specific proposals for mitigating impacts on The Quay and Salisbury Point. This is in clear violation of the SEQRA regulations and, in fact, regulations which were also acknowledged in Section S-5-1 of the FEIS. The mitigation must be presented in an EIS and confirmed in the SEQRA Findings Statement. A failure to do so is a failure to follow the clear requirement of the SEQRA statute. (Parish, Singer, Sachs)

R 3-7: The FEIS identifies measures to mitigate the adverse noise and construction impacts of the Selected Alternative, and these measures are identified in Section 7 of this Joint ROD and Findings Statement. Where mitigation measures cannot fully alleviate the potential adverse impact of the Selected Alternative, the FEIS identifies these impacts as unavoidable (see Chapter 22, “Other NEPA/SEQRA Considerations”).

C 3-8: I am requesting the comment period for the FEIS be extended because of the rather short time allotted for this process. (Singer)

R 3-8: The 30-day public review period for the FEIS complies with NEPA requirements.

C 3-9: The Governor has discussed forming a Blue-Ribbon Panel with some of its tasks being to assist in reviewing the RFPs, obtaining and providing community input for construction and staging impacts, and to have meaningful input to the visual design selection. As one of two impacted host communities, we look forward to participating in this panel. (Vanderhoef)

R 3-9: Comment noted.

C 3-10: In addition, the timing of the issuance of the FEIS demonstrates the state's intention to move forward without adequate public participation. For example, the fact that the FEIS has been issued before the construction bids have been released to the public, or a bidder has been selected, ignores the possibility that the detailed bridge construction proposal could result in different environmental impacts that have not been assessed in a process the state now deems complete. Once the FEIS is finalized and a ROD and SEQRA Findings are made, the public will no longer have an opportunity to provide formal input to the state regarding this project. Considering the fact that this is the largest public works project in the Hudson Valley in decades that will have short and long term impacts on the Hudson River and the region as a whole, it is crucial that the public is afforded a democratic, transparent process that provides every opportunity for meaningful participation prior to the project's approval. (Musegaas and Verleun)

R 3-10: The Tappan Zee Hudson River Crossing Project has met or exceeded all NEPA requirements for public involvement. See also the response to Comment 3-11 in Chapter 24 of the FEIS.

C 3-11: Riverkeeper notes that our concerns regarding the adequacy of the DEIS, and now the FEIS, are consistent with significant concerns raised by the U.S. Fish and Wildlife Service (USFWS) in its comments on the DEIS. In a March 1, 2012 letter to the National Park Service that incorporates its comments on the DEIS included here as Exhibit 1, USFWS expresses concern that the DEIS does not meet the requirements of NEPA and calls on the state to prepare a supplemental EIS. "We are also concerned that the...lack of detail may not fully meet the requirements of the National Environmental Policy Act (NEPA)....In order to fully comply with NEPA and to fully inform the public of all relevant environmental impacts, we recommend that the FHWA commit to the preparation and publication of a supplemental EIS once all pertinent details become known and prior to final decision-making." Riverkeeper supports the comments of the USFWS regarding the adequacy of the project's NEPA review and the need for a supplemental EIS, particularly since the concerns raised by USFWS and Riverkeeper regarding public participation and the sufficiency of the environmental assessment in the DEIS have not been addressed adequately in the FEIS. (Musegaas and Verleun)

R 3-11: The March 1, 2012, USFWS letter to the National Park Service, which was included as Exhibit 1 of the Riverkeeper letter on the FEIS, was not submitted to FHWA. FHWA only received this letter after it was submitted by Riverkeeper on September 4, 2012. However, portions of the March 1, 2012 letter were incorporated into the March 9, 2012 official submission of comments by the U.S. Department of Interior (DOI) on the DEIS. The March 9, 2012 letter from DOI did not adopt the statements of USFWS regarding the need for an SEIS, and thus, DOI did not make this comment on the DEIS.

Furthermore, the March 9, 2012 letter from DOI states the following: “Prior to this review, the Service [USFWS] provided comments on the preliminary DEIS to the FHWA via electronic mail on December 14, 2011, and which are hereby incorporated by reference. In these comments, we requested additional information on a number of issues and commented on issues of potential concern. Many of these issues have been addressed in the current DEIS, and we commend the FHWA and the joint lead agencies, NYSDOT and NYSTA, for their efforts in addressing them. Nevertheless, we have several outstanding concerns that we recommend be addressed in the FEIS.” The additional comments identified in the March 9, 2012 letter from USFWS were responded to in the FEIS.

C 3-12: Riverkeeper requests that the state withdraw the FEIS and prepare a Supplemental draft EIS that includes a revised alternatives analysis, revised assessment of in-river impacts on endangered Atlantic and shortnose sturgeon, and a complete analysis of the impacts of demolishing the existing bridge. (Musegaas and Verleun, Carlock)

R 3-12: See the responses to Comments 2-1, 3-11, 3-25, 3-27 and 3-28 in Chapter 24 of the FEIS. The FEIS provided further discussion of the impacts of

demolishing the existing bridge (see Chapter 18, "Construction Impacts"), and an SEIS is not necessary.

C 3-13: Demolition of the existing Tappan Zee Bridge constitutes one of the actions that will be undertaken as a direct result of constructing the new bridge. Therefore, the Environmental Impact Statement for this Project must fully consider the impacts of this action. The FEIS's expansion of the DEIS's discussion of demolishing the existing bridge contains very little new information on the actual effects of demolition, though. Most of the additional information found in the FEIS refers to the processes that will be used during demolition, as opposed to the anticipated impacts on the Hudson River and surrounding communities. In addition, the FEIS fails to adequately assess ways to avoid, minimize or mitigate such impacts. In general, the fact that many details that could potentially impact valuable resources are being left to future planning and are not analyzed in the FEIS. Given the significant environmental and community impacts that have not yet been fully investigated or mitigated, Scenic Hudson urges the State to slow down its fast-track process and conduct a Supplemental EIS (Carlock)

R 3-13: The FEIS describes the demolition process and removal of bridge elements, specifying that no blasting would occur during demolition and that silt curtains would be used to minimize sediment resuspension. Design-Build Contract Documents specify that blasting of the existing structure would not be permitted, and that Bridge removal would be required to meet the standards specified in the NYSDOT Bridge Manual, Appendix 17A Bridge Removal, the AASHTO Guide to Design specifications for Bridge Temporary Works, and the NYSDOS/DECA New York State Uniform Fire Prevention and Building Code and its Reference Standards including the Codes of New York State. As described in the NYSDOT Bridge Manual, Appendix 17A, Bridge Removal, a Bridge Removal Plan would be prepared by a Professional Engineer and submitted to NYSTA and NYSDOT.

The FEIS considered the potential impacts associated with bridge demolition activities as described in Chapter 18 as part of the assessment of construction impacts, including separate analyses for water resources and aquatic resources to address construction impacts specific to demolition. The FEIS documents potential impacts of construction activities, including demolition, on the surrounding community (see Chapter 18, "Construction Impacts," of the FEIS).

The evaluation of the potential impacts to water resources and aquatic biota considered the impacts associated with removal of in-water bridge components, and the potential for erosion of sediment that has been deposited in mounds in the vicinity of the existing bridge piers, to affect water quality and aquatic biota. The results of these analyses indicated demolition of the bridge would not result in adverse impacts to water resources or aquatic biota.

C 3-14: From the very start, this process has been less than open. The scope of the project was changed and the Scoping Packet was prepared without public input - only after the scope was changed was the scope subject to comment. The DEIS relied on various documents, such as the Transit Options Alignment Report and May 2011 Cost Estimate, that were not made available to the public during the comment period and were only disclosed two months ago. The FEIS lacks a detailed financial plan that would allow residents to fully understand the state's traffic diversion analysis and possibly identify other consequences of the financial plan that the state may not have considered. Only at the end of July did the state begin making a push to meet with the public to address their concerns in more detail. Despite this effort, the lack of information and accessibility from the issuance of the new NOI in October 2011 through July 2012 critically impacted the public's ability to comment on the project as is desired and required under NEPA. (Vanterpool and Pellecchia)

R 3-14: The public outreach efforts for the Tappan Zee Hudson River Crossing Project have meet or exceeded FHWA and Council on Environmental Quality (CEQ) requirements for a NEPA EIS. The Transit Options Alignment Report was provided to the Tri-State Transportation Campaign by FHWA on March 20, 2012 and the May 2011 Cost Estimate was provided to the Tri-State Transportation Campaign on June 29, 2012. Both documents were posted to the project website on July 6, 2012, prior to publication of the FEIS. It should be noted that the Tri-State Transportation Campaign did not provide comments on either document as part of its formal comment submission on the FEIS.

A-2-4 CHAPTER 4: TRANSPORTATION

C 4-1: In the March 30, 2012 official submission from the Village of Tarrytown concerning the DEIS, the Village noted that the preferred alternative provides for a bike and pedestrian trail on the new crossing; however, the DEIS does not address parking issues associated with access to the new trail. The response to the Village's comment is that this issue will be addressed during the design-build process. It is the position of the Village of Tarrytown that the issue requires an evaluation as part of the environmental review process, since the trail has secondary adverse impacts, namely added traffic and an increased demand for parking that is likely to result from the public's attempts to utilize that amenity. This issue has not been analyzed in the FEIS and it remains the position of the Village of Tarrytown that the environmental review process must address this access issue and provide suitable mitigation for the adverse environmental impacts associated with it. (Fixell)

R 4-1: As described on Page 4-20 of the FEIS, “the proposed shared-use path is anticipated to serve primarily as a transportation use rather than as a destination park. As it would not include recreation amenities such as restrooms, concessions, or parking, its primary users are expected to be visitors from the local communities and recreational bicyclists.”

C 4-2: The analysis of traffic diversion due to toll adjustments should be more clear. Without a concrete toll schedule for 2017 the state cannot full analyze the socioeconomic impacts of this project and the public cannot adequately comment on and FHWA cannot properly review and analyze the socioeconomic impacts of the toll hikes presented in the FEIS. (Vanterpool and Pellecchia)

R 4-2: The exact 2017 toll schedule was not known at the time of the FEIS. However, NYSTA commissioned the diversion analysis based on a worst-case assumption that tolls at the Tappan Zee Bridge would be no higher than tolls at the Port Authority of New York and New Jersey's Hudson River crossings (i.e., George Washington Bridge, Lincoln Tunnel, and Holland Tunnel). NYMTC's Best Practices Model (BPM) was used to test the behavioral characteristics of drivers as a result of this assumed toll schedule, and the results are reported in the FEIS.

C 4-3: The assumptions used for the traffic diversions analysis should be made available. If the state does not make the full 2017 toll schedule and analysis it used available, the public cannot adequately comment on and FHWA cannot properly analyze the FEIS. (Vanterpool and Pellecchia)

R 4-3: Appendix B-7 of the FEIS provides the assumptions for and results of the toll diversion analysis.

C 4-4: A 14 lane bridge (the width of the Delaware Memorial Bridge) is needed. (Winoker)

R 4-4: As described in Chapter 4, "Transportation," of the FEIS, the BPM was used to estimate future travel demand. The BPM projects that the proposed 8-lane replacement bridge will be adequate to meet future traffic demand.

A-2-5 CHAPTER 5: COMMUNITY CHARACTER

C 5-1: In the March 30, 2012 official submission from the Village of Tarrytown concerning the DEIS, the Village made reference to a Village of Tarrytown comment relating to the Scoping Document dated November 3, 2011 requesting that a hard look be provided in the environmental review to alternatives and/or specific actions that would mitigate the substantial negative impacts the project outlined in the scoping packet ("the preferred alternative") will have on the eighty-nine unit Quay Condominiums. The Village noted that the bridge replacement alternative will render the condominium's common elements nearly valueless and that the review must consider measures that will either directly mitigate these effects or enable the private property owners to recover the lost value. The FEIS includes a statement that the Replacement Bridge Alternative is not anticipated to significantly impact the quality of life or property value of The Quay, but there is no documentation to back up this assertion. Based thereon, the Village can only presume that the "hard look" requested by the Village in our response to the Scoping Documents and to the DEIS did not occur. (Fixell)

R 5-1: The DEIS and FEIS examine the short-term (construction period) and long-term (operational) impacts of the Selected Alternative on surrounding land uses, including the Quay Condominiums. The DEIS and FEIS fully document the impacts of the Selected Alternative and mitigation is identified. The DEIS and FEIS also collectively considered effects from changes in traffic, air quality, noise, parklands, historic resources, and visual and aesthetic conditions, and the DEIS and FEIS determined that the Selected Alternative would not result in adverse impacts to community character. As stated in the response to Comment 8-2 below, there is no legal basis for compensation from any diminution in property values.

A-2-6 CHAPTER 6: LAND ACQUISITION, DISPLACEMENT, AND RELOCATION

C 6-1: Why are the permanent easements removed from the property tax rolls in the FEIS? If the fee owner still has access across these easements shouldn't the town assessor have the decision as to whether the easement is tax exempt or should get only a partial percentage off depending on how much the fee owner can use the property? (Vess)

R 6-1: The FEIS provides a conservative analysis that assumes the permanent easements equal a loss of assessed value of that area. However, as noted in the FEIS, the loss of property tax revenue would be subject to final appraisal and acquisition determination, and the ultimate determination of changes in property tax revenues based on the acquisition of real property would be made by local tax assessors.

C 6-2: Is the fee owner of property responsible for the property tax on the land that the easement encumbers or is the easement now considered part of the highway and therefore tax exempt? (Vess)

R 6-2: In the case of a permanent easement, the landowner retains title of the property. The owner of the parcel is responsible for property taxes on the parcel although the tax itself may be adjusted by the tax assessor based on any infringement created by the use of the easement.

C 6-3: Does the fee owner of the property with the easement get refunded any property tax that has already been paid prior to the taking? (Vess)

R 6-3: This is unlikely, but it could happen if the easement occurs within a single tax year for which taxes were already paid and the assessor determines that a lower assessed value is appropriate because of the easement.

C 6-4: After the State takes title to a property in the form of a permanent highway easement and the property is removed from the tax roll, how long does the Town Assessor have to wait before he can put the property with the easement back on the tax roll? (Vess)

R 6-4: In the case of a permanent easement, the landowner retains title of the property. The property is not removed from the tax roll, but there may be a

reduction in property taxes owed on the property, which would be determined by the local tax assessor.

C 6-5: After the State takes title to property in the form of a permanent easement, which gives the fee owner only the right to egress and regress across the easement and the fee owner has no of control of hazardous conditions on the easement, who is responsible if a neighbor gets injured on the state permanent easement? (Vess)

R 6-5: This question cannot be answered generally. Liability would need to be considered on a case by case basis with consideration of all applicable laws and regulations.

A-2-7 CHAPTER 7: PARKLANDS AND RECREATIONAL RESOURCES

C 7-1: NYSTA should include construction of RiverWalk as part of the project. The final EIS does not address this specific proposal. (Buroughs)

R 7-1: See the response to Comment 7-8 in Chapter 24 of the FEIS.

A-2-8 CHAPTER 8: SOCIOECONOMIC CONDITIONS

C 8-1: Although the FEIS document addresses the toll issues for work related travel, the conclusion that there is minimal impact due to the fact that there are not a significant number of low income drivers utilizing the bridge provides an extremely narrow perspective and fails to evaluate the impact on that sector of the population that actually does use the bridge for travel to work. The FEIS document fails to take a hard look at discretionary travel and the impact on tourism and retail activities in Westchester and Rockland Counties. (Fixell)

R 8-1: Chapter 8, “Socioeconomic Conditions,” of the FEIS included an analysis of the social and economic effects of potential toll adjustments. As noted in the chapter, NYSTA prepared a diversion analysis, which assumes toll rates are potentially aligned with the levels of other Hudson River crossings operated by the Port Authority of New York and New Jersey. The analysis revealed only minimal diversion or elimination of trips. As this analysis found minimal diversion or elimination of trips, it is not expected that the potential toll adjustments would result in regional shifts in employment and housing in Rockland or Westchester Counties.

This is consistent with other studies and assessments of the socioeconomic impact of both newly implemented tolling or increases to existing tolls. An assessment of broader issues, such as congestion pricing (toll-ring strategies) or the costs of transportation (such as gasoline pricing) in the United States and in Europe, generally had similar conclusions regarding the relatively small impact on business location decision-making, housing, and workplace choices (see Chapter 8, “Socioeconomic Conditions,” of the FEIS).

In terms of more discretionary travel on the bridge (i.e., personal travel, shopping, and recreation), the FEIS notes that a wide variety of activities and destinations are located throughout the region on both sides of the bridge, and the bridge provides important access for such trip-making. Given that such discretionary trips are more destination oriented (versus the more predominate and frequent convenience shopping which is inherently more localized and the river would be a clear primary trade area boundary), these trips are already taking into consideration a variety of factors of cost (existing tolls, gasoline) and time. Since the region already has a diversity among tolling expenses ranging from the Port Authority crossings, the Tappan Zee, and the Bear Mountain and Newburgh-Beacon Bridges, the potential toll adjustments on the proposed Tappan Zee Hudson River crossing would not be expected to dramatically change discretionary trip-making. This is borne out in the weekday off-peak trip diversion estimates as set forth in the diversion analysis, which shows a level of trip diversion of about 8 percent on a daily basis and a marginal change in daily vehicle miles traveled (VMT). This would be expected to be similar for weekend travel on the bridge.

C 8-2: The FEIS completely dismisses the claims of The Quay in regard to significant diminution of the property values of The Quay as well as those of the individual homeowners, both during and after construction. In this regard, the FEIS conclusions in regard to diminution of property values are wrong both legally and factually. (Sachs)

R 8-2: This claim has not been substantiated. As stated in the response to Comment 8-1 (see Chapter 24 of the FEIS), there is no legal basis for compensation from any diminution in property values.

C 8-3: There is no analysis of the economic impact of the proximity of the new bridge on The Quay and the diminution of the value of the units at The Quay based upon the bridge replacement project. There is also no documentation regarding the fact that the proximity of the bridge directly adjacent to and above the pool and tennis courts renders these amenities virtually valueless other than an acknowledgement in the DEIS that an easement must be obtained for a 0.05 acre piece of vacant land adjacent to these amenities over which the bridge will pass. The description of that easement in the DEIS makes clear that the value ascribed to it is not nearly equivalent to, and simply does not take into account, the adverse environmental impacts the sheer presence of the massive bridge structure will have on the value of these amenities and the FEIS does nothing to rectify this deficiency. The DEIS failed completely to mitigate these negative impacts and the FEIS repeats this failure. The FEIS document also does not assess the economic impact of the proximity of the bridge to the Tappan Landing neighborhood and the Irving neighborhood. (Fixell)

R 8-3: See the above responses to Comments 5-1 and 8-2.

A-2-9 CHAPTER 9: VISUAL AND AESTHETIC RESOURCES

C 9-1: There is a totally inadequate analysis of the obvious visual impacts that the new bridge will have on both The Quay and Salisbury Point. There is no possible mitigation for those impacts. Thus, it becomes a simple issue of fairness that adequate mitigation is provided for the other impacts that will be generated and which can feasibly mitigated. (Parish, Singer, Sachs)

R 9-1: The FEIS contains a detailed visual impacts assessment (see Chapter 9, "Visual and Aesthetic Resources"), which includes vantage points from Salisbury Point Cooperative and the Quay Condominiums. The visual impacts assessment was prepared consistent with FHWA and NYSDOT guidance, and the visual impacts assessment did not identify adverse impacts on the Salisbury Point Cooperative or the Quay Condominiums.

C 9-2: The new Tappan Zee Bridge will serve as gateway to the majestic Hudson Valley from the New York metro area, and as such, having an aesthetically pleasing design is an important feature. The Hudson River is a highly valued scenic resource for residents and visitors alike, and the profound impact the new bridge will have on the viewshed should be taken into account in choosing the bridge design. An aesthetically pleasing bridge could actually improve the views of the River from important nearby receptors; a purely utilitarian bridge designed without aesthetic considerations, on the other hand, could be a great detriment to the aesthetic qualities of the Tappan Zee.

While we appreciate that the Governor will be convening a blue-ribbon panel to evaluate and consider visual aspects of the bridge design and issue recommendations, it is concerning that the Design-Build process requires the contractor to have approximately 30% of the bridge designed in their bid. Once this foundational third of the design is complete, it is unclear what impact the additional input from the blue ribbon panel could have. The chosen design may not be visually sensitive whatsoever, and the recommendations of the panel could end up having the impact of putting lipstick on the proverbial pig.

The design of the new bridge should represent a visual improvement over the current bridge It is integral that stakeholder and community members have meaningful input to the design of the bridge, not merely over paint color or other minor aspects.

R 9-2: Comment noted. (See also the response to Comment 9-1 in Chapter 24 of the FEIS.)

A-2-10 CHAPTER 10: HISTORIC AND CULTURAL RESOURCES

NO COMMENTS RECEIVED.

A-2-11 CHAPTER 11: AIR QUALITY

C 11-1: The State's commitment to create a dedicated bus lane on the bridge will help to reduce mobile source emissions. The FEIS should reflect this benefit to air quality. (Vanderhoef)

R 11-1: Any future assessment of express bus service would need to consider its potential effects on air quality consistent with NEPA and SEQRA requirements.

C 11-2: This increase in the bridge's capacity requires a more detailed air quality analysis. The extra lane provides added capacity which can impact air quality, especially if non-peak volume increases significantly. The state should revisit its position that the lane does not increase capacity and analyze the impacts of this increased capacity on the air quality in the corridor. (Vanterpool and Pellecchia)

R 11-2: The DEIS and FEIS provide a detailed analysis of the air quality effects from operation of the replacement bridge, and the DEIS and FEIS documented, with backup provided in Appendix B, the modeled results that demonstrate no change in off-peak traffic volumes with the addition of a fourth lane on the replacement bridge. These results were also the basis of FHWA's Transportation Conformity Determination for the project, which was issued on August 28, 2012 (see **Attachment C**). Therefore, no additional air quality analysis is warranted.

A-2-12 CHAPTER 12: NOISE AND VIBRATION

C 12-1: The existing noise barrier located adjacent to Van Wart Avenue (south of the toll plaza and New York State Thruway work area) is currently inadequate to address the noise issues in the adjacent neighborhood. (Fixell)

R 12-1: The DEIS and FEIS include a detailed analysis of the potential operational noise impacts of the Selected Alternative based on FHWA and NYSDOT methodologies and procedures. Where impacts have been identified, noise abatement measures are recommended. Please note that as shown in Figure 12-13 of the FEIS, the existing noise barrier along the south side of the Interstate 87/287 right-of-way at the toll plaza would be reconstructed.

C 12-2: To date, the NYSDOT has not addressed the ongoing noise pollution caused by the Tappan Zee Bridge or its proposed Short- and Long-Span alternatives. The FEIS raises the 2010 noise baseline over that reported in the DEIS. The FEIS also raises its estimates of the ongoing noise levels of the Short- and Long-Span alternatives from estimates provided in the DEIS. Refer to the attached chart, "Comparison of Noise Estimates." (Callan)

R 12-2: The FEIS examines impacts of the Selected Alternative design options (i.e., the Short Span Option and the Long Span Option) based on NYSDOT/FHWA impact criteria. As part of that analysis, future noise levels with the Selected Alternative are compared to existing noise levels. Between

preparation of the DEIS and FEIS, a few small corrections were made in the TNM input file that resulted in some small changes that are reflected in the FEIS. Without proposed noise mitigation measures, at the six sites in Westchester County cited, the change in $L_{eq(1)}$ noise levels (i.e., $L_{eq(1)}$ noise levels for the Selected Alternative minus $L_{eq(1)}$ noise levels for existing conditions) would range from 1 dBA to -4 dBA. Consequently, at the six receptor locations cited, the change in noise levels for the Selected Alternative would be imperceptible or negative (i.e., the Replacement Bridge Alternative would result in lower noise levels than existing noise levels) and the proposed noise barriers would further reduce noise levels at these locations. At all locations in Westchester County, noise levels with the Selected Alternative and with proposed noise barriers would not be substantially higher than existing noise levels, and at most locations would be less than existing noise levels.

C 12-3: The NYSDOT does not appear to have a handle on the projected ongoing noise impacts of the 'build' alternatives. No measurements were made of the extent to which noise travels over water and out into the surrounding communities further afield of the bridge landing zones. The NYSDOT's past performance in this regard is cause for concern. (Callan)

R 12-3: Existing and future noise levels were calculated using the TNM 2.5 model, which was validated by comparing measured noise level data in the study area with model predicted noise levels. The TNM 2.5 model validation was performed using land-based noise level measurements from traffic on the existing bridge travelling over water (i.e., the Hudson River) to receptor locations in Westchester and Rockland Counties. The TNM 2.5 model is an FHWA approved model that has widely been used for similar transportation projects throughout the country.

C 12-4: The recent re-decking solution has significantly increased the level of ongoing noise and that came as a surprise to NYSDOT and others. Best practices were not explored. (Callan)

R 12-4: Effects of the re-decking referred to by this commenter are not part of the Tappan Zee Hudson River Crossing Project.

C 12-5: The NYSDOT may accomplish a goal of restoring ongoing noise to pre-2005 levels by, for example: considering a smaller, less expensive bridge; a single bridge with mass transit; a tunnel; or, more informed selection of surface materials. (Callan)

R 12-5: Comment noted.

C 12-6: Response to comment R 12-30 stated that at Salisbury "the terraces are windowed areas and not typical receptor locations". It should be noted that six of the terraces are not enclosed in any way. In addition, the vast majority of the "windowed" terraces are unheated, un-airconditioned, and separated from the living area by a sliding glass door, so they really function as an outside porch. (Crossan)

R 12-6: See the response to Comment 12-30 in the FEIS. It states that "with this [proposed] noise barrier, noise levels at most, if not all, locations in the Salisbury Point Cooperative complex with the Replacement Bridge Alternative would be lower than existing noise levels."

C 12-7: None the less the FEIS did add Wall 3, which mitigates noise at ground level receptors at Salisbury. There is a discussion on page 12-20 that discusses the noise reductions at various floors at Salisbury. However, the discussion is not complete in that it does not compare existing and proposed noise levels and is not specific to each build and each building face. Nor does it discuss the additional benefits and costs of constructing a taller wall. These details need to be addressed in a SEIS. (Crossan)

R 12-7: The information provided in the FEIS with regard to this issue satisfies all regulatory requirements (see response to Comment 12-30 and pages 12-19 and 12-20 of the FEIS). There is no need to perform additional analyses of taller noise barriers. (As the height of a barrier increases, the costs increase substantially. In addition, since the proposed noise barriers break the line-of-sight between the source and receptors, in this case no substantial increase in benefits would be anticipated with a taller barrier.) Accordingly, there is no need for an SEIS to address this issue.

C 12-8: Response to Comment R 12-26 states: "If design studies indicate that reflected noise is a concern, in accordance with NYSTA and NYSDOT practice, barriers with absorptive properties will be recommended."

- What is meant by design studies?
- Who does them?
- When in the process?
- Why could such a study not have been done as part of the FEIS?
- Will public review and comment on the design studies be permitted? If not, why not? If so, how will public comment be incorporated?
- What is NYSTA and NYSDOT practice? Is in a formal memo that can be shared, or is it an informal practice? (Crossan)

R 12-8: As part of the Design-Build Contract Documents, detailed design studies will be prepared to examine noise barrier alternatives. These detailed studies will examine in more specificity the heights, materials, lengths, and design of the proposed noise barriers. The results of these studies will be presented for public review. Public review and comment will be solicited, and comments regarding the location and design of barriers will be considered. This process is consistent with NYSTA and NYSDOT noise policies (see Section 4.4.18.5.4 of the NYSTA and NYSDOT noise policies).

A-2-13 CHAPTER 13: ENERGY AND CLIMATE CHANGE

NO COMMENTS RECEIVED.

A-2-14 CHAPTER 14: TOPOGRAPHY, GEOLOGY, AND SOILS

NO COMMENTS RECEIVED.

A-2-15 CHAPTER 15: WATER RESOURCES

NO COMMENTS RECEIVED.

A-2-16 CHAPTER 16: ECOLOGY

C 16-1: The FEIS is insufficient because there is an inadequate assessment of impacts to endangered species and aquatic ecology. The FEIS also does not remedy the DEIS' failure to fully consider avoidance of such impacts, and mitigation measures to address unavoidable impacts. (Musegaas and Verleun)

R 16-1: The claim that there is an inadequate assessment of impacts to endangered species is without merit. The Biological Assessment, NMFS Biological Opinion (BO), the Essential Fish Habitat Assessment, the Incidental Take Permit application, and the FEIS all provided extensive documentation on life history and ecology of sturgeon in the Hudson River as well as a comprehensive assessment of project impacts on shortnose and Atlantic sturgeon. All of these documents arrived at a similar conclusion, i.e. that project activities would not result in jeopardizing either species of sturgeon. Furthermore, project related impacts to aquatic species and habitat, whether temporary or permanent will be mitigated through permit conditions, EPCs, and Reasonable and Prudent Measures for protection of sturgeon mandated by NMFS in the BO.

A-2-17 CHAPTER 17: HAZARDOUS WASTE AND CONTAMINATED MATERIALS

NO COMMENTS RECEIVED.

A-2-18 CHAPTER 18: CONSTRUCTION IMPACTS

A-2-18-1 COMMUNITY CHARACTER

C 18-1: The Pile Installation Demonstration Program had noise and vibrations impacts on the Ichabod Condominiums in Sleepy Hollow. Somehow the very last pile was the loudest and noisiest and had to be close to 90 to 100 decibels outside, and inside everything was vibrating and thumping. It would be very helpful if we could set up a meeting with our condo association to discuss the bridge, noise, times of expected work, and staging and parking for the work. (Weiss)

R 18-1: As described in Chapter 18, "Construction Impacts," of the FEIS, increases in noise will be perceptible and substantial at certain locations during daytime hours for about six months during construction of the Selected Alternative. However, the FEIS and Design-Build Contract Documents identify abatement requirements for pile driving during construction of the

Selected Alternative. As described in the FEIS, these abatement measures are expected to reduce noise levels from pile driving by approximately 7 to 15 dBA. The Pile Installation Demonstration Program (PIDP) did not include measures to abate airborne noise (i.e., shrouds, pads, etc.) during the driving of test piles.

As described in the FEIS, construction of the Selected Alternative would not result in significant adverse impacts from vibration.

Plans for construction staging, including location, access, work hours, etc., are the responsibility of the selected Design-Builder, and any necessary permits or approvals for construction staging must be procured by the Design-Builder.

NYSDOT and NYSTA will continue to meet with interested members of the public as the project progresses, including residents of the Ichabod Condominiums.

C 18-2: When the construction phase for the bridge begins, where will the staging areas be located on the Tarrytown side of the river to support the project? Specifically, how will the workers and the equipment be delivered to the worksite on a daily basis? I look for your reply, as there are a number of concerned people in Tarrytown and Sleepy Hollow who could be impacted for the next 5 years on how your team will implement these plans. (Krajeski)

R 18-2: As discussed in Chapter 18, "Construction Impacts," and shown in Figure 18-4 of the FEIS, two potential staging areas were evaluated in Westchester County. While the Design-Build contractor may or may not choose to use these sites, based on their proximity to the project site, available size, surrounding land uses and access to Interstate 87/287, these sites are likely candidates and provide a reasonable scenario to assess the potential impacts that may occur from the operation of a construction staging area. As described in the FEIS, the Westchester Bridge Staging Area (WBSA) would include a temporary platform along the Hudson River shoreline to provide direct access to in-water work sites and allow transfer of personnel and materials to these areas. The Westchester Inland Staging Area (WISA) would be established at the site of the existing NYSTA Maintenance Facility and New York State Police barracks at the bridge approach, which can be accessed directly from Interstate 87/287. To connect these two staging areas, a temporary access road would be developed within the NYSTA right-of-way and along the Metro-North railroad tracks.

C 18-3: In the March 30, 2012 submission from the Village of Tarrytown concerning the DEIS, the Village noted that there was a discussion in the document regarding the Westchester Bridge Staging Area, the Westchester Inland Staging Area and a roadway between the two areas. The DEIS document asserts that the staging areas and the connector road pose no significant adverse environmental impacts and the Village questioned that conclusion. The FEIS document notes that the temporary roadway and the staging areas meet the National Ambient Air Quality Standards (NAAQS), and the

Village must once again note that it is the belief of the Village that it is highly unlikely that the creation of staging areas that presently do not exist will have no significant adverse impacts on the residential neighborhoods in which they are in close proximity, especially in relation to the noise, vibration and air pollution that will be generated by trucks and equipment utilizing the areas and the road. The Village locations that will be adversely impacted are the Irving neighborhood just south of the bridge and the Quay condominiums and the Tappan Landing neighborhood just north of the Quay. (Fixell)

R 18-3: The DEIS and FEIS examined the potential traffic, air quality, noise, and vibration impacts of the Westchester Bridge Staging Area in accordance with applicable federal and state environmental regulations and guidance. The FEIS discusses a wide range of source and site control measures and performance specifications, which NYSTA will require the Design-Build contractor to implement to avoid or minimize adverse noise impacts due to construction.

C 18-4: The communities surrounding the bridge on either side of the River will be greatly impacted not only during construction, but for the life of the bridge, as the new approaches and span designs will change neighborhood character, views and quality of life for many residents. Impacts to the surrounding communities during construction will include traffic congestion and detours, disrupted access to residences, businesses and other facilities, presence of equipment, materials and staging areas near the waterfront, noise and vibrations from construction equipment and vehicles, dust and other airborne pollutants, and removal of or damage to trees, shrubs, grass, etc. Construction would also impact Elizabeth Place Park and an adjacent green space area in the Village of South Nyack. Temporary disruptions to recreational boating in the area of the construction will also occur. (Carlock)

R 18-4: The FEIS documents the potential construction and operational impacts of the Selected Alternative and identifies EPCs and mitigation measures to minimize these impacts to the extent feasible.

C 18-5: The level of noise from the pile-driving demonstration pilot was quite disturbing to many residents of the river villages of Tarrytown, Nyack and South Nyack. The test piles were only driven for a few days' duration; when the actual bridge construction takes place, the noise and vibration will last a far longer period of time and be a much greater disturbance to residence of local communities. In fact, the FEIS itself state that construction activities could create noise levels sufficient to cause community disturbance and interfere with daily activities, despite limiting pile driving to no more than 12 hours a day. Even with the best noise mitigation measures, it is clear that significant disturbance will occur to the surrounding communities during construction. This level of community disturbance clearly warrants significant mitigation measures to ensure residents are compensated for the temporary and permanent loss of enjoyment of their homes and communities. Mitigation projects to compensate for these impacts to communities should include increasing public access to riverfront, undertaking waterfront

planning, shoreline restoration, environmental remediation projects, and improving local transit options. (Carlock)

R 18-5: The FEIS assesses the potential impacts of pile driving and identifies EPCs (i.e., shrouds to reduce pile driver noise, quiet compressors and generators, and use of portable or other noise barriers and/or enclosures) to minimize the potential noise impacts to the extent feasible. The temporary impacts that would occur during construction do not warrant the permanent mitigation measures suggested in this comment. The comment is incorrect with regard to implying that the Selected Alternative would result in long-term adverse noise impacts. As discussed in Chapter 12, "Noise and Vibration," of the FEIS, with the recommended noise barriers, the Selected Alternative would not substantially increase noise levels at any locations and would result in decreased noise levels at many locations. Consequently, the suggested mitigation proposed by the comment is not warranted based upon project impacts.

A-2-18-2 NOISE AND VIBRATION

C 18-6: The following general comments (G-1 through G-39) relate to text in the following document: DB Contract Documents Part 3, Project Requirements, Revision (Addendum No. 10), July 18, 2012.

Exhibit B Item 2. CONSTRUCTION NOISE AND VIBRATION CONTROL from pages B-3-3 and B-3-4 has been reproduced in its entirety in *black italics*. We have **bolded** some of the text for emphasis. (Crossan)

R 18-6: Specific comments related to excerpted text (indicated in italics) from the document referenced above are provided below with responses to each. The numbering of comments and responses in each subsection reference the numbering provided in the comment letter.

*A. **Where practicable and feasible** electric powered equipment rather than diesel powered equipment shall be used.*

C G-1: Who determines what's practicable and feasible?

R G-1: NYSTA.

C G-2: What are the inspection, reporting, and enforcement mechanisms involved with respect to scheduling and frequency?

R G-2: To be determined by NYSTA.

C G-3: Will inspection and compliance reports be posted to the website in a timely fashion? If not, why not?

R G-3: Yes.

*B. Use of impact devices such as jackhammer, pavement breakers and pneumatic tools **shall be limited where practicable and feasible**.*

C G-4: Who determines what's practicable and feasible?

R G-4: NYSTA.

C G-5: What are the inspection, reporting, and enforcement mechanisms involved with respect to scheduling and frequency of equipment use?

R G-5: To be determined by NYSTA.

C G-6: Will inspection and compliance reports be posted to the website in a timely fashion? If not, why not?

R G-6: Yes.

C. Shrouds shall be utilized to limit noise exposure to the levels stated in Table 3-B-2-1.

C G-7: Which of the equipment listed will need shrouds to meet the noise levels?

R G-7: This will be determined by the selected Design-Build contractor. The Design-Build contractor can use path controls (which may include shrouds, barriers, etc.), quiet equipment, or other means to meet specified noise limits in the FEIS. NYSTA will provide oversight and review of the Design-Build contractor specifications to ensure that the commitments are met.

C G-8: What are the inspection, reporting, and enforcement mechanisms involved with respect to scheduling and frequency of equipment use?

R G-8: To be determined by NYSTA.

C G-9: Will inspection and compliance reports be posted to the website in a timely fashion? If not, why not?

R G-9: Yes.

*D. Installation of **appropriate** noise attenuation around construction staging areas, including minimization of backup alarms and other noises.*

C G-10: Who determines what's appropriate?

R G-10: NYSTA will determine what is appropriate.

C G-11: The statement uses the word "around" which seem to imply path controls in the form of a wall, but the examples seem to imply source controls. Please clarify.

R G-11: Path controls will be utilized.

C G-12: What are the inspection, reporting, and enforcement mechanisms involved with respect to scheduling and frequency of equipment use?

R G-12: NYSTA will determine the inspection, report, and enforcement mechanisms involved with respect to scheduling and frequency of equipment use.

C G-13: Will inspection and compliance reports be posted to the website in a timely fashion? If not, why not?

R G-13: Yes.

E. Proper maintenance and service of all equipment used on Site, including Subcontractors' equipment, including installation of mufflers to limit noise.

C G-14: Will there be an inspection program for all new equipment brought to the Site?

R G-14: Yes, equipment will either have to be certified based upon manufacturer specifications or field inspection.

C G-15: If not, how will this provision be enforced?

R G-15: See the above response to Comment G-14.

F. Use of sound attenuating curtains or shrouds on the pile driving hammers to reduce noise exposure to the levels stated in Table 3-B-2-1.

C G-16: How is this different from Item C?

R G-16: The Design-Build contractor may utilize a number of noise attenuation measures to reduce the noise generated by pile drivers to the limits specified in the FEIS. These measures may include shrouds, barriers, pads, pillows, etc.

C G-17: Please clarify that the shroud will enclose all four directions simultaneously. As discussed elsewhere pile driver noise will travel long distances so both shores must be protected simultaneously.

R G-17: Noise attenuation measures for pile drivers will be designed to reduce noise levels in the directions where noise sensitive uses are located.

C G-17(2): How will compliance monitoring be conducted? Ground (or water) level monitoring at 50 feet will not be sufficient. Monitoring must also occur at representative vertical elevations.

R G-17(2): Details of the compliance monitoring program have not yet been determined. However, sufficient monitoring will be required to ensure that the specified noise requirements are met. The comment regarding representative vertical elevations is noted, and where necessary, monitoring will occur to determine compliance with specification requirements. NYSTA will have oversight responsibilities to ensure that the noise levels requirements are met and not exceeded.

*G. Use of movable noise attenuation measures around pumps, trucks, and other noisy equipment when operating in **close proximity** to residential areas.*

C G-18: What does close proximity mean?

R G-18: To be determined by NYSTA.

C G-19: Is this more restrictive than Item C? If so, are there additional performance standards and enforcement mechanisms?

R G-19: Item C refers to shrouds. Item G refers to movable barriers.

I. In addition to the vibration monitoring requirements detailed in Project Requirement 10 – Geotechnics, six noise and vibration monitoring stations that shall continuously record noise and vibration shall be provided by the Design-Builder. These devices shall transmit data to a secure website to be maintained by the Design-Builder and access to the website shall be provided to the Authority or the Authority's designee. Three stations shall be located near the Westchester shoreline and three stations shall be near the Rockland shoreline. The locations of the stations shall be subject to the approval of the Authority, and shall be relocated as directed by the Authority. Faulty stations shall be repaired by the Design-Builder within 48 hours of observing a fault.

C G-20: Will there be public input on the site selection? If not, why not? If so, how and when?

R G-20: NYSTA will solicit public input on the selection of monitoring sites. The timing of this effort will be determined.

C G-21: We presume that the noise monitoring will be conducted to document the general success of construction noise mitigation program to limit noise increases (and impacts) to those increases disclosed in the FEIS. Thus, it will be important to monitor and document pre-construction baseline noise levels for comparison to monitored construction noise levels.

R G-21: Pre-construction baseline monitoring will be performed.

C G-22: Will the monitoring data be posted on the public website? If not, why not? If so, how quickly can the data be posted?

R G-22: Yes, the timing is to be determined.

J. To the maximum extent possible, temporary noise walls shall be provided by the Design-Builder to shield residences from construction staging areas, platforms and construction works. A minimum 11 feet high, temporary noise wall shall be installed between the construction staging areas and platforms and the shorelines, and between the construction staging areas and platforms and the south side of the exit ramp (adjacent to Ferris Lane).

C G-23: What does "to the maximum extent possible" mean? The location and height of the barriers should be presented to the public and feedback obtained as part of the Public Information Program.

R G-23: There may be locations where it is not feasible or practicable to erect temporary noise walls. Where feasible and practical, information regarding this and other measures with respect to construction will be provided as part of the Public Information Program.

C G-24: What studies or modeling has been done to determine what an appropriate height is? Other major highway construction projects (e.g. the Central Artery in Boston) have used higher barriers with cantilevered tops to provide protection for receptors at higher elevations during construction. The following text was in a paper describing the Central Artery construction noise mitigation:

> *If practical, noise barriers should be tall enough to provide noise reduction for the upper-most stories of nearby sensitive receptors, though this may not always be achievable with abutting multi-story buildings. Indeed the limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In these cases, the barrier/curtain system must either be very tall or have some form of roofed enclosure to protect upper-story receptors.*

R G-24: The modeling results shown in the construction noise analysis presented in Chapter 18, "Construction Impacts," of the FEIS for conditions with proposed noise abatement analyses reflect "worst case" conditions and assumed that the Design-Build contractor will utilize a wide variety of feasible and practicable noise abatement measures, including noise barriers and quiet equipment. The noise abatement measures assumed in the analysis are described on pages 18-58 and 18-59 of the FEIS, and the results presented in Table 18-25 and Figures 18-13 and 18-14 of the FEIS are based upon modeling that was performed assuming noise reductions from these noise abatement measures (including the specified noise heights).

C G-25: By saying a minimum 11' high implies that the barrier could or should be higher. Who will evaluate the appropriate height based upon the elevation of adjacent sensitive receptors?

R G-25: The specification of a minimum 11-foot barrier does not imply that the barrier should be higher. Increasing the height of a barrier substantially increases the cost, often with little acoustical benefit. Generally, barriers of somewhere between 8 and 11 feet are cost-effective and acoustically effective (because they break the

line-of-sight between the noise source [construction vehicles] and receptors).

K. All construction equipment, including any at-source noise abatement systems, shall not exceed the maximum noise levels shown in Table 3-B-2-1. See Part 2 DB§107-13 for nighttime noise restrictions. In addition, on Saturday mornings until midday and on Sundays all day, no equipment shall be used that emits noise above 70dBA measured at an offset distance of 50 feet if the work is on land and at the nearest point of the shoreline if the work is in the water.

C G-26: With respect to work on land does this mean that no equipment with a Lmax of 71 dBA(Table 3-B-2-1) of greater can be used during these time periods, including concrete mixer and pump trucks?

R G-26: As stated in K above, "on Saturday mornings until midday and on Sundays all day, no equipment shall be used that emits noise above 70 dBA measured at an offset distance of 50 feet if the work is on land and at the nearest point of the shoreline if the work is in the water." The 70 dBA requirement can be satisfied by using a noise barrier or other noise abatement control measure.

C G-27: With respect to work in or over the water how is this determined? Will the noise monitoring data in Item I be used in any way? If so how?

R G-27: Equipment noise levels will be based upon equipment manufacturer specification and/or field measured data. Item K refers to the noise levels of each piece of equipment. Item I refers to noise monitoring stations, which measure cumulative construction noise. They are not the same.

Monitoring, internal reporting, and management of noise levels by the Design-Builder shall be configured to ensure that:

any exceedance of the maximum permitted noise levels shall be identified by the Design-Builder within 30 minutes of the occurrence; and (ii) the activity causing the exceedance is mitigated within 1 hour of the first occurrence such that the exceedance is not repeated. Any exceedance of the maximum noise limits shall be reported to the Authority's Project Manager within 48 hours, with details of the mitigation adopted. Other than exceedance events, reporting of noise measurements shall be weekly.

C G-28: What noise monitoring other than the six stations in Item I will be required?

R G-28: If NYSTA determines that there is a need for additional noise monitoring, then additional monitoring stations or spot monitoring will be performed. In addition, if there are noise complaints,

additional monitoring may be performed to address the complaints.

C G-29: Will the Authority undertake any independent verification noise monitoring? If not, why not? If so, what are they?

R G-29: NYSTA will be responsible for oversight of the Design-Build contractor, and they will verify that appropriate and adequate noise monitoring is performed. There are no plans at this time to perform independent noise monitoring.

C G-30: Who will establish, and who will review and approve the equipment specific noise monitoring protocols?

R G-30: NYSTA will establish, review, and approve equipment noise monitoring protocols.

C G-31: Will the public or local municipalities be afforded the opportunity to comment on the noise monitoring protocols? If not, why not? If s what will the process be?

R G-31: The public and local municipalities will be afforded the opportunity to comment on the noise monitoring protocols through the Public Information Program.

C G-32: Will the professionals hired by interested parties be provided access for verification noise monitoring should conflicts arise? If not, why not?

R G-32: Professionals hired by interested parties will be provided access to verify noise monitoring should conflicts arise.

C G-33: Will noise measurements and exceedance data be promptly posted on the public website? If not, why not? (Crossan) (G-33)

R G-33: Noise measurements and exceedance data will be promptly posted on the public website.

Table 3-B-2-1 Maximum permitted noise levels from construction equipment Equipment Description - Maximum noise levels Lmax (dBA)(1) states: Pumps 73dBA and Other 70 dBA,

C G-34: The FEIS says 77 dBA for pumps. Which value is correct?

R G-34: The Design-Build contractor will have to meet the specification contained in Table 3-B-2-1.

C G-35: We presume that “Other” includes all other pieces of equipment including, but not limited to: chain saw; concrete saw; grader; grapple; jackhammer; hoe ram; and pneumatic tools. Is that correct?

R G-35: Yes.

(1) A-weighted maximum sound level, measured at a distance of 50 feet from the construction equipment, with the use of relevant at-source noise abatement system controls.

C G-36: Which of these limits can be met by selection of quiet equipment, and which will require shrouds or other enclosures that will require periodic inspection?

R G-36: This will be determined by the Design-Build contractor, with review and oversight by NYSTA.

C G-37: What are the specific measures to reduce impact pile driving noise from 105 dBA to 90 dBA? Please provide a schematic that identifies the major noise generating portions of the pile driving, the location of the shrouds, and the location (horizontal and vertical) of the compliance noise monitoring.

R G-37: The specific measures to be utilized to reduce impact pile driving noise to the specified noise limits will be determined by the Design-Build contractor. NYSTA will provide oversight to ensure that the specified limits are achieved.

C G-38: Have these measures been successfully used elsewhere? If so where? If not what confidence do you have that they will work?

R G-38: With regard to whether the specified noise reductions for pile drivers are achievable, recently, noise levels for a pile driver used for installing heavy steel pilings at the Bowling Green Subway Station in New York City, which measured between 102 and 106 dBA without noise abatement, were reported to be reduced to between 77 and 85 dBA, measured at 25 feet, through the use of noise abatement measures.

C G-39: In the EIS for The San Francisco- Oakland Bay Bridge East Span Replacement (which is currently under construction) CALTRANS made the following statement

Caltrans has already investigated such measures as selecting a quieter pile driver, placing a shroud around the hammer, using portable shielding, sound blankets, and plywood sheets. These measures were found not to work for a variety of reasons, including not being effective, challenges in implementation due to wind conditions and elevation, and cost.

This raises some concerns. Will the Authority allow the Design Build contractor to not meet the noise limits for technological or cost reasons? If so, what will the process be, and will there be an

opportunity for public review and comment before implementation of a change.

R G-39: The Design-Build contractor will be required to meet the specified noise limits. With current technology, the specified noise limits are technologically feasible. The CALTRANS statement referred to in this comment may have been true at the time, but as discussed in the response to Comment G-38 above, recent experience at the Bowling Green Subway Station in New York City showed that the noise attenuation levels specified for this project's construction are achievable.

C 18-7: The following general comments relate to **Exhibit B Item 7. PILE DRIVING MANAGEMENT** on page B-3-9. (Crossan)

R 18-7: Specific comments related to excerpted text (indicated in italics) from the document referenced above are provided below with responses to each. The numbering of each reflects the numbering and order provided in the comment letter.

*D. Limiting the periods of pile driving to no more than 12-hours per day, and **predominantly** within daytime hours (**for example** 7am to 7pm). In rare circumstances, and after notifying the Authority Project Manager, it is possible that piling may extend further than 12 hours depending on the practicality of driving.*

C G-40: We can understand the use of the phrase "predominantly within daytime hours" as it relates to winter and short days (9 hours from sunrise to sunset). However, if applied in the summer time when the days are longer (15 hours from sunrise to sunset) the start time could be before 7am and the end time could be after 7pm. Why can the Authority not just commit to 7am to 7pm?

R G-40: As stated above, pile driving will be limited to no more than 12 hours per day, and predominantly within daytime hours (for example, 7 AM to 7 PM). In general the actual pile driving will occur for less than 12 hours per day. However, some flexibility is needed, and as stated above, there may be circumstances where pile driving may extend beyond the 7 AM to 7 PM time period. This is expected to occur only in unusual circumstances (e.g., equipment malfunction).

C G-41: What is the process that the Authority will use to allow pile driving for more than 12 hours a day? Will there be the opportunity for public input into that process? If not, why not? How will the Authority provide notice to communities (both municipal governments and residents) that they have allowed pile driving for more than 12 hours on a particular day(s)?

R G-41: This is expected to occur only in unusual circumstances, and only with the approval of the NYSTA Project Manager. Consequently,

it is unlikely that there will be time to solicit public input. A process will be developed to provide information to the public (i.e., via the project website or through other means to be determined) on the rare occasions when pile driving occurs beyond the typical 12-hour day (7 AM to 7 PM).

C G-42: What are the schedule, cost and impact factors that the Authority will use in making a determination on such a request? Will complaints or issues relating to 7am to 7pm operations be a factor?

R G-42: NYSTA is committed to limiting pile driving to the hours specified. Pile driving will not be scheduled to occur beyond the specified hours. If there is a need to work beyond the specified hours because of unusual conditions or circumstances, a determination will be made on a case-by-case basis.

C 18-8: The following general comments relate to PIP Section 8: Public Involvement during Design-Build Phase from page A-8-11. (Crossan)

R 18-8: Specific comments related to excerpted text (indicated in italics) from the document referenced above are provided below with responses to each. The numbering of each reflects the numbering and order provided in the comment letter.

i. ***Interim Information Updates for Local Officials –*** *the Authority, in consultation with the Design-Builder, shall provide interested municipal and county elected officials and key agencies with a two weekly update of (1)* ***planned construction activities*** *for the subsequent two-week period, highlighting any potential for noise, dust, safety or other impacts of possible concern to local residents or travelers; (2) any* ***unusual traffic diversions*** *or delays due to planned construction activities; and (3)* ***nighttime or weekend construction activities*** *(e.g. off-hour deliveries).*

C G-43: Why can there not be regular reporting of the ongoing and compliance noise monitoring?

R G-43: There will be regular reporting of the ongoing, compliance noise monitoring.

A summary of any ***unusual or important*** *public comments or concerns submitted in writing, posted on the website or received on the Project's phone hotline would also be provided, along with any planned or completed responses to those comments.*

C G-44: Who makes the decisions as to which are "unusual or important"? This concern is less an issue if all comments and responses would be posted on the public website in a timely fashion.

R G-44: NYSTA.

C G-45: Would not a more transparent way of reporting to track comments by geographically (e.g. Salisbury Point, or the Irving neighborhood) and by technical area (e.g. air quality, or traffic) to provide context? Can this be done? If not, why not?

R G-45: NYSTA will take this comment under advisement and will determine how unusual or important comments and concerns will be tracked.

The Authority shall provide this information to involved municipalities and agencies that indicate an interest in receiving these "municipal e-alerts" on a two-weekly basis and at other times as deemed appropriate. Immediate contact shall also be made with local and county officials in potential affected areas connected with emergency-type events, such as accidents, spills of other events of possible public concern.

j. ***Public Information Response Process –*** *Based on the recommendation included in the selected Design-Builder's proposal and finalized in consultation with the Authority, this process will clearly indicate how it will consider and utilize all forms of stakeholder input, including potential actions in consultation with the Agencies to refine the Project's design or construction activities.*

C G-46: Will the Authority solicit feedback from the public on the Public Involvement Plan before it is adopted? If not, why not?

R G-46: NYSTA will solicit feedback from the public on the Public Involvement Plan before it is adopted.

C 18-9: The following general comments (G-47 to G-53) relate to: DB Contract Documents Part 2, DB Sections 100, General Provisions, Revision (Addendum No. 10), July 18, 2012 (Crossan)

R 18-9: Specific comments related to excerpted text (indicated in italics) from the document referenced above are provided below with responses to each. The numbering of each reflects the numbering and order provided in the comment letter.

Section ***DB 107-13 NOISE ABATEMENT*** *on pages 151 – 152 states:*

In urban or populated rural areas where quiet conditions normally prevail, no equipment that emits noise above 70 DBA measured at an offset distance of 50 feet, if the work is on land, and at the nearest point of the shoreline, if the work is in the water, shall be operated during nighttime hours unless such

Work is otherwise specified in the Contract Documents. The Authority's Project Manager may authorize nighttime Work under special circumstances or emergency conditions.

C G-47: This language is similar to, but not identical to, language in Part 3. Why not make the language identical?

R G-47: Comment noted. There is no substantive difference in the text that would necessitate a change.

C G-48: Does “noise above 70 dBA” mean an Lmax of 70 dBA?

R G-48: It means L_{max} of 70 dBA at 50 feet.

C G-48(2): Nighttime should be defined.

R G-48(2): Nighttime will be defined as between 10 PM and 6 AM.

C G-49: This clause does not address different work hours on the weekend. It should be modified to so address.

R G-49: Section K addresses weekend hours.

C G-48(3): The first part of the statement indicates that work can occur at night if it less than 70 dBA, yet the final sentence states that nighttime work may be authorized. Does that mean that any nighttime work needs to be authorized? Or does it mean that nighttime work over 70 dBA needs to be authorized?)

R G-48(3): Nighttime work will be permitted, subject to applicable nighttime noise restrictions.

Every earlier version of the document also contained the following statement:

> *County or municipal ordinances shall apply if they are more stringent than the requirements of the Contract Documents.*

C G-49(2): Why was this deletion made?

R G-49(2): See response to Comment 18-98 in Chapter 24 of the FEIS.

C G-50: We presume that this sentence has been used in other contract documents in the State. Where else has it stayed in the contract?

R G-50: This is not relevant to this FEIS. See response to Comment G-49(2) above.

C G-51: The deletion of this sentence appears to directly contravene NYSDOT procedures:

> *4.4.18 Noise Analysis Policy and Procedures*
>
> *In some cases there may be local laws or ordinances that govern construction noise levels or hours. New York City has a local law that is quite restrictive in many areas. The Department is not generally subject to local noise control ordinances; nevertheless, the existence of those laws should be investigated during project development and every reasonable effort made to comply with their provisions during construction following the procedures provided above.*

Please comply with NYSDOT procedures. We recommend that the Authority coordinate with each affected municipality with respect to the conditions in their noise ordinances.

R G-51: See the response to Comment 18-98 in Chapter 24 of the FEIS. NYSDOT is not the contracting entity. NYSTA is the contracting entity. NYSTA has held numerous meetings with local governmental entities, and where feasible and practicable, and where it will not significantly affect safety, operations, and construction costs, NYSTA will try to comply with local ordinances. However, one example of local noise ordinances that cannot be complied with, are restrictions on hours of construction.

C G-52: The FEIS Response to Comment 18-98 states:

> *The NYSTA is a state authority and is not required to comply with local codes and regulations. However, it is NYSTA's practice to comply with local codes and regulations where and when compliance would not result in substantial delays, require incurring additional costs, or interfere with achieving project goals.*

This is NOT what the procedures say. There was no discussion of what the various noise codes say in the affected municipalities and how and why the project is deviating from them. The phrase "every reasonable effort" in the procedures certainly seems clear. The Authority and their consultants should have "investigated" the local noise codes during NEPA/SEQRA and assessed their ability to comply.

Compliance with those parts of the noise codes that could be complied with should have been summarized. Specific reasons for non-compliance of other portions should have been documented. Any additional cost, as the response implies, should not a reason for non-compliance. Because of the sensitivity of construction noise as an issue public dialogue on what constitutes "every reasonable effort" should have been part of the NEPA/SEQRA process. This must be addressed in an SEIS.

R G-52: The analysis complies with NEPA and FHWA requirements. Pursuant its enabling legislation, NYSTA is not subject to local noise codes. See the response to Comment 18-11 below, which states the reasons that an SEIS is not needed.

C G-53: Since the FEIS has not properly addressed the "every reasonable effort" issue and the noise mitigation measures are only vaguely defined there are many more details to be finalized. How will this be accomplished moving forward? It will be important for all municipalities and affected residents to have their voices heard.

R G-53: It is not correct that "the FEIS has not properly addressed the 'every reasonable effort' and the noise mitigation measures are only vaguely defined." As part of developing the noise abatement program for this project, a wide range of mitigation measures were considered. The noise abatement program described in the FEIS was the result of considerations of the effectiveness, feasibility, and practicability of a wide variety of source and path control measures. Additional information regarding design, construction, noise mitigation, and other issues will be provided, and community input will be solicited as part of the Public Information Program.

C 18-10: In addition to discussions regarding construction noise in the Design Build Documents there are also discussions in the FEIS on pages 18-58 and 18-59. General comments G-54 to G-73 relate to those pages, the relevant text of which is reproduced below. (Crossan)

R 18-10: Specific comments related to excerpted text (indicated in italics) from the document referenced above are provided below with responses to each. The numbering of each reflects the numbering and order provided in the comment letter.

Two significant noise abatement measures that NYSTA/NYSDOT will implement would be: (1) the use of noise barriers to reduce truck noise along the south and north sides of the ramp leading to River Road in Rockland County and on the south side of the access road leading to the staging area in Westchester County;

C G-54: This commitment includes more construction road noise barriers. See text relating to Comments G-23 to G-25. The Record of Decision/Findings Statement should include all barriers.

R G-54: Comment noted. See response to comments G-23 to G-25.

C G-55: The barriers along construction roads should be installed before the access roads are constructed, and dismantled only after the access roads are demolished.

R G-55: The barriers along construction roads will be constructed in conjunction with the access roads and will be removed when the access roads are no longer in use.

C G-56: The barriers at staging areas should be installed as early in the construction sequence as possible.

R G-56: The barriers at the staging areas will be constructed in conjunction with the staging areas and will be removed when the staging areas are no longer in use.

and (2) the use of quiet equipment and path control measures. Specifically contractors will be required to construct noise barriers at least 8-11 feet high in the areas described above, and around all inland and pier staging areas.

C G-57: The Design Build documents say a minimum of 11 feet. See Comment G-25. We presume that barriers will be a minimum of 11 feet tall. Is that correct?

R G-57: That is correct. The barriers will be a minimum of 11 feet high.

*With regard to the use of quiet equipment and path control measures, **Table 18-24** shows Lmax noise levels at 50 feet for selected typical construction equipment and the Lmax noise levels at 50 feet for the same equipment that contractors would be required to achieve (using quiet equipment and/or path controls [shrouds, barriers, etc.]).*

In addition to the noise barriers and equipment with reduced noise levels specified above NYSTA and NYSDOT are committed to implementing the following generalized source control, site control, and community awareness measures to minimize and reduce potential noise concerns relating to construction activities:

C G-58: These general items are either not mentioned in the Design Build documents or are worded differently. This needs to be clarified.

R G-58: The Design-Build Contract Documents are substantively in conformance with the values in Table 18-24 of the FEIS and the EPCs and other measures identified in the FEIS.

- *Source Control Measures:*

- Use of properly designed and well-maintained mufflers in all internal combustion engines, engine enclosures, and intake silencers;

C G-59: Who will inspect? Who will enforce?

R G-59: NYSTA will have that responsibility.

- Require contractors to perform regular periodic equipment maintenance; and

C G-60: Will contractors be required to have maintenance logs for Authority inspection? If not, how will requirement be met?

R G-60: NYSTA will have an oversight compliance officer who will be responsible for oversight of the contract requirements. The exact procedures regarding how this will be done have not yet been determined.

- Use of new equipment with reduced noise levels where feasible and practicable.

C G-61: Is this requirement any more restrictive (i.e. protective of the residents) that Table 18-24?

R G-61: Table 18-24 sets the maximum allowable noise levels. Where feasible and practicable, new equipment with reduced or lower noise levels will be utilized.

- *Site Control Measures:*

- Place stationary equipment as far away as feasible and practicable from sensitive receptor locations;

C G-62: Who determines what is feasible and practicable?

R G-62: NYSTA.

C G-63: Will the Authority inspect equipment locations and require changes if necessary?

R G-63: NYSTA will inspect equipment locations and require changes, if necessary.

- Strategically select waste disposal sites to minimize potential noise concerns;

C G-64: Will the Authority approve waste disposal sites?

R G-64: The Design-Build contractor will be required to demonstrate compliance with applicable laws and regulations to NYSTA.

C G-65: Will the Authority inspect waste disposal sites and require changes if necessary?

R G-65: NYSTA will be responsible for overseeing that the Design-Build contractor's adherence to contract requirements and all applicable laws and regulations with regard to waste disposal.

- Where feasible, coordinate work operations to coincide with time periods when people would be least likely to be affected by construction-related noise;

C G-66: Who determines what is feasible?

R G-66: NYSTA.

C G-67: What time periods would people be least likely to be affected by construction noise?

R G-67: As is standard practice for any construction project, daytime hours are considered the period during which people would least likely be affected by construction noise. While daytime construction activities could disturb people near the construction site, it is typically considered less disruptive than construction activities during nighttime hours. As discussed in Chapter 18,

"Construction Impacts," of the FEIS, during nighttime hours (i.e., 10 PM to 6 AM) construction activities can occur, but they are subject to strict noise restrictions. The most noise intensive activity, pile driving, would only be allowed from 7 AM to 7 PM. In rare circumstances, it is possible that pile driving may extend beyond the 12 hours specified above depending upon the practicality of completing work begun that day.

- Where feasible eliminate nighttime operations (in particular no pile driving will be scheduled for nighttime, Saturday morning and all day Sunday);

C G-68: The commitment is vague and inconstant with the Design Build documents. Please clarify.

R G-68: Comment noted. See responses to Comments G-40 and G-48(3).

- Eliminate "tail gate banging";

C G-69: How will this be done?

R G-69: It will be determined by the Design-Build contractor, with NYSTA oversight.

C G-70: Who will inspect?

R G-70: NYSTA will have that responsibility.

- Reduce backing-up procedures for equipment with backup alarms, and replace backup alarms with strobes where acceptable per Occupational Safety and Health Administration (OSHA) and other regulations; and

C G-71: How will back-up procedures be reduced?

R G-71: It will be determined by the Design-Build contractor, with NYSTA oversight.

C G-72: There are also variable loudness back-up beepers that meet OSHA requirements. Alternate (i.e. quieter than standard) backup beepers should be required on all equipment. If not, why not?

R G-72: Where appropriate, backup beepers that are quieter than standard beepers will be utilized on construction-related equipment.

- Where feasible, prior to construction operations commencing, construct noise barriers described in Chapter 12 to mitigate post construction conditions.

- *Community Awareness Measures:*

- Notify the public of construction activities that may be perceived of as noisy and intrusive prior to starting construction; and

- Establish means for the public to contact the engineer-in-charge (i.e., provide telephone number, email, etc.) and methods to handle complaints.

- Implement a noise and vibration monitoring program.

C G-73: Many other items should be posted on the public website including, but limited to: (1) on-going noise monitoring data; (2) noise mitigation compliance reports; and (3) complaints and responses. The responses should be clear as to how individual complaints are addressed.

R G-73: Comment noted. Where appropriate, additional items will be posted on the project website.

C 18-11: Numerous commenters on the DEIS raised the issue that a SEIS needed to be prepared and not a FEIS. Part of Response R 3-18 states:

> *Partly in response to comments made with respect to the claimed need for an SDEIS, FHWA prepared a Re-evaluation to assess whether, after the completion of the DEIS, there were any changes to the proposed action or new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts that would result in significant environmental impacts not evaluated in the DEIS. The Re-evaluation, which appears in Appendix A to this FEIS, reflects the agency's determination that an SDEIS was not required.*

This Re-evaluation (Appendix A-7) is a 607 page document with no table of contents to permit an easy review. In scanning every page we concluded that NONE of the SEIS points raised in the comments on the DEIS by anyone had been addressed. Thus, the claim that there is a link between the comments on the DEIS and the Reevaluation is unsupported by the available information. The issue of the need for a SEIS should have been discussed globally in the Re-evaluation rather than piecemeal in Responses to Comments. The piecemeal response allowed comments to be restated with important issues missing, and to be addressed separately and narrowly, rather than in a large comprehensive way. (Crossan)

R 18-11: The Re-evaluation Statement is an 11-page document with supporting exhibits (see Appendix A-7 of the FEIS). The exhibits are clearly listed on the first page following the text of the Re-evaluation Statement. All comments on the DEIS that raised the issue that a Supplemental DEIS (SDEIS) needed to be prepared were answered in Chapter 24 of the FEIS (see responses to Comments 3-18 through 3-28 in the FEIS). Among other issues, the Re-evaluation Statement examined the new information provided by the results of the Pile Installation Demonstration Program (PIDP), the results of the toll diversion study (project financing based on toll revenue bonds), and the NMFS Biological Opinion. All of these were issues raised by commenters on the DEIS.

C 18-12: We and others had raised issues about incorporating the results of the PIDP in the SEIS (or in this case the FEIS). Fisheries work relating to noise and

other issues was summarized in a 181 page technical appendix (Appendix F). The only report on ambient noise monitoring was to say that the impact pile driver was 106 dBA at 50 feet. There was no discussion of any important details, for example, methodology, location and height of monitoring, monitoring at multiple distances, how many occasions the monitoring was conducted, or whether attenuation rates over the water varied. This information is crucial to the conclusions in the FEIS should be provided. The impact pile driver is the noisiest piece of equipment by far and is the controlling factor as far as peak noise levels. (Crossan)

R 18-12: The technical ambient noise monitoring details cited in this comment were and are available, and in many cases, were provided or cited in the FEIS. The Re-evaluation Statement specifically examined the results of ambient noise monitoring collected on the Rockland and Westchester shorelines as part of the PIDP and concluded that it was not necessary to prepare an SDEIS based on those results.

C 18-13: We had raised the issue that L10 and Lmax should also have been addressed (Comment 18-96). The response, R 18-96, misses the point. The Leq descriptor, which was used in the DEIS and FEIS, may indeed be the single most utilized descriptor, but it is not the only important or relevant descriptor. It is the easiest to calculate because of RCNM. However, Lmax, which is indicative of how loud the loudest, most intrusive and disruptive noises are, is also easy to calculate. Presentation and discussion of Lmax levels would have assisted the reader in understanding exactly how intrusive the construction activities would be in their daily lives. It will likely be the peak noises (Lmax) that generate the most complaints from the adjacent residences. Because of that the Lmax levels that correspond to the modeled Leq values should be calculated and disclosed. In this way monitored Lma values can also be used to document the success of the noise mitigation program.

L10 is also an important descriptor in that at 45 dBA L10 is a commonly used interior standard, which is used in New York City (Crossan)

R 18-13: The response to Comment 18-96 in Chapter 24 of the FEIS addressed this issue. The $L_{eq(1)}$ is an appropriate noise descriptor for evaluating project impacts. The use of other noise descriptors, such as L_{max} or L_{10}, is not necessary in order to assess project impacts or comply with applicable environmental review requirements.

C 18-14: An important aspect of an EIS is to “bound” the potential impacts. Bounding means to describe and disclose the worst case impacts. With noise that is related to maximum loudness and duration. The FEIS discusses worst case impacts (for a period of up to 6 months), but does not duration further. For example the NYC CEQR Technical Manual defines construction impacts of less than two years as short term and greater than two years as long term. The FEIS did not address the noise increases that would exist throughout the long term construction. For example, Table 18-25 reports a maximum

increase in Leq of 10 dBA at 5 Edgewater Lane. This is described as a unmitigated noise impact that could occur for up to 6 months. The FEIS is silent on what happens beyond 6 months. We can only assume, therefore, that at all locations noise increases will be 3 dBA or less except for one six month period. Any increases more than 3 dBA outside the 6 month window are not analyzed or disclosed in the FEIS, and therefore not covered by the bounding. Any unmitigated noise impacts longer than 6 months would require additional mitigation and analysis in a Supplemental EIS. (Crossan)

R 18-14: The construction noise analysis that was presented in the FEIS assumed a worst-case condition in which three (3) pile drivers were operating simultaneously in close proximity to sensitive receptor locations along the Hudson River in both Westchester and Rockland Counties. This worst-case condition is extremely unlikely to occur, and for safety reasons, the pile drivers and other equipment would be expected to be spread out over a larger area, with 2 of the pile drivers further from shore. This would be expected to result in lower noise levels than those presented in Table 18-25 and Figures 18-13 and 18-14 of the FEIS. In addition, as discussed in the FEIS, after the approximately 6-month time period when pile driving would be expected to occur at near-shore locations and during most of the time construction operations are occurring, pile driving will take place farther off-shore and noise levels would be less than those shown in the table and figures cited above. As discussed in the FEIS on page 18-61, there are no additional noise abatement measures that are feasible and practicable that could be implemented to reduce noise levels at location where worst-case noise level increases are predicted to be above 6 dBA (Sites 2, 3, 5, 6, 7, and 9). The New York City Environmental Quality Review (CEQR) Technical Manual noise criteria have no relevance for this project. Consequently, there is no need for any additional construction noise analysis or SEIS since a worst-case condition has been analyzed and a commitment has been made to implement all feasible and practicable mitigation measures.

C 18-15: The issue of inadequate baseline noise monitoring raises additional issues. It is reported on page 18-61 of the FEIS that:

> *Construction-related activities would be expected to produce noise levels at these five receptor sites (Sites 2, 3, 5, 6, and 7), and **at locations near these receptor sites**, which would be intrusive and noisy, and result in unmitigated noise impacts.*

Site # 2, which is somewhere on Thruway property between The Quay and the Thruway, has a maximum noise increase of 10 dBA. Site # 1, which is somewhere in the Tappan Landing development, has a maximum increase of 3 dBA, which is barely perceptible and not an unmitigated impact. The Quay lies between these two receptors. Can those residents expect increases of 3 dBA, which would not be an impact, or can they expect increases of 10 dBA which would be an impact? (Crossan)

R 18-15: Figure 18-14 of the FEIS shows $L_{eq(1)}$ noise contours. These contours allow the reader to estimate worst-case noise levels from construction. Worst-case noise levels at the Quay Condominiums due to construction would be expected to be less than at Site 2. The increase in noise levels at the Quay Condominiums would be expected to be above 6 dBA.

C 18-16: If The Quay or Salisbury, for example, wanted to independently verify during construction that the mitigation measures were working as represented in the FEIS there are no accepted (by the Authority) baseline values in the Quay or Salisbury to which to compare. In fact, no independent observer could do monitoring at any of the sites because we do not know the location at which the measurements were taken and the modeling performed. (Crossan)

R 18-16: The locations of noise measurements and modeling have been reported in the FEIS. Moreover, the location of the noise (and vibration) monitoring stations that the Design-Build contractor will provide have not been selected. Baseline measurements prior to the start of construction, as well as continuous measurements during construction, will be made at these stations. One or more of these monitoring stations may be located at the Quay Condominiums and Salisbury Point Cooperative. See responses to Comments G-20 to G-22 above.

C 18-17: In fact, if the Authority were to attempt to do noise monitoring during construction in response to complaints there is not sufficient baseline noise monitoring. The noise and vibration monitoring at the 6 sites (3 in Westchester County and 3 in Rockland County) discussed in the Design Build Contract (see Comments G-20 to G-22) could partially solve this problem if noise monitoring were to start prior to construction. Will that be required to occur? (Crossan)

R 18-17: Noise monitoring will be performed at the noise monitoring stations prior to the start of construction to obtain baseline noise levels.

C 18-18: Even if it does occur at those 6 sites how will the Authority respond to complaints from residents not adjacent to those 6 monitoring locations? (Crossan)

R 18-18: NYSTA will examine any complaints received from residents, and where necessary and appropriate, take measures to resolve these complaints.

C 18-19: It would seem appropriate for the Authority, in consultation with the affected municipalities, to establish a more comprehensive set of baseline monitoring data to which future compliance is compared. More detailed examples of the lack of sufficient site specific baseline noise monitoring is presented in both the Tarrytown and Salisbury comments. We recommend that the Authority and interested parties agree to monitoring protocols that could be followed by any interested party to confirm that mitigation measures are being implemented and mitigate noise levels as represented in the FEIS. (Crossan)

R 18-19: NYSTA believes that the proposed noise abatement program and enforcement measures are adequate to minimize potential construction-related noise impacts. NYSTA will continue its public outreach initiatives and will maintain an open line of communication to address concerns of area residents.

C 18-20: If compliance noise monitoring at 50' is within the limits specified, but the ambient monitoring shows unmitigated impacts that are greater in intensity or duration than disclosed in the FEIS, what will the Authority's response be? Enhanced mitigation? A Supplemental EIS? How quickly will the response be implemented? (Crossan)

R 18-20: If equipment is in compliance with specified noise limits and there are noise complaints, NYSTA, along with the Design-Build contractor, will examine whether there are feasible and practicable additional measures that could be implemented to reduce or eliminate the noise concerns. Complaints will be examined as soon as feasible and corrective action will be taken as necessary.

C 18-21: We previously commented that Cadna/A would have been a more appropriate construction noise model than RCNM (Comment C 18-92). The response was:

> *The RCNM 1.1 model used for the construction noise analysis is the model recommended and approved by FHWA and NYSDOT for this type of analysis. The Cadna A model is not a model that has been approved by FHWA and NYSDOT for this use.*

The response is not totally correct. Yes RCNM 1.1 is used and approved by FHWA and NYSDOT, but it not exclusive. As per FHWA's Construction Noise Handbook:

> *More recently there have been very sophisticated noise prediction model programs commercially available such as SoundPLAN (by SoundPLAN LLC of Shelton, WA**), Cadna/A** (by DataKustik of Munich, Germany), and the Environmental Noise Model (ENM by RTA Technology of Australia). These programs are able to display the predicted noise levels in formats that **provide much more information**, when compared to spreadsheet models, by **graphically displaying results as equivalent noise contour lines**. In doing so, noise levels at any receptor location of interest can quickly be estimated by interpolating the results between adjacent noise contour lines. Moreover, the construction equipment types and working locations can be changed fairly easily in these models, and new noise results can be computed much more quickly than could be done with discrete receptor point models. These sophisticated models also allow for some evaluation of noise reduction effects from various mitigation measures and/or man-made or natural barriers.*

There is a clear acknowledgement by FHWA that Cadna/A is a more sophisticated model for use in more complex environments. In fact, we

question whether Figures 18-13 and 18-14 in the FEIS were developed with Cadna/A. Since RCNM 1.1 could not have been used to generate the contours to develop those figures, the model, methodology, assumptions and input parameters should be disclosed and discussed in a SEIS. (Crossan)

R 18-21: The response to Comment 18-92 in Chapter 24 of the FEIS, which is quoted above, is correct. The FHWA Construction Noise Handbook recognizes that there are other noise prediction models available such as SoundPLAN, Cadna/A, and ENM, and that these models are able to graphically display results. However, the RCNM is the recommended computerized construction model, and none of the other cited models are FHWA recommended models.

The commenter is incorrect in saying that "there is a clear acknowledgement by FHWA that Cadna/A is a more sophisticated model for use in more complex environments." In addition, the commenter is incorrect in saying that the RCNM could not have been used to generate the contours in Figure 18-13 and 18-14. The RCNM model was used to calculate noise levels at grid point locations, and the noise contours were developed based upon those results.

C 18-22: There were several comments on the DEIS on the enhanced transmission of sound over water and at multiple meetings with the Authority. The response that the models account for that is not correct.

A recent (2010) noise study by DOE reported that modeled noise levels at a distance of4.83 km (3.0 mi) modeled over water are 16 dBA higher than modeled at that distance over land. The explanation in the report is quoted as follows:

> *The noise level calculated using the Swedish overwater model is much larger than that calculated with the two land-based models. This is due to the manner in which the model treats the geometric divergence of the acoustic signal. While both land models assume spherical wave spreading throughout the entire region, the Swedish overwater model assumes spherical wave spreading for the first 200 m and then transitions to cylindrical spreading. For spherical wave spreading the sound pressure levels decrease 6 dB with every doubling in distance, while with cylindrical spreading there is a 3 dB reduction with every doubling in distance.*

The approximate width of the Hudson River at the crossing is 3 mi. This means that pile driving on the Westchester side of the river will be about 16 dBA louder on the Rockland side than the FEIS acknowledges. This also means that pile driving in the center of the River would be about 11 dBA higher on both shores than the FEIS represents in its modeling. Thus, the potential for unmitigated noise impacts extending for greater than 6 months is great and must be addressed. This supports the reasonableness and

need for receptor controls to mitigate construction and operation noise. (Crossan)

R 18-22: The cited report compares modeling results obtained using three modeling approaches, a Swedish overwater model approach and two land modeling approaches. Both the Swedish overwater approach and the two land modeling approaches assumed that sound pressure levels decreased by 6 dB for every doubling of distance the first 200 meters (approximately 656 feet). After 200 meters the Swedish model assumed that the sound pressure level decreased by 3 dB for every doubling of distance, but the land based models assumed the larger decrease for every doubling of distance. No comparison was made of the accuracy of the drop off assumption. The report concluded that all three models showed that noise from the proposed turbines would be less than the applicable standards.

For the analysis in the FEIS, it was assumed that three pile drivers were operating simultaneously closer than 250 feet off-shore. The drop-off rate with distance used in the analysis was as specified in the RCNM. At this short distance, the drop-off rate assumed in the RCNM would be the same as that of the Swedish overwater model. In addition, noise effects due to pile driving at locations in the middle of the Hudson River or effects from pile driving across the Hudson River because of the large distances involved would be substantially less than the near-shore noise level effects analyzed and presented in the FEIS.

C 18-23: We raised the issue of receptor controls (Comment C 18-101). The Response (R18-101) stated:

> *It is not FHWA and NYSDOT policy to fund receptor abatement measures (i.e., building envelope improvements, such as soundproofing or the installation of better quality windows to reduce noise impacts for residents), and NYSTA has no plans to install a bubble over the pool for noise abatement.*

To say that it is not FHWA policy to fund receptor abatement measures is confusing at best and wrong at worst. It is FHWA's Construction Noise Handbook (2006) that specifically discusses receptor noise abatement measures. Also, other FHWA projects (e.g. the Boston Central Artery) have included receptor noise abatement measures such as replacement windows.

A direct quote from **Construction noise control program and mitigation strategy at the Central Artery/Tunnel Project** (Received 1999 December 15; revised 2000 July 21; accepted 2000 August 04) Erich Thalheimer, states: *Acoustical window treatments to improve the noise reduction qualities of residential window openings represents a proven successful means to implement receptor noise control. In general, window openings are the weak link in a structure's external facade allowing noise infiltration into the building. When properly specified and installed, window treatments can provide for a significantly quieter interior noise environment, particularly in*

multi-story buildings with upperfloors that may not benefit from typical noise barriers.

Because (1) construction noise impacts have been understated in duration and (2) difficulties with respect to compliance monitoring and enforcement, there must be consideration of receptor controls as an appropriate means of noise mitigation. (Crossan)

R 18-23: The response to Comment 18-101 in Chapter 24 of the FEIS is correct. Existing regulations do not allow funding for receptor noise insulation for private residences. Further, the impacts of construction noise are fully analyzed and EPCs will be implemented to reduce noise levels to the extent feasible and practicable during construction.

C 18-24: It is insufficient and inadequate to say that it is not NYSDOT to fund receptor abatement measures. Policies are developed on the basis of past practice and must be re-evaluated as new information becomes available. It was likely Massachusetts DPW's old policy not to fund receptor abatement, as construction was started on the Central Artery without such a program. The policy was obviously amended to permit it, and it was successfully incorporated into the project. NYSDOT should re-evaluate their policy. (Crossan)

R 18-24: See response to Comment 18-23.

C 18-25: A very important question, to which we did not see answered in the Design Build documents, or explained in the FEIS is: what are the consequences to the contractor of non-compliance with the noise mitigation plan?

The FHWA Construction Noise Handbook speaks to this point in Section 7.8:

> *On those projects where construction noise impacts require a significant level of physical and operational mitigation, the ability to successfully monitor construction noise is closely tied to the commitment to meet the requirements detailed in the contract specifications and special provisions. To be able to successfully enforce any project's construction noise requirements, it is essential that the project's specifications and special provisions embody the following:*
>
> - *Empowerment of staff;*
> - *Clearly defined consequences; and*
> - *Dispute resolution mechanism.*

We believe that these points should be explicitly addressed in the contract documents. (Crossan)

R 18-25: If non-compliance occurs, the Design-Build contractor will be directed to take remedial action to come into compliance with contract specifications and requirements. NYSTA is committed to taking whatever actions are

necessary to achieve compliance with the contract specifications and requirements.

C 18-26: Another recommendation in the FHWA Construction Noise Handbook, Section 7.3.4 is:

> *Another technique worthy of consideration involves the inclusion of incentives and/or disincentives in the contract specifications to encourage contractors to participate in the mitigation program and to make the contractors more accountable for impacts.*

Can incentives and disincentives be included in the contract? If not, why not? (Crossan)

R 18-26: Yes, they can be included.

C 18-27: There are no noise monitoring sites in Salisbury. There are two adjacent sites, Site 5, a residential property to the north, and Site 6, on NYS Thruway Authority immediately adjacent to the Thruway. Site 5 is projected to have a maximum construction noise increase of 5-10 dBA, which is a significant adverse impact that could occur for up to six months. Site 6 is projected to have a maximum construction noise increase of 5-9 dBA, which is a significant adverse impact that could occur for up to six months. However, neither of these sites are at all representative of the either the existing conditions at Salisbury, or the potential exposure to construction noise impacts. This deficiency was pointed out in our comments on the DEIS, but was rectified in the FEIS. (Crossan)

R 18-27: See the response to Comment 18-76 in Chapter 24 of the FEIS. Figure 18-13 of the FEIS shows $L_{eq(1)}$ noise contours for worst-case construction conditions in Rockland County adjacent to the project site. The Salisbury Point Cooperative is included in the area shown in the contours. The contours allow the reader to estimate noise levels due to construction. The increase in noise levels at the Salisbury Point Cooperative for worst-case construction conditions would be expected to be as high as approximately 9 dBA.

C 18-28: One important aspect that the FEIS has not acknowledged in the construction noise analysis is the fact that the different floors, different buildings and different facades at Salisbury will be exposed to different construction noise impacts. With respect to different floors, it is a well documented fact that the various path controls are less effective when the receptors are a higher elevation. For example, Chapter 12 of the FEIS on page 12-20 discusses the reductions at Salisbury due to the new Wall 3. The reductions will be 7 dBA or more at the ground floor, 6 dBA at the 4th floor and only 1-4 dBA at the 7th floor. We expect that similar effects would be observed with construction noise. This needs to be further analyzed in a Supplemental EIS. (Crossan)

R 18-28: Page 12-20 of the FEIS discusses the effectiveness of proposed Bridge path controls (i.e. sound barriers) and concludes that at the Salisbury Point Cooperative path controls would be about 1-3 dBA less effective at the 4th floor, and 3-6 dBA less effective at the 7th floor, compared to ground level. For construction mitigation, a combination of source and path controls are proposed. While there may be some reduction in the effectiveness of path controls at elevated receptor locations, depending upon the type of path controls and placement of the path controls, the reduction in effectiveness at elevated receptor locations may be less than the values discussed on page 12-20 of the FEIS, which pertain to Bridge sound barriers. Source control measures would not have any reduction in effectiveness at elevated locations. Lastly, in general, pile drivers are the major noise source during construction, and while, at this time it is not known exactly what control measures will be used to reduce pile driver noise levels, it is likely that the effectiveness of the measures utilized (for reducing pile driver noise levels) will not be substantially less at elevated locations.

No SEIS is required in relation to the issue raised by this comment. As provided by FHWA regulations, 23 CFR 771.130:

(a) A draft EIS, final EIS, or supplemental EIS may be supplemented at any time. An EIS shall be supplemented whenever the Administration determines that:

1. Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or

2. New information or circumstances relevant to environmental concerns and bearings on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.

This comment does not identify changes to the proposed action, new information or new circumstances that would result in significant environmental impacts not evaluated in the EIS.

C 18-29: The FEIS does not discuss the different buildings and facades at Salisbury and the different noise environments present. Two of the four buildings have two facades that face the Thruway. They are approximately 300' from the Thruway now, and 200' in the future. The other two buildings are approximately 500' from the Thruway now, and 400' in the future, and are partially shielded by the two intervening buildings. The facades that face the river (and the Rockland staging area, and pile driving will be subject to the greatest construction noise, while the facades facing the Thruway have the highest existing noise levels. The understanding of noise levels at various units throughout all 4 buildings and 7 floors is crucial to any construction and operation noise impact and mitigation assessment. This must be included in the SEIS. (Crossan)

R 18-29: The FEIS adequately assesses potential construction and operational noise impacts and provides commitments to provide feasible and practicable mitigation at locations where adverse impacts are predicted to occur. Figure

18-13 in the FEIS shows worst-case noise contours for locations in Rockland County. These contours show expected worst-case levels during construction at the buildings and facades cited in the comment. The noise impact analyses presented in the FEIS satisfy all applicable regulations. No additional analyses are required. See also the response to Comment 18-27.

C 18-30: In our comments on the DEIS we requested performance standards based on noise increases at the receptors. We had proposed using the Central Artery as a model which limited increases to 5 dBA over background. The Authority declined and proposed performance standards at 50' from the noise source. The FEIS also presented modeled construction noise increases to bound the potential impacts. It should be noted that none of the residences in Tarrytown are currently projected not to have ANY adverse construction noise impacts, with increases being 3 dBA or less, which is reasonable with respect to the Central Artery limits. (Crossan)

R 18-30: The FEIS has identified the noise abatement measures and criteria to which the Design-Build contractor will be required to adhere. These measures and criteria are reasonable and consistent with NYSTA practices with regard to other projects.

C 18-31: Yet the residential Rockland sites are projected to have significant adverse noise impacts: Site 5 up to 10 dBA; Site 7up to 7 dBA; and Site 8 up to 4 dBA. It is unfair and unacceptable that mitigation measures have been designed to eliminate adverse impacts in Westchester County, while allowing potential adverse impacts in Rockland County that far exceed any reasonable performance standard. Thus, all Rockland County residential properties, including Salisbury, should be evaluated for receptor controls. (Crossan)

R 18-31: See response to Comment 18-101 in Chapter 24 of the FEIS. The commenter is incorrect in implying that mitigation measures have been designed for Westchester County and not for Rockland County. The same noise abatement measures have been proposed for both Westchester and Rockland Counties. Existing regulations do not allow funding for receptor insulation for private residences.

C 18-32: The temporary access road exit from the Rockland Bridge Staging Area in the River is to be constructed immediately to the south of Salisbury. How this road can be constructed, used, and demolished all while not increasing noise levels Salisbury needs to be clarified. To the extent that these clarification needs to be postponed until the Design Build contractor is selected, a Supplemental Noise Analysis needs to be conducted and released for public review. If new noise impacts are identified this should be circulated as a focused SEIS that considers additional mitigation measures. (Crossan)

R 18-32: There will be some increases in noise levels during the time periods when the temporary access road from the Rockland Bridge Staging Area is

constructed, and when it is demolished. However, these increases will occur for very limited time periods. This temporary roadway will be constructed with sound barriers to reduce noise impacts from the limited number of vehicles using this temporary roadway. The limited number of trucks using this roadway are not expected to result in a substantial increase in noise levels (i.e., the increase is expected to be less than 6 dBA). The construction noise analysis presented in the FEIS analysis included the effects of vehicles using this temporary roadway.

C 18-33: In our comments on the DEIS we reported interior noise levels of 51 to 55 dBA. These values far exceed USEPA's recommended limit of 45 dBA. That 45 dBA level has been adopted by the City of New York as being protective of the health and welfare of the residents. Given that interior noise levels far exceed a reasonable limit that is protective of health and welfare, and they will be subject to additional construction noise, and traffic noise increases from a roadway moving closer that cannot be fully mitigated, that receptor controls in the form of replacement windows be added. (Crossan)

R 18-33: See response to Comment 18-101 in Chapter 24 of the FEIS regarding replacement windows. In addition, with regard to traffic noise increases due to the relocation of the roadway slightly closer to the Salisbury Point Cooperative, with the proposed noise barrier, noise levels at most, if not all, locations in the Salisbury Point Cooperative with the Selected Alternative would be lower than existing noise levels.

C 18-34: We received (on 30 August 2012) a 4 page noise memo dated 26 July 2012. It is based on monitoring conducted at Salisbury on 27 April (Fri), 2 May (Wed), 3 May (Thurs), and 5 May (Sat), and at The Quay on 14 May (Mon) and 12 July (Thur). Why was this not an Appendix to the FEIS? (Crossan)

R 18-34: The memo cited in this comment had not been finalized and was not available at the time the FEIS was published. However, the results of the noise monitoring were available and were referred to on page 18-56 of the FEIS. The results with regard to vibration levels were referred to in the response to Comment 18-74 in Chapter 24 of the FEIS.

C 18-35: The monitoring data included in the report raises many issues with respect to claims and representations made in the DEIS and FEIS. Figure 12-3 in the FEIS shows a dBA variation in noise levels from 7 am to 6 pm. The data at Salisbury shows a range of 5 dBA on 27 April, 4 dBA on 2 May, and 2 dBA on 3 May. The data at The Quay shows a range of 8 dBA on 12 July. The reasons and significance of this high variability are not discussed in the 26 July memo. We believe that one of the reasons for these wide differences is the fact that the noise transmission over water is dramatically influenced by meteorological conditions. The reasons for these large ranges need to be explained based up a technical analysis. This should be part of the SEIS. (Crossan)

R 18-35: It is not correct that "the monitoring data included in the [August 30th] report raises many issues with respect to claims and representation made in the DEIS and FEIS." Figure 12-3 in the FEIS shows data that were gathered at a monitoring site that was adjacent to Interstate 87/287 that was used to determine the peak hour for noise analysis purposes. As discussed in the FEIS on page 12-8, that data showed that the peak noise period was between 7 AM and 9 AM. This is consistent with measured data shown in Table 1 (from Salisbury Point Cooperative) and Table 2 (from The Quay Condominiums) in terms of when the peak noise period occurs. The data from Salisbury Point Cooperative showed that noise levels during the peak noise period varied by approximately 3 dBA for the 3 days of measurements at that location. This variation is not unusual given the variability of traffic and other conditions that might affect the measured noise levels. The variability over the course of the entire 12-hour measurement periods is of limited concern, since the modeling analysis, which was based upon use of the TNM 2.5 model, examined changes in noise levels during the peak noise period. The most important issue in terms of assessing project impacts is ultimately the change in noise levels due to the proposed project alternatives, and the TNM 2.5 model, as used for the FEIS, provides an appropriate tool to evaluate these changes. Variations in daily noise levels can occur due to a variety of factors, including traffic volumes and vehicle speeds, and there is no basis to conclude that the comment's assertion that the measured variation was due to meteorological factors. No SEIS is required in relation to the issue raised by this comment. Please see the response to Comment 18-28.

C 18-36: The wide variation of the 7am Leq at Salisbury (varies from 63 to 66 dBA) raises issues as to the accuracy of the modeling of the noise at sites that are along the River. We do not believe that the TNM model can be validated using the Salisbury monitoring data. An attempt should be made to validate it in the SEIS. (Crossan)

R 18-36: See response to Comment 18-35. There is no need to perform additional validation studies using this recently obtained data. No SEIS is required in relation to the issue raised by this comment. See the response to Comment 18-28.

C 18-37: If TNM cannot be verified using the Salisbury data we believe that all the noise modeling (both TNM and construction noise) at Salisbury, as well as the Tarrytown riverfront neighborhoods (Irving, The Quay, and Tappan Landing) cannot be considered valid. The issue of enhanced noise transmission over water and the effect of meteorological conditions would need to be explored further. (Crossan)

R 18-37: See responses to Comments 18-35 and 18-36.

C 18-38: The fact that the calculated Lmax at 50' was 107 dBA at Salisbury and 100 dBA at The Quay is totally unexplained. Just to be clear on this point – the

107 dBA is the result of a source that is 5 times louder than the one that generated 100 dBA. This is a massive difference that needs to be explained.

This raises several unanswered questions:

a. Were there operational or equipment differences that caused or contributed to this variation?

b. Were there meteorological differences that caused or contributed to it?

c. Did AKRF have observers on or near the pile driving to verify the operational activities? (Crossan)

The fact that with only two data points and such a wide variation (107 vs 100 dBA) that is totally unexplained raises the very real concern that 107 dBA Lmax at 50' may not be the worst case as was represented in the memo and FEIS. If there were two more data points maybe the worst case is really 114 is totally unexplained raises the very real concern that 107 dBA Lmax at 50' may not be the worst case as was represented in the memo and FEIS. If there were two more data points maybe the worst case is really 114 dBA. This point needs to be addressed. (Crossan)

R 18-38: The noise from pile driving is a function of many factors, most notably the energy or force of the hammer, and the characteristics of the medium the pile is being driven into. A variation of 7 or more dBA in noise level based upon a limited test of this type, which includes measurements made in various types of river bottom materials, is not unusual. The L_{max} value of 107 dBA (at a distance of 50 feet), which was calculated based upon measured noise levels and used in the construction noise analyses presented in the FEIS, is higher than the 101 dBA value that is contained in the RCNM model and typically used for these types of analyses, thus yielding conservative results. However, ultimately the measured values are not very important since noise abatement will require an L_{max} value of 90 dBA at 50 feet.

C 18-39: There was no attempt in the memo to develop and implement a monitoring protocol for actually measuring noise levels at 50'. A monitoring protocol at 50' for the pile driving should be developed and described in the SEIS. (Crossan)

R 18-39: See response to Comment 18-38. A procedure will be developed to certify that the pile drivers are complying with the 90 dBA L_{max} requirement.

C 18-40: Because of the wide variability in the monitoring data at Salisbury, compliance with the 50 dBA limits must be determined by monitoring at 50', not by monitoring at remote receptors and then calculating what the values at 50' likely were. The Authority needs to develop and publically release their compliance noise monitoring protocols and data. (Crossan)

R 18-40: See response to Comment 18-39. A procedure will be developed to certify that the pile drivers are complying with the 90 dBA L_{max} requirement. When information on the compliance noise monitoring protocol is developed it will

be available through the Public Information Program. (The 50 dBA limit referred to in this comment is a mistake.)

C 18-41: The fact that an important opportunity was lost to concurrently monitor pile driving at 50' and at longer distances (to be able to calculate actual attenuation rates) was missed raises serious questions as to whether the Authority takes the issue of noise attenuation over water, and mitigation compliance seriously. We have previously brought these issues up in comments on the DEIS and at subsequent meetings with AKRF and the Authority. The wide range of monitored data and modeling calculations presented in the 26 July memo demonstrate conclusively the Authority needs to address these concerns on a technical basis in a SEIS. Ignoring the concerns that we raise when your own unexplained data supports these concerns is no longer a viable option. (Crossan)

R 18-41: Please see responses to Comments 18-28, 18-34, and 18-35 above.

C 18-42: The potential construction noise impacts to the communities (the Irving neighborhood, The Quay, and the Tappan Landing neighborhood) along the Hudson River (and the Amtrak/MetroNorth rail line) are understated because of the inclusion of the rail noise in the background noise values. We do not know by how much because the number of diesel and electric trains were not counted during the noise monitoring. The peak noise from the diesel trains is a far louder than the traffic noise; however, it only occurs for short periods of time (less than 4 minutes of any hour). It is loud enough to measureably raise the Leq, but is not off long enough duration to raise the L10 (because the diesel train noise is far less than 10% of the total time). The diesel trains could easily raise the monitored Leq by 4 to 6 dBA or more. Thus, a projected 3 dBA increase over 1 hour could in reality be a 9 dBA increase for 56 minutes of that hour. There should be disclosure of the monitored L10 and Lmax values in the supplemental noise studies. Should new impacts be uncovered as a result of this disclosure a focused Supplemental EIS (SEIS) should be prepared. Additional mitigation should be analyzed and proposed. (Crossan)

R 18-42: See response to Comment 18-13. The lack of inclusion of L_{10} and L_{max} is not an error, does not trigger the need for supplemental studies, and does not require the preparation of an SEIS (see the response to Comment 18-28).

The noise contours in Figure 18-14 of the FEIS show noise level values that are not dependent on ambient noise levels, and consequently, are unaffected by rail noise. Please refer to the response to Comment 18-91 in Chapter 24 of the FEIS with respect to the analysis of train noise.

C 18-43: There is one monitoring site in the Irving neighborhood (#4). Site 4 is projected to have a maximum construction noise increase of 1 dBA, which is not an impact. Reliance on this modeling would indicate that the Irving neighborhood will not be subject to ANY construction noise impacts for ANY period of time. It would seem logical that one of the three Westchester noise

and vibration monitoring sites should be located in the Irving neighborhood. If future monitoring showed any increases over 3 dBA then a supplemental noise analysis and additional mitigation would be required as part of a focused SEIS. (Crossan)

R 18-43: NYSTA will consider the request that one of the Westchester noise and vibration monitoring sites should be located in the Irving neighborhood. Any substantial changes in the project and/or new information and circumstances relevant to environmental concerns and bearing on the proposed action or its impacts that arise after the FEIS is completed will be evaluated to determine whether they would require a Supplemental EIS.

C 18-44: The sole temporary access road to the Westchester Bridge Staging Area in the River is to be constructed immediately to the north of the Irving neighborhood. How this road can be constructed, used, and demolished all while not increasing noise levels in the Irving neighborhood needs to be clarified. To the extent that this clarification needs to be postponed until the Design Build contractor is selected, a Supplemental Noise Analysis needs to be conducted and released for public review at that time. If new noise impacts are identified this should be circulated as a focused Supplemental EIS that considers additional mitigation measures. (Crossan)

R 18-44: There will be some increase in noise levels during the time periods when the temporary access road from the Westchester Bridge Staging Area is constructed, and when it is demolished. However these increases will occur for very limited time periods. This temporary roadway will be constructed with sound barriers to reduce noise impacts from the limited number of vehicles using this temporary roadway. The limited number of trucks using this roadway are not expected to result in a substantial increase in noise (i.e., the increase in noise levels would be less than 6 dBA). The construction noise analysis presented in the FEIS included the effects of vehicles using this temporary roadway. Accordingly, there is no need for an SEIS.

C 18-45: This construction road, once it crosses the railroad tracks and gets to the river bank, will turn to the north paralleling the river to get to the staging area access point. As indicated in the DEIS, and clarified in subsequent meetings with the Authority, this portion of the access road may require pile driving. If this is the case, the Supplemental noise analysis discussed above should include this activity. (Crossan)

R 18-45: Construction of this temporary access road was analyzed in the FEIS and would not require an SEIS. There may be the need for some limited pile driving in connection with construction of this temporary roadway. Construction activities associated with this temporary roadway will take a limited time period and have minimal noise impacts.

C 18-46: There is one monitoring site in the Tappan Landing neighborhood (#1). Site 1 is projected to have a maximum construction noise increase of 3 dBA,

which is not an impact. Reliance on this modeling would indicate that the Tappan Landing neighborhood will not be subject to ANY noise impacts for ANY period of time. It would seem logical that one of the three Westchester noise and vibration monitoring sites should be located in the Tappan Landing neighborhood. If future monitoring showed any increases over 3 dBA then a supplemental noise analysis and additional mitigation would be required as part of a focused SEIS. (Crossan)

R 18-46: NYSTA will consider the request that one of the Westchester noise and vibration monitoring sites should be located in the Tappan Landing neighborhood. Any substantial changes in the project and/or new information and circumstances relevant to environmental concerns and bearing on the proposed action or its impacts that arise after the FEIS is completed will be evaluated to determine whether they would require a Supplemental EIS.

C 18-47: The temporary access road, the Westchester Bridge Staging Area, and direct access to it are immediately adjacent to or directly off-shore from The Quay. Once the Design Build contractor is selected a Supplemental Noise Analysis needs to be conducted and released for public review. If new noise impacts are identified, this should be circulated as a focused Supplemental EIS that considers additional mitigation measures. (Crossan)

R 18-47: Noise impacts related to the Westchester Bridge Staging Area were fully analyzed in the EIS and will not require additional analysis following the selection of the Design-Builder.

C 18-48: There are no current monitoring sites in The Quay. It would seem logical that one of the three Westchester noise and vibration monitoring sites should be located in the Tappan Landing neighborhood. However, it is currently unclear what construction noise impacts the FEIS is disclosing for The Quay. The residential location just to the north (Site 1) indicates that there would be NO noise impacts during construction. The non-residential site just to the south (Site 2) indicates that maximum construction noises increases of 10 dBA for up to 6 months are possible. Since the FEIS elected not to clarify this point, it is reasonable to take the most conservative assumption that Site 1 is representative of all the units in The Quay. This means that there are no projected construction noise impacts at The Quay disclosed in the FEIS. lf it determined that there would be impacts (i.e. increases of more than 3 dBA) then a SEIS should be prepared with additional mitigation analyses. (Crossan)

R 18-48: See response to Comment 18-46. Figure 18-14 of the FEIS shows $L_{eq(1)}$ noise contours for “worst case” construction conditions on the Westchester side of the Hudson River. These contours allow the reader to estimate what “worst-case” noise levels would be due to construction. “Worst case” noise levels due to construction at the Quay Condominiums would be expected to be less than at Site 2 (more than at Site 1), and the increase in noise levels at the Quay Condominiums would be expected to be above 6 dBA.

As provided in the response to Comment 18-83 in Chapter 24 of the FEIS:

> "The EIS acknowledges that construction activities would result in noise impacts at The Quay condominium complex. The document states that even with noise abatement measures, at some receptor location and locations near some receptor sites, during some time periods, construction activities will result in noise levels which would be intrusive, and noisy, and result in unmitigated noise impacts."

There is no need for additional mitigation analyses with regard to this issue.

C 18-49: The FEIS currently represents that with mitigation as proposed there will not be ANY noise impacts (i.e. no noise level increases of more than 3 dBA Leq at ANY of the residences in Tarrytown. Should future studies by the Design Build contractor, or future monitoring demonstrate that there are or would be impacts then a focused SEIS must be prepared with additional mitigation measures evaluated. These additional mitigation measures should consider receptor controls. (Crossan)

R 18-49: Any substantial changes in the project and/or new information and circumstances relevant to environmental concerns and bearing on the proposed action or its impacts that arise after the FEIS is completed will be evaluated to determine whether they would require a Supplemental EIS.

C 18-50: The Authority should clarify that the noise walls on the Westchester Bridge Staging Area will also be on the north side so that the marina and Losee Park will be protected. (Crossan)

R 18-50: The temporary noise barrier at the Westchester Bridge Staging Area will include the north side facing the marina and Losee Park.

A-2-18-3 ECOLOGY

C 18-51: While the FEIS calls for compensatory mitigation measures to offset dredging-related impacts to the benthic community, including the restoration of 13 acres of hard bottom/shell oyster habitat in the immediate vicinity of the existing bridge and reintroduction of oysters to the habitat (FEIS at 16-40), the document is extremely short on details as to how and where this will occur.

Baykeeper supports the requirements set forth by both the New York State Department of Environmental Conservation and National Marine Fisheries Service in their July 2012 correspondence for the mitigation and restoration plan for restoring oyster reef habitat and would add the following comments:

- All efforts must be made to further reduce impacts to oyster habitat and live oysters. An impact of this magnitude could have serious repercussions for the much larger ecosystem of fledging oyster research and restoration efforts.
- Baykeeper has partnered with 20 scientists, not-for-profit groups and government agencies on the Oyster Restoration Research Project

(ORRP) on the first stage of an ambitious research effort to determine if oysters can once again flourish in the waters of NY Harbor. Since 2010, ORRP has constructed five research oyster reefs, including one in the Hudson River at Hastings-on-Hudson, just south of the proposed impacted area. We urge NYS to work with our partnership to understand how to best reintroduce oyster habitat in the impacted area.

- Baykeeper supports the collection and maintenance of live oysters from the impacted area for the establishment of a brood stock for future restoration efforts. Our experience has shown that oysters adapt to local conditions and any larvae or spat for future restoration work should be derived from local oysters. Our experience has also shown this is difficult to do and NYS should enlist the appropriate expertise to ensure that conditions are optimal not only to store the live animals for the duration of the project, but also to develop spawning conditions.
- There should be additional restoration required for the temporary loss of the oyster habitat during the duration of the Project. (Mans)

R 18-51: The project sponsors acknowledge the ongoing efforts and experience of the ORRP in restoring oysters to the Hudson-Raritan Estuary and will seek input from the ORRP on advancing restoration plans for 13 acres of hard bottom/shell oyster habitat in the vicinity of the bridge and reintroduction of oysters to the habitat. The 13 acres of oyster restoration conservatively assumes that all of the oyster habitat will be permanently lost, which may not occur, and would, therefore, over-compensate for any temporary loss of oyster habitat during the duration of the project.

While oysters do adapt to local conditions, the source populations for recruitment of larvae to a particular location within the river is difficult to determine. Although the source of oyster larvae is unknown, the presence of oysters indicates that the system can support some level of settlement and growth. Factors that determine the fitness, survival, and transport of larvae are complex and involve processes within the entire estuarine portion of the Hudson, as oyster larvae spend weeks as plankton in the water column. It is highly unlikely that recruitment of oyster larvae to the Tappan Zee area located at the upper end of habitability for oysters, which is at the lower end of salinity tolerance and the upper end of estuarine transport, is from local populations. Maintaining local oyster in culture for reintroduction after the project is completed is not likely to provide any advantage over recruitment from other populations within the river, would be costly to implement and also would run a high risk of failure. During the five-year project, it is expected that oysters will continue to recruit to hard substrates in the area, if salinity conditions are suitable. Continued success of oysters in the Tappan Zee region will result from a combination of estuarine circulation to deliver larvae and appropriate salinity levels to insure their survival.

C 18-52: NMFS utilizes the Bath Iron Works' (BIW) permit as a source of information to predict inaccurate conclusions, regarding the effects of dredging, for the TZB project. The BO issued for the BIW permit, for dredging the Kennebec

River in Maine, details the BIW project. Dredging at the BIW facility would entail the removal of 303,500 CY of material over six years (50,583 CY, on average, per year). NMFS estimates that one shortnose sturgeon is likely to be captured during each year that dredging maintenance at the BIW facility will occur, or every 50,583 CY of material removed. Over the three year period that dredging will occur at the Tappan Zee Bridge (TZB) project site, a total of 1.68 – 1.74 million CY of material is to be removed. By utilizing NMFS' estimate developed for dredging at the BIW facility, of one mortally injured shortnose sturgeon per 50,583 CY of material removed, the TZB dredging can be expected to mortally injure 33 shortnose sturgeon. NMFS does not account for this major size difference within projects. Dredging is a principal threat to the shortnose sturgeon's survival. Sturgeons are known to be sensitive to anthropogenic impacts. Habitat modification, such as that caused by dredging and other construction activities, is one of the main factors responsible for the decreasing abundance of most sturgeon species and populations. Any and all potential impacts from the TZB project must be fully assessed to ensure the safety of the Atlantic and shortnose sturgeon. (Huddleston)

R 18-52: The commenter asserts that NMFS used the Biological Opinion (BO) for the Bath Iron Works (BIW) permit as a basis for estimating potential dredge-related take from the Tappan Zee Hudson River Crossing project (TZ), but then goes on to make inappropriate comparisons in an attempt to scale potential losses from BIW to TZ. The commenter fails to recognize some notable differences between the two projects and neglects to consider the actual take of sturgeon observed over 15 years of dredging at BIW in favor of predicted take estimates. The use of predicted take estimates in the commenter's calculations results in higher potential losses at TZ than those that would be projected if the actual dredge-related take observed at BIW was used.

In the TZ BO, NMFS indicates that 15 years of 100% observer coverage during dredging operations at BIW (which occurred every 1-2 years) resulted in a total of three fish captured. Only one of those three fish suffered mortality. In contrast, the commenter used the predicted take estimate at BIW (i.e., 6 sturgeon over 6 years of dredging). This selective use of information results in a substantially higher rate of take of 1 sturgeon per year compared to that derived from the actual observed take at BIW, which was 1 sturgeon per 5 years. Furthermore, it is incorrectly asserted that 33 sturgeon represents the number that can be expected to be mortally injured at Tappan Zee. This is despite their earlier statement in the same comment that correctly asserts that the NMFS take estimate represents capture by the dredge, not mortal injury. Based on actual take observations at BIW, NMFS expects "a similar mortality rate at the Tappan Zee project as has been observed at BIW…no more than one of the three captured shortnose sturgeon and no more than one of the three captured Atlantic sturgeon to be injured or killed during dredging operations."

Aside from the misapplication of take estimates from the BIW BO, there are a number of notable differences between BIW and TZ that qualify the use of take at BIW to estimate take at TZ. First, NMFS stated in the TZ BO that, "Due to the nature of interactions between listed species and dredge operations, it is difficult to predict the number of interactions that are likely to occur from a particular dredging operation. Projects that occur in an identical location with the same equipment year after year may result in interactions in some years and none in other years." In other words, it is difficult to predict take at a given location, let alone extrapolate among locations.

Furthermore, there appears to be higher sturgeon densities at BIW than at TZ based on statements in the BIW BO. NMFS states that, "…trawling activities from 1999-2001 consistently captured shortnose sturgeon in the BIW area from April through November when trawls were deployed." NMFS also states that, "During the June through September time period, large concentrations of adult fish are known to be actively foraging in this region and hundreds of shortnose sturgeon have been documented in the action area at this time." In contrast, only 11 shortnose and Atlantic sturgeon were collected during ten years of Utilities sampling (1998-2007) in the Tappan Zee region, and of the 159 sturgeon detected in the Tappan Zee region during the Pile Installation Demonstration Project (PIDP), almost all occurred in waters deeper than the proposed dredged area and would therefore not be susceptible to dredge-related impacts.

Third, differences in water depth between BIW and TZ were not taken into account in the comment. Sturgeon are more likely to be encountered in deep-water habitat than in the shallow areas proposed for dredging of the TZ, as indicated by detection of acoustic-tagged sturgeon during the PIDP. Sturgeon are more likely to be encountered at the dredging site at BIW because of the deeper water (70 feet) compared to Tappan Zee where the majority of the river depth is less than 35 feet.

Despite the frequency of dredging activity at BIW (every 1-2 years) combined with the apparently high sturgeon abundance there compared to TZ, and the preferable deep-water habitat in which dredging occurred, no sturgeon were taken by the dredge at BIW in the 5-6 year period from 2003-2009 and only 1 sturgeon was taken in the 7-8 year period from 2003-2011. Therefore, actual sturgeon take was considerably less than predicted by NMFS in the BIW BO. For this reason, and because of the differences between BIW and TZ dredge projects outlined above, along with the difficulty in predicting take within project years and between projects, it is inappropriate to scale previous take estimates from other dredge projects to estimate potential dredge-related take at TZ.

Although dredging has been cited as a potential threat to sturgeon populations, NMFS has determined in the BO that cumulative project impacts, including dredging, "may adversely affect but [are] not likely to jeopardize the continued existence of shortnose sturgeon or any DPS of Atlantic sturgeon." Dredging impacts to sturgeon will be limited to the August 1 to November 1 dredging window established by NMFS and NYSDEC,

"which would minimize the potential for interaction with the dredge and migration effects to sturgeon and other fish species" as determined by NMFS in the BO. Impacts will be further minimized through the use of mechanical dredging with an environmental bucket, which is likely to have fewer impacts on the two sturgeon species than other techniques (e.g., hydraulic dredging). This is clearly articulated in the BO by NMFS when they state, "Regardless, based on all available evidence, the risk of capture in a mechanical dredge is low due to the slow speed at which the bucket moves and the relatively small area of the bottom it interacts with at any one time."

Dredging impacts related to loss of foraging habitats were also determined by NMFS to be minimal "because similar habitat is available nearby and because sturgeon are highly mobile and move throughout the estuary and river during the summer months while foraging, any effects on sturgeon movements are likely to be within their normal foraging behaviors. The very small amount of habitat lost, and the temporary nature of this loss, makes it extremely unlikely that the ability of sturgeon to find appropriate forage in sufficient quantities would be reduced." Similarly, because sediment resuspension "is likely to be within the range of normal suspended sediment levels in the Hudson River, it is unlikely to affect the movement of individual sturgeon." The BO goes on to state, "As sturgeon are highly mobile any effect on their movements or behavior is likely to be insignificant" and the "effects to benthic resources that sturgeon may eat are extremely unlikely. Based on this information, it is likely that the effects of increased suspended sediment and turbidity will be insignificant."

Based on the NMFS determination and the efforts to minimize project-related dredging impacts to sturgeon, dredging activities to be conducted during the proposed project will not jeopardize either sturgeon species.

The Hatin et al. paper cited in the comment studied the effects of dredged sediment deposition at an open water disposal site, not the effects of dredging itself. "Sound bytes" taken from the paper reflect certain points made by the authors about dredging effects in general, and are selectively edited in the comment, but are not directly relevant to the research findings of Hatin et al.

Sturgeon would be expected to forage over coarse sediments such as that of the armored bottom. Atlantic and shortnose sturgeon are benthic omnivores that forage opportunistically. Although both sturgeon species frequently forage in fine sediments in the Hudson River (Sweka et al. 2007), they have been reported to occur most commonly over coarse sediments in other rivers (e.g., Connecticut, Merrimack) and in the Atlantic Ocean where they feed on benthic prey organisms (Kynard et al. 2000, Savoy and Pacileo 2003, Stein et al. 2004).

The commenter also indicates that all potential impacts of the "TZB project must be fully assessed to ensure the safety of the Atlantic and shortnose sturgeon." In the BO, NMFS has done exactly that by providing a comprehensive review of existing data and studies conducted for each

species, and a thorough analysis of potential effects from a variety of sources, including mechanical dredging. NMFS has set the allowable interaction of Atlantic and shortnose sturgeon and dredging operations at three fish, with allowable mortality of one fish of each species, and has required trained observers to be present throughout dredging operations. By establishing very low take numbers, NMFS has clearly ensured the safety of the two sturgeon species as any exceedance of these very low take numbers would require re-initiation of consultation with NMFS.

C 18-53: During the one year gillnet survey, conducted by AECOM, a total of 12 shortnose sturgeon were captured; 7 of which were caught in the vicinity of the bridge during September and October. Dredging would occur between August 1st and November 1st, when more than 50% of the shortnose sturgeon were caught. The dredging window must be more closely examined for temporal impacts through additional gillnet surveys and utilization of historic U.S. Fish and Wildlife Service (USFWS) and NYSDEC tagging and tracking and sampling surveys. (Huddleston)

R 18-53: Seven of 12 shortnose sturgeon were indeed collected by AECOM gill nets during September and October; of these 7 sturgeon however, only 2 sturgeon were collected at depths shallower than 15 feet, where the majority of dredging activities would occur during project construction.

The August 1st to November 1st dredge window was established by NMFS and NYSDEC and considered the distribution of each life stage of sturgeon. Furthermore, the field studies conducted by AECOM were performed after consultation with NMFS and NYSDEC and neither agency required additional studies beyond those performed.

Sufficient information on sturgeon life histories exists to support the selection of the dredge window established by NMFS and NYSDEC. According to literature studies and NYSDEC acoustic tagging data, the Tappan Zee bridge area is primarily a migration corridor for adult Atlantic sturgeon. Movement of Atlantic sturgeon during the spawning migration has been described as deliberate, with females moving directly to the spawning grounds (Dovel and Berggren 1983). Atlantic sturgeon apparently do not feed during the spawning migration (Dadswell 1979, Smith 1985). Because of their short residence time and lack of feeding in the Tappan Zee bridge area, adult Atlantic sturgeon are not likely to be significantly affected by dredging activities during the proposed window. Spawning by both sturgeon species occurs in the spring and summer (April-July) in the freshwater reaches of the Hudson River (Bain 1997). Eggs and larvae of both sturgeon species occur well upstream of the Tappan Zee region (RM 24-33) (Bain 1997) and would not be susceptible to dredging activities regardless of the timing of these activities. The highest abundances of juvenile and adult shortnose sturgeon and juvenile Atlantic sturgeon are located between West Point and Hyde Park (RM 47-85), based on Utilities-sponsored fisheries data collected from July through December 1998-2007. Juvenile Atlantic sturgeon were most abundant in this river reach (i.e. RM 47-85) between August and

October, but were rarely collected in the Tappan Zee region, with only 2 of 235 juvenile Atlantic sturgeon collected there during the proposed dredge window. Sub-adult and adult Atlantic sturgeon migrate through the Tappan Zee region from early April to late June and most leave the river by late July, based on tagging and tracking studies conducted by NYSDEC (2011). Juvenile Atlantic sturgeon are thought to overwinter between October and March upstream of Tappan Zee in the deeper waters of Haverstraw Bay (RM 34-38) based on an historic USFWS sampling survey by Sweka et al. (2007). Because of their limited occurrence in the Tappan Zee region throughout the year and their preference for deeper water, the majority of Atlantic sturgeon would not be exposed to dredging activities during the dredge window.

C 18-54: The BO readily acknowledges that there are no data for shortnose or Atlantic sturgeon regarding hearing sensitivity or the structure of their auditory systems. NMFS use data available for lake sturgeon. Lake sturgeon in New York average a length of 3-5 feet, while Atlantic sturgeon are typically much larger, 6-10 feet, and shortnose sturgeon are typically smaller, less than 3.5 feet. Generally, smaller fish are more vulnerable to injuries endured from sound than larger fish. Furthermore, lake sturgeon are primarily found in freshwater habitats while the shortnose and Atlantic sturgeon within the project area will be in brackish waters. Because seawater has a higher density than freshwater, sound travels faster and with greater frequency in seawater than freshwater. For these reasons, NMFS needs to assess the Atlantic and shortnose sturgeon individually, since the noise from pile driving will affect each fish differently. (Huddleston)

R 18-54: In the BO, NMFS stated that lake sturgeon "for the purpose of considering acoustic impacts, can be considered as a surrogate for shortnose and Atlantic sturgeon." Dr. Arthur Popper of the University of Maryland, an acknowledged expert on the impacts of noise on fishes, indicates that while there are no data on hearing for the sturgeon in the Hudson River, data on a number of species, including members of the same taxonomic genus, show that the ears and auditory system of all sturgeons are very similar to one another (Popper 1978; Lovell et al. 2005). Therefore, lake sturgeon are a reasonable surrogate for shortnose and Atlantic sturgeon. Furthermore, according to Dr. Popper there is strong evidence that hearing does not change as fishes grow and that the hearing capabilities of a small fish in a species are no different than that of a larger fish. Because shortnose sturgeon collected during the AECOM gill-net survey ranged in size from 2,900 to 5,200 grams the expected onset of physiological effects would occur at noise levels much greater than the current NOAA criteria, which is based on much smaller fish (i.e., ≥ 2 grams). This prediction is supported by published studies, (e.g. Carlson et al. 2007; Halvorsen et al. 2012a,b) which demonstrate that the onset of physiological effects for sturgeon at the sizes found in the vicinity of the Tappan Zee Bridge would occur at noise levels that are greater than those observed during the PIDP. Dr. Popper also dismisses the assertion that differences in sound propagation between

freshwater and brackish waters invalidate the use of information on freshwater lake sturgeon to assess potential noise impacts on shortnose and Atlantic sturgeon in brackish waters. Hearing frequency range and sensitivity in all animals, is based on detection of sound frequency and sound intensity (amplitude) and not on the wavelength or speed of sound. Thus, even if the wavelength of the sound changes dramatically between fresh and salt water, frequency and amplitude does not change, and so hearing capabilities would not differ between freshwater fish and salt water fish.

C 18-55: The BO acknowledges the data used regarding lake sturgeon (the surrogate used for both the Atlantic and shortnose sturgeon) (Lovell et al. 2005; Meyer et al. 2010) examines the responses of the ear rather than whether or not the fish respond to the sounds detected by the ear. It is therefore hard to determine the lake sturgeon's hearing threshold because of this lack of data. The BO goes on to state that the lake sturgeon has a hearing range from below 100 Hz to 800 Hz. Initial studies (unpublished) by Meyer and Popper suggest that some species within the *Acipenser* genus of sturgeon may be able to detect sounds from below 100 Hz to over 1,000 Hz. Based on the Meyer and Popper data, impacts to Atlantic and shortnose sturgeon due to an increased hearing range need to be examined. (Huddleston)

R 18-55: According to Dr. Popper, sturgeon are low-frequency hearing animals meaning that it makes no difference in their behavioral response to pile-driving sounds whether the upper hearing limit is 800 or 1,000 Hz, since best sensitivity is between 200 and 300 Hz and hearing at higher frequencies is quite poor, particularly due to the dampening effect of ambient noise. Furthermore, as indicated in the PIDP report (JASCO 2012 pg 50), the bulk of energy produced by pile driving is low frequency (i.e., below 1,000 Hz) and the differences in the sound energy that the fish detect will be minimal since best hearing is at low frequencies.

C 18-56: NMFS states in the BO "there are no data that correlate effects of noise on fishes and swim bladder size." Despite this, NMFS continues to draw conclusions from the size of the swim bladder such as "the physiological effects of pile driving on sturgeon may actually be less than on other species due to the small size of their swim bladder." Without data that correlates the effect noise has on fish and swim bladder size, NMFS should not be drawing such conclusions. (Huddleston)

R 18-56: The basis for the statements relating noise effects to swim bladder size and the size of the body cavity (as in sturgeon) is derived on the scientific consensus that most physiological effects result from motions of the walls of the swim bladder striking near-by body structures. In the case of pile driving, the swim bladder walls will be set into position with a relatively high amplitude displacement over and over again. The walls of the swim bladder strike nearby tissues (gonads, kidney, gut) and this is thought to cause abrasion and, over multiple strikes, hematoma (bleeding) (see Popper and Hastings 2009 and Halvorsen et al. 2011, 2012a for detailed explanation). Thus, it follows, as reasoned in the BO, that fish with small swim bladders

(as with sturgeon) will have less internal tissue damage since the swim bladder contacts fewer body tissues than in a species such as salmon or cichlids where more tissues are contacted by the vibrating swim bladder walls (Halvorsen et al. 2012a, b).

C 18-57: Fish with swim bladders, like sturgeon, are suspected to be more likely to experience neurotrauma when exposed to high sound pressures. "Acoustic stunning", loss of consciousness, is expected to be a result of such neurotrauma. When a sturgeon experiences "acoustic stunning", its ability to leave the ensonified area and protect itself from further harm will be greatly reduced, contrary to the BO's assumption that the fish will immediately leave the area. The BO needs to account for possible deaths caused by acoustic stunning. (Huddleston)

R 18-57: To date, there have been no published studies to suggest that sturgeon exhibit neurotrauma resulting in "acoustic stunning" or that they are more susceptible to it than other species. In fact, according to Dr. Popper, there are no published data to suggest that neurotrauma occurs in fish in general. The suggestion in the original comment was based on unpublished and unavailable observations on four blue gourami (*Trichogaster trichopterus*) (Caltrans 2009, p. 3-4), a species of fish that has an air bubble next to the brain – something that does not occur in sturgeon or most other fishes. In the blue gourami, the air bubble in the head is very close to the brain, and so motions of the air bubble are potentially directly transmitted to the brain. In the case of sturgeon, the only air bubble is the swim bladder and its most rostral (front-most) extent is a substantial distance from the brain and other neural tissue. Moreover, since neurotrauma would require exposure to very intense sounds, and since data from the PIDP indicate that sturgeon avoid areas of elevated sound levels from pile driving, it is not likely that neurotrauma would occur in sturgeon or other fishes.

C 18-58: The BO assumes that Atlantic and shortnose sturgeon will leave the ensonified area when pile driving begins and concludes that injury and mortality from pile driving will be rare. This assumption is partially based on the planned utilization of a "soft start". However, either exposure to low levels of sound for a relatively long time, or exposure to higher levels of sound for shorter periods of time, may result in auditory tissue damage or temporary hearing loss. Temporary loss of hearing can prevent the sturgeon from sensing their physical environment (i.e. decreased success in locating prey). The 2009 Caltrans study states that "no studies have examined the long-term effect of exposure to pile driving sounds that may lead to delayed death or, perhaps, to other alteration in behavior that could affect the survival of individuals or of populations of fishes." The study suggests that future research needs to address not only the immediate impacts of pile driving, but the long-term effects it has on fish physiology and behavior. The BO must discuss how hearing loss may inhibit the federally endangered Atlantic and shortnose sturgeon's long term survival. (Huddleston)

R 18-58: In the BO, NMFS determined that the environmental impacts of the proposed project "may adversely affect but [are] not likely to jeopardize the continued existence of shortnose sturgeon or any DPS of Atlantic sturgeon." Potential noise impacts resulting from the proposed project are, therefore, not expected to inhibit the long-term survival of either sturgeon species. Pile-driving noise is unlikely to cause temporary hearing loss at certain frequencies unless sturgeon are very close to the sound source. Temporary hearing loss in fishes is only likely to occur if exposure to lower intensity sounds takes place over many hours or days (Scholick and Yan 2001, 2002; Smith et al. 2004a, b) or if the sound is exceptionally loud, and there needs to be multiple exposures over some period of time in order to elicit even a small amount of temporary hearing loss (e.g., Popper et al. 2005, 2007; Halvorsen et al. 2012c). Moreover, it has been shown that temporary hearing loss resulting from exposure to moderate levels of sound for days or weeks will only occur in species that have adaptations that enhance their hearing sensitivity as compared to most other fishes (e.g., Smith et al. 2004a, b; Wysocki et al. 2007), something not found in sturgeon. Furthermore, the results of the tracking of acoustic-tagged sturgeon during the PIDP found that sturgeon spent significantly less time in the vicinity of test piles during active pile driving compared to the time period before pile driving. These results indicate that sturgeon avoided areas of elevated sound during pile driving, and are not likely to remain in the vicinity of pile-driving activities where they could be exposed to noise levels that would result in temporary hearing loss. More importantly, sturgeon do not possess the physiological adaptations for specialized hearing that would make them susceptible to hearing loss and therefore, are not likely to experience temporary hearing loss as a result of exposure to pile-driving noise.

C 18-59: The BO uses conclusions from a 2003 Plachta and Popper study on the American shad (20-24 inches long) to draw a generalized conclusion on fish's behavioral response to different sound intensities. The American shad has a much larger hearing range than that of the Atlantic and shortnose sturgeon. Inferring the sturgeon's behavioral responses to sound from that of the American shad is contradictory of the BO's prior statement that "behavioral responses can vary substantially, even within a single species…Thus, it may be difficult to assign a single criterion above which behavioral responses to noise would occur." The BO cannot use the behavioral responses observed by American shad to predict responses in the shortnose and Atlantic sturgeon. (Huddleston)

R 18-59: The point made by NMFS in the BO was to show that fish react to high-intensity sounds in ways that would result in their moving away from any loud signal, not necessarily the specific intensity that would elicit the avoidance response. Differences in the range of frequencies detected by shad and sturgeon are not a relevant issue in this case.

C 18-60: The BO claims that geographic features, such as narrow migration corridors and shallow/narrow river channels, are not present in the Hudson River.

While that is normally true, during the installation of the piles the corridor available for fish to move through without being subject to behavioral or physiological effects will be limited. Locations that have relatively narrow waterways seem to be more prone to ship strikes. Although the increase in traffic associated with the bridge replacement project is small, any expected increase in boating traffic increases the potential for Atlantic sturgeon to be struck by boats. The BO must account for deaths to sturgeons due to vessel strikes during pile driving activities. (Huddleston)

R 18-60: NMFS has determined in the BO that "given the small increase in vessel traffic, the slow speeds that these vessels are expected to operate at, and the navigational clearance in the area, it is unlikely that there would be any detectable increase in the risk of vessel strike. As such, effects to shortnose and Atlantic sturgeon from the increase in vessel traffic are likely to be discountable."

Subadult and adult Atlantic sturgeon migrate through the Tappan Zee region during spring (April-May) and late summer (July) months. During this migration (and during much of the life history for both species), sturgeon are concentrated in the deep-water areas (25-45 feet) of the river channel or in the Atlantic Ocean (e.g., Dovel et al. 1992, Bain 1997). During the PIDP, nearly all detections of acoustic-tagged sturgeon were made by receivers located near the deep channel. At these depths, vessel strikes are less likely than in shallow water areas; only two acoustic-tagged fish were detected in the shallow waters on the western side of the river.

While it is true that vessel strikes are more common in rivers with narrow channels and heavy shipping traffic where major ports are located in upriver portions of the estuary (e.g., Delaware River), this is not true of the Hudson River, where the heaviest vessel traffic is present in the relatively wide New York Harbor area at the mouth of the river. Vessel traffic in the Tappan Zee region is significantly less than that in the New York Harbor area (http://www.marinetraffic.com/ais/). Although pile driving noise will at times reduce the effective river width through which sturgeon may move, it will not result in confinement to a narrow channel. As required by the Environmental Performance Commitments and the NYSDEC draft permit conditions there would always be a large cross section of the river that would not be ensonified during pile-driving activities, providing an adequate corridor through which sturgeon could move through without substantially increasing the likelihood of vessel strikes. Since the majority of vessel traffic will be located in the shallow construction access channel on the western side of the river, while migrating sturgeon will be concentrated in the deep water on the eastern side of the river, the potential for vessel strikes will be low. Given the deep-water habitat preference of sturgeon and the limited extent of the ensonified area created by pile-driving activities, any increase in vessel-related injury or mortality as a result of project activities would be "discountable."

C 18-61: The NYSDEC draft permit anticipates the number of shortnose sturgeon to be affected by the elevated noise levels to be 298, 89 of which may suffer mortality. These numbers are consistent with the Incidental Take Permit (ITP) report submitted to NYSDEC and the revised Biological Assessment (BA), both prepared by AKRF, Inc. in April 2012. AKRF's methodology in calculating the affected number of shortnose sturgeon is based on the encounter rate of sturgeon within the project area, obtained from AECOM's one year gillnet survey, and the SEL_{cum} noise levels at which injuries can occur. The gillnet survey provided a scaled encounter rate of .033 shortnose sturgeon per hour of sampling along with data showing that sturgeon typically move with or against the current. Since the sturgeon tend to move with or against the current, AKRF further scaled the gillnet encounter rate from one gillnet to the number of gillnets necessary to encompass the width of the isopleth of concern. The ITP and BA, prepared by AKRF, state that based on recent studies and discussions with the NMFS, the SEL_{cum} levels at which injuries can occur are 197 dB re 1µPa2·s for potential recoverable physical injury and 207 dB re 1µPa2·s for potential mortal injury. AKRF estimates the number of shortnose sturgeon affected as a result of pile driving by assessing the amount of fish each driven pile will affect. AKRF anticipates 298 shortnose sturgeon to be affected, 89 of which may suffer mortality, based on SEL_{cum} sound levels.

The NMFS, in the June 22, 2012 BO, anticipates the number of shortnose sturgeon to be affected by the increased noise level to be 43-70 (depending on the Long Span or Short Span Options, respectively), one of which may suffer mortality. NMFS uses the same methodology as AKRF in the ITP with one major difference; the noise criteria for the onset of physiological effects. NMFS uses a peak sound level of 206 dB re 1µPa, rather than a SEL_{cum} sound level, as their criteria for potential physiological effects to occur within sturgeon. The difference in criteria is based on NMFS' assumption that the shortnose sturgeon will not remain in the ensonified area for more than a few minutes. The different criteria results in a decreased number of sturgeon because the new isopleth (peak 206 dB re 1µPa) has a smaller width; thus, needing less gillnets to span it. NMFS also states that because they expect the shortnose sturgeon to leave the ensonified area during pile driving activities, they do not expect any deaths. However, NMFS stated they must account for the unexpected, resulting in their estimated death of one sturgeon.

It is unclear as to why after discussions between NMFS and AKRF, the ITP and BO use radically different criteria in assessing the amount of affected shortnose sturgeon. The noise level at which physiological effects occur within shortnose sturgeon is obviously unknown and needs to be investigated further. (Huddleston)

R 18-61: The ITP and AKRF's Biological Assessment were submitted to NYSDEC and NMFS, respectively, in April 2012 and presented an impact analysis based on the cumulative sound exposure (SEL_{cum}) criterion. In the BO, NMFS stated that it was not a reasonable expectation for sturgeon to remain

in the ensonified region for the entire duration of the pile-driving activities because they would respond behaviorally by avoiding the noise stimulus. Under these circumstances, NMFS reasoned that the SEL_{cum} was not the most appropriate criterion to apply and opted for the peak criterion of 206 dB re 1µPa SPL. An examination of acoustic-tagged sturgeon during the PIDP found that sturgeon spent substantially less time in the vicinity of test piles (i.e. the tag-detection area) during active pile driving compared to the time period before pile driving. Given the small size of the ensonified areas created during the PIDP relative to the much larger tag-detection area, it is unlikely that detected sturgeon were in the ensonified area over the entire period in which the pile was driven. Therefore, the PIDP analysis supports the use of the peak criterion in assessing the effects of pile driving on sturgeon for the Tappan Zee Hudson River Crossing Project.

According to Dr. Popper and as others have demonstrated (e.g., Carlson et al. 2007; Halvorsen et al. 2012a, b,), the sound levels at which fish would be affected appear to be much higher than the conservative levels used to assess potential noise impacts relative to the peak and cumulative criteria. Furthermore, the PIDP results (JASCO 2012) indicate that the sizes of the ensonifed areas will be considerably smaller than those used in the analyses of pile-driving impacts for the ITP and BA. Smaller than predicted ensonified areas during the PIDP resulted from noise attenuation from construction barges that encircled the pile during pile driving, higher than predicted noise attenuation by BMPs (12.2 to 17.0 dB re 1µPa peak SPL), and much greater use of the vibratory hammer than expected. As a result, the BA and ITP overestimated the potential impacts of pile-driving effects on sturgeon.

The assertion that “the noise level at which physiological effects occur in sturgeon is “obviously unknown” is simply not correct. First, West Coast interim noise criteria have been established that provide a conservative threshold for the onset of physiological effects to all fishes, including shortnose and Atlantic sturgeon. Second, Dr. Popper and others have published several articles in the scientific literature that quantify levels of physiological effects and mortality and indicate that the onset of physiological effects occurs at much higher levels than the West Coast criteria (e.g., Carlson et al. 2007; Halvorsen et al. 2012 a, b,). Third, the auditory physiology of sturgeon is similar to that of other hearing generalists indicating that sturgeon are basically low frequency hearing animals with small swim bladders, which makes them less susceptible to noise impacts than hearing specialists and fish species with larger swim bladders. Finally, the onset of physiological effects for larger fish of the size of sturgeon likely to be found in the Tappan Zee region, would occur at much higher sound levels than those used as West Coast interim noise criteria.

C 18-62: The NYSDEC draft permit anticipates the number of Atlantic sturgeon to be affected by the elevated noise levels to be 125, 52 of which may suffer mortality. These numbers do not directly correspond to those found within the AKRF produced ITP and revised BA reports; however, the Draft NYSDEC Permit uses Atlantic sturgeon numbers taken from the data found

within AKRF's April 2012 documents. The method employed by AKRF to determine the amount of Atlantic sturgeon affected consists of four steps: 1) Determine the efficiency of the gear used in the Fall Shoals Program (FSP) for catching juvenile Atlantic sturgeon 2) Develop a population estimate for juvenile Atlantic sturgeon 3) Estimate abundance of juvenile Atlantic sturgeon in the ensonified area 4) Estimate abundance of adult Atlantic sturgeon in the ensonified area. AKRF produced numbers for both the Short and Long Span bridge Options and for both juvenile and adult sturgeon. It is from these numbers that the NYSDEC obtained the amount of Atlantic sturgeon they expected to be affected by the pile driving operations.

There is a major issue with the NYSDEC obtaining the amount of Atlantic sturgeon they expect to be affected by the pile driving operations from AKRF's analysis. In the BO, NMFS details the method that AKRF used, points out multiple errors and clearly states that the estimates provided in the BA (and thus the ITP) cannot be relied on. The BO acknowledges that the basis for the entire method, the assumption that gear selectivity for juvenile Atlantic sturgeon can be obtained from shortnose sturgeon data, cannot be validated. The BO further states that the numbers produced by AKRF for affected adult sturgeon are likely an underestimate. NYSDEC's use of AKRF's data for the draft Incidental Take statement is unjustified. The NYSDEC must reevaluate the number of Atlantic sturgeon expected to be affected with a methodology that relies not only on AKRF's limited gillnet survey, but also on the extensive sampling and tracking studies the USFWS and NYSDEC has performed and gathered for federally endangered Atlantic sturgeon populations over the last 9 years.

The NMFS, in the June 22, 2012 BO, anticipates the number of Atlantic sturgeon to be affected by the increased noise level to be 43-70 (depending on the Long or Short Span Options, respectively), one of which may suffer mortality. These numbers were obtained directly from the shortnose sturgeon calculations and are an estimate of the maximum amount of Atlantic sturgeon NMFS expects to be affected. This is based on the assumption that there are less Atlantic sturgeon within the project area than there are shortnose sturgeon. Furthermore, the NMFS assumes that the one possible death would be that of a juvenile Atlantic sturgeon rather that an adult because the potential for mortal injury from noise exposure decreases as fish size increases.

The methods employed by both AKRF and NMFS and subsequently relied on by NYSDEC to estimate impacts to both Atlantic and shortnose sturgeon suffer from a lack of consensus regarding methodology and efficient use of available historical data. A reevaluation using methodologies bolstered by historical USFWS and NYSDEC sturgeon population data coupled with definitive, long-term research regarding localized acoustical impacts from pile driving must be completed to fully assess and understand the impacts that the project will have on the federally endangered Atlantic and shortnose sturgeon. (Huddleston)

R 18-62: It should be noted that the commenter neither identifies the specific data sets nor the methodologies to be employed in any further requested analysis. The commenter incorrectly asserts that the methods employed to estimate sturgeon impacts "suffer from a lack of consensus regarding methodology and efficient use of available historical data." In fact, the analytical methods used to estimate the number of shortnose and Atlantic sturgeon potentially impacted by pile-driving noise took advantage of the best available data for each species and life stage.

There are several data sources available that quantify sturgeon occurrence and abundance in the Hudson River. However, the period of record, geographic extent, level of sampling effort, and species targeted vary among data sources. Two of the available data sources were considered to be the most appropriate for developing sturgeon estimates: 1) AECOM gill net data, and 2) Utility Fall Shoals trawl data. Tagging data collected by NYSDEC on Atlantic sturgeon were considered in the FEIS and indicated that the project area is primarily a migration corridor for adult Atlantic sturgeon. It is assumed that the USFWS studies mentioned in the comment refer to data collected by Sweka et al. (2007). These data are high quality and they were reviewed for the FEIS, but they were not used in the impact analyses as the data were collected in Newburgh and Haverstraw Bays and are not representative of the project area or even the Tappan Zee region. Other USFWS tagging data for Atlantic sturgeon in the Hudson River are not known. The agencies that reviewed the analyses of potential noise impacts were satisfied with the use of the historical and current data relied upon and did not recommend additional datasets to be used in any revised analyses.

In the case of shortnose sturgeon, the AECOM gill-net survey targeted the project area at the Tappan Zee Bridge, while the Utilities Fall Shoals survey was a river-wide effort with a number of collections taken in the Tappan Zee region. Therefore, the AECOM gill-net dataset was selected as the best available for shortnose sturgeon. Because the gill net is a passive sampling gear, it was necessary to estimate encounter rate as the number of sturgeon collected per unit of sampling effort (i.e., length of net and hours of sampling). This encounter rate was then applied as a function of the number of gill nets required to span the ensonified areas created during pile driving to produce an estimate of the potential number of sturgeon.

No Atlantic sturgeon were collected by the gill nets. The Atlantic sturgeon analysis for NYSDEC did not use the AECOM gill-net data as stated in the comment, but rather relied on ten years of Utilities Fall Shoals beam-trawl data collected throughout the Hudson River from Albany to the Battery and included approximately 2,400 samples collected in the Tappan Zee region. Analyses based on the Utilities data were presented in the BA and the ITP and provided an estimate of juvenile Atlantic sturgeon as a function of their density in the Tappan Zee region and the ensonified volumes created during pile driving. Because adult Atlantic sturgeon were not collected in Utilities trawls, the estimate for adults was based on the most recent estimate of the adult population size provided by NYSDEC (Kahnle et al. 2007) and life-

history information on the spawning interval (adult sturgeon do not spawn every year; Bain 1997 and references therein).

Analyses for both species assessed potential noise impacts relative to the SEL_{cum} criterion and used the best available datasets for each species and life stage. It was after NMFS stated that the SEL_{cum} criterion was not the most appropriate metric to use for this project that the sturgeon estimates were recalculated using the peak SPL criterion. Both criteria provide an estimate of potential impact to sturgeon, but each criterion addresses a specific aspect of noise exposure. On one hand, the SEL_{cum} criterion provides an estimate of long-term exposure; while on the other hand, the peak SPL criterion provides an estimate of near instantaneous impact resulting from exposure to a single pile strike at close range. Differences in sturgeon estimates identified in the comment are a result of the area ensonified by the SEL_{cum} (larger) vs. the peak SPL (smaller) and do not represent a "lack of consensus".

NMFS did not point out "multiple errors," but rather indicated that some of the assumptions made in deriving sturgeon estimates were not verifiable or difficult to validate (i.e., gear-efficiency, spawning interval for adult Atlantic sturgeon).

Although perhaps not readily obvious, the number of Atlantic sturgeon that NYSDEC expected to be affected by the elevated noise levels are in fact those reported in the BA and the ITP (i.e., 125 injured and 52 which may suffer mortality). These values represent the sum of the maximum number of juveniles (i.e., 116 injuries, 50 mortalities) and the median number of adults in the range (i.e., 9 injuries, 2 mortalities) presented in Table 7 of the BA and ITP.

Despite the difference in allowable take between the NMFS BO and the NYSDEC draft permit, neither take number would result in any jeopardy to either species or prevent the conservation of sturgeon populations. Furthermore, the project would provide a net conservation benefit.

C 18-63: The PIDP prepared by JASCO Applied Sciences documents the identification of 195 tagged fish within the immediate vicinity of the demonstration project. 126 of the 195 identified tagged fish were confirmed sturgeon species (65%). JASCO fails to specifically identify whether they are Atlantic or shortnose sturgeon. Of the four hydroacoustic monitoring stations deployed, only three were recovered from the demonstration study. Of the three recovered stations, #6 and #7, located on either side of the deep navigation channel, had the highest number of tagged sturgeon present during the month long study (April 28 through May 18, 2012). The 185 tagged fish identified at Station #6 were detected 15,838 times over the course of the one month study period. The 187 tagged fish identified at station #7 were detected 20,418 times over the course of the one month study period. During the one year gillnet survey, conducted by AECOM, a total of only 12 shortnose sturgeon were captured in the vicinity of the bridge. The FEIS must account for the huge discrepancy between the

JASCO PIDP report issued in July 2012 (126 sturgeon), based on one month of study, and the observed AECOM gillnet study results (12 shortnose sturgeon/no Atlantic sturgeon), based on one year of study. It must also be noted that none of the reports issued to date have been revised to reflect the JASCO sturgeon data including the Biological Assessment, the Incidental Take Permit, and the Biological Opinion all of which rely on AECOM's gillnet data to determine the amount of sturgeon expected to be affected from the pile driving operations. (Huddleston)

R 18-63: Contrary to the assertion of a "huge discrepancy between the JASCO PIDP report issued in July 2012 (126 sturgeon) and the AECOM gillnet study results (12 shortnose sturgeon/no Atlantic sturgeon)", the abundance estimates are in fact similar when properly accounting for the level of sampling effort. The reason for the difference in the number of sturgeon reported in the PIDP report and the AECOM report is related to the difference in sampling gear and effort (i.e., area sampled, number of hours sampled) between acoustic receivers and gill nets. Sturgeon abundances can not be directly compared without first correcting for sampling differences between surveys.

Despite sampling over different time periods, both surveys expended similar effort in terms of the number of hours sampled (679 hours vs. 636 hours). However, the acoustic survey sampled a larger spatial extent (approximate diameter of the receiver detection area = 3,281 feet) than the gill-net survey (net length = 125 feet). To account for these differences, sturgeon abundance were scaled as follows:

Gill-net sampling produced an abundance estimate of:

0.03 sturgeon per net per hour = (12 sturgeon / 1 gill net / 679 hours / 0.6 to correct for sampling of sturgeon by only 3 of the 5 panels).

Acoustic sampling produced an abundance estimate of:

0.02 sturgeon per net per hour = (159 sturgeon / 26 gill nets to span the detection area / 636 hours / 0.6 correction).

Therefore, although acoustic sampling during the PIDP at first glance may appear to indicate considerably higher abundances over a much shorter time period compared to AECOM gill-net sampling, the abundance estimates are in fact similar (**0.03 vs. 0.02 sturgeon per net per hour**) when the level of sampling effort is accounted for.

Data on acoustic-tagged sturgeon collected during the PIDP were unavailable for the analyses conducted as part of the EIS, BA and ITP. However, an examination of acoustic-tagged sturgeon during the PIDP found that sturgeon spent significantly less time in the vicinity of test piles (i.e., the tag-detection area) during active pile driving compared to the time period before pile driving. Given the small size of the ensonified areas created during the PIDP relative to the much larger tag-detection area, it is unlikely that detected sturgeon were in the ensonified area over the entire period in which the pile was driven. These findings indicate that the peak

SPL criterion is the appropriate metric for evaluating noise impacts related to construction of the Tappan Zee Hudson River Crossing.

It should be recognized that the FEIS presents a worst-case analysis in terms of potential impact to sturgeon and other fish species. For the reasons amplified in Response 18-64 below, it is expected that noise impacts from pile driving will be considerably less than predicted in the FEIS, the ITP application, and the BA. Because the extent of compensatory mitigation and conservation efforts were predicated on the elevated numbers predicted in the FEIS and BA, the sturgeon take numbers will be less, and the net conservation benefit will be greater, than previously indicated.

C 18-64: Both the JASCO PIDP report and the FEIS responses to comments discuss the size reduction in isopleth intensity contours that were observed between modeled and actual PIDP results. The decrease in isopleth intensity was attributed to both noise attenuation systems (primarily bubble curtains) and the presence of barges almost completely surrounding the pile driving location. Both documents readily acknowledge that the presence of the barges with drafts ranging from 6-10 feet likely had a large impact on pile driving noise attenuation and subsequently isopleth intensity contour reduction as the depth of the water at the PIDP test sites ranged from 9 to 16 feet. However, the FEIS RTC does not elaborate on whether the actual pile driving for the bridge will utilize the same methodologies, so as to recreate the noise attenuation provided by the barges. The FEIS must verify that the same procedures that resulted in reduced isopleth intensities during the PIDP will be utilized during actual bridge construction (i.e. ringing the pile driving locations with barges) so as to limit the predicted impacts to sturgeon and other fish species from elevated noise levels. (Huddleston)

R 18-64: Noise impacts were modeled in the DEIS and FEIS using a number of conservative assumptions to ensure that these impacts were not underestimated. It was assumed that impact hammers would be used for all pile driving and that noise attenuation of 10dB would be in place. Results of the PIDP indicate that additional noise reduction will result from the presence of the construction barges used to install piles. The FEIS indicates that for construction of the vast majority of the bridge (Zones B and C), barges will be positioned around the pile-driving locations in a manner similar to the PIDP. In addition to noise reductions provided by the barges, the PIDP also demonstrated that the use of bubble curtain BMPs provided greater noise attenuation (up to 17.0 dB) than the 10dB reduction used in the models to predict hydroacoustic impacts. Furthermore, vibratory hammers will be used to a much greater extent than initially expected, which will further reduce noise impacts compared to the modeled impacts. Finally, many of the piles to be installed in soft sediments are likely to settle under their own weight prior to the start of pile driving, which will reduce the amount of time over which pile driving will be required. As a result of this new information gained during the PIDP, it is expected that noise impacts from pile driving will be considerably less than that predicted in the FEIS, ITP application and BA.

C 18-65: Fast track review of this Project at the federal level has not allowed for a proper analysis of all the immediate, long-term, and cumulative impacts of this Project. For example, the FEIS includes a discussion about the alternatives to dredging, as Riverkeeper requested in its comments on the DEIS; however, the explanation provided for why the alternatives to dredging have been dismissed is very brief and still does not fully weigh the costs and benefits of these dredging alternatives. As Riverkeeper stressed in its comments on the DEIS, the harmful effects of performing dredging in this area of the Hudson River are extensive. Dredging will cause disturbances to the endangered shortnose and Atlantic sturgeon, the loss of benthic macroinvertebrates and their habitat, and the resuspension of PCBs, metals, and other hazardous materials located in the river sediments. The FEIS fails to fully consider these impacts, or to fully examine measures to avoid them or mitigate them if necessary. For example, the use of a full length trestle platform, as an alternative to dredging, has been dismissed because the lead agencies have found it would be too expensive to install the pile foundations of a trestle, due to the soil conditions in this area of the River. However, these monetary costs have not been weighed against the environmental costs of performing extensive dredging. A proper review process should fully take into consideration the costs and benefits of different project alternatives. Simply dismissing an alternative to dredging because of the projected costs, without simultaneously considering the countervailing environmental impacts or benefits, does not constitute a proper environmental review. (Musegaas and Verleun)

R 18-65: In response to this comment, a further elaboration on the discussion of a construction access trestle alternative included in the FEIS, that would avoid dredging, is provided. The analysis that led to the elimination of the trestle alternative from further consideration found that it would be uneconomical, impractical from an engineering perspective, would reduce some river impacts but increase others, and would increase noise and air quality impacts to the nearby communities.

The discussion in the FEIS presented a cost analysis that concluded that a trestle alternative would likely cost up to three times more than a dredged channel alternative. It should be noted that the cost analysis was quite conservative in that it considered only those aspects of the trestle alternative that were most favorable, neglecting other aspects that were less favorable such as the increased costs from the limitation of the use of large equipment in the construction and demolition process as discussed below.

A construction trestle over 4 miles in total length is by itself an estimated $366 million construction project taking 18 months to complete, with impacts that typically attend a project of that scale. As already noted in the FEIS, the length of trestle needed for this project and the poor soil conditions are two of the primary engineering reasons that a trestle alternative is poorly suited for this project. In particular, a trestle alternative would require installing and removing over 7,000 temporary piles just for the construction trestle, far more in number than required to support the permanent replacement bridge.

However, the most significant drawbacks of the trestle alternative are that it: a) changes the construction and demolition approach from one staged largely from the water to one staged largely from land, with all of the inherent increases in adverse impacts to the surrounding residential communities; and b) it places significant constraints on the size of equipment that can be used for construction and, more importantly, for demolition.

Despite its temporary disruption to riverbed habitat, the dredged channel alternative effectively minimizes the adverse impacts to the residential communities. As currently planned, most of the construction material would be delivered by barge and construction and demolition debris would be removed in a similar manner. This would minimize the adverse effects of heavy-duty diesel truck traffic on the Thruway and through residential communities. This advantage could be lost if a trestle alternative were used.

The size of equipment (particularly cranes) that can be used on a trestle is limited by the design strength of the trestle. In this case, the design strength is controlled by the soil conditions. The proposed trestle could accommodate 150- to 300-ton capacity cranes, which would be sufficient to install the sizes of piles assumed in the EIS. However, it would not be of sufficient strength to erect large, pre-assembled superstructure units, or to lift out large sections of the existing superstructure as envisioned by the FEIS construction methods. Even using two smaller cranes at a time, lifts of that size are beyond what can be done from a temporary trestle. This would place a significant constraint on the construction and demolition methods that the Design-Builder could employ. Constraints that significantly limit means and methods will increase the project cost appreciably.

Since trestles are constructed from the shore outward, all of the materials for the trestles would have to be delivered overland by truck to the riverfront. The piles would either be transported by truck in shorter lengths and welded together on site, or trucked as single pieces requiring over-length permits, using specialized hauling equipment. An estimated total of 4,500 to 6,000 truckloads would be required just for the trestle material alone.

Overland hauling of the larger diameter, longer piles, the approach girders, and large precast concrete elements for the permanent bridge pre-assembled would be difficult. Two methods of transporting this material would be possible.

The first possibility is that the Design-Builder could bring the large, precast and pre-assembled pieces in by barge. To do so, it would be necessary to construct large receiving platforms at the end of the trestles in deep water, creating what would amount to a small port operation. The permanent piles, girders, precast concrete units etc. would have to be transferred from the barges to dollies on the trestles and pulled by tractor to the pier locations, a slow process that would lengthen construction time. These receiving and staging platforms would be in addition to the receiving and staging platforms already envisioned near the shores for overland deliveries and storage. The

additional receiving platforms would add roughly 400 piles and 6 acres to the trestle totals.

The second possibility is that the Design-Builder could alter its approach to: a) transport smaller units overland by truck and assemble them into larger units on site, and b) increase the use of cast-in-place concrete using ready-mix concrete transported by mixer trucks in place of entirely precast units. This approach would greatly increase the amount of permanent material that would arrive by truck, including over-sized loads that would require temporary lane or road closures throughout the construction period. It would also increase the amount of construction activity at the WBSA and RBSA if the units were assembled on site.

If a Design-Builder were required to use a trestle alternative, it would naturally use the trestle to its best advantage for expeditious construction, so overland delivery directly onto the trestle by truck would be the Design-Builder's preferred approach. It is estimated that between 20,000 and 25,000 additional truckloads would be needed above the number that would be required using a water-based approach over the construction period. Not only would truck traffic increase enormously, but many oversized loads would need to be delivered to the waterfront staging platforms. These over-sized loads would most likely require modifications to some intersections to allow proper turning radii for these truck units. In addition, frequent lane and road closures to move this equipment and material from the Thruway to waterfront staging platforms would be required, particularly at night. This would substantially increase noise levels at night, most likely surpassing the maximum allowable noise level criteria set forth in the FEIS for night-time activities.

Demolition of the existing bridge would have to be done from the trestles as well. The demolished material would be removed from the site the same way that construction material would be delivered. If done by water, much of the demolition material would have to be trucked along the trestles to the deep water receiving platforms and transferred to barges (the main spans will in any alternative be removed directly by water). The double-handling involved would be slower than simply trucking it away directly overland. As with construction, the Design-Builder would be motivated to eliminate the slower double-handling and truck the demolition spoils overland. An estimated 8,000 to 10,000 truckloads would be required to remove all of the demolition spoils from the site under this alternative.

The trestle would place the greatest constraints on the demolition methods. Removal of the existing bridge would be far more difficult and slower to do from a trestle than from water-borne equipment. Under a dredged channel alternative, very large marine cranes (1,000 ton capacity or greater) could be used to remove large pieces of the existing bridge superstructure in single lifts, eliminating the need for temporary support towers in the water during demolition (temporary towers were used during the original construction of the bridge). This would be the most efficient method. In the trestle alternative, temporary support bents would be needed between the piers of

the deck truss spans so that the trusses could be cut into smaller units and lifted out using cranes on the trestles, similar to the method used to originally erect them. The temporary support bents would be needed for relatively short periods, and could be re-used at multiple locations.

The finger trestles for construction of the new bridge would be in the wrong positions for demolition of the existing bridge. Therefore, additional temporary finger trestles would have to be added during demolition. These would be needed for relatively short periods, and could be re-used at multiple locations.

Between the demolition finger trestles and temporary support bents, an additional 2,000 pile installations and removals would be required, with an additional 1,300 to 1,700 truckloads to deliver the material.

It would take approximately 18 months to complete the construction trestles. While some foundation work for the main span could begin before the trestles were completed, the long lead time to construct the trestles would lengthen the overall construction schedule by at least 6 months and probably longer if the same restrictions for pile driving are placed on the trestle construction as are proposed for the bridge construction. As noted in the FEIS, construction of pile caps, piers and pier caps from a trestle would be faster than from barges. This advantage was included in the FEIS as a cost credit for the trestle alternative. The lengthening of the overall construction schedule was not considered in the FEIS; however, it should be noted for a more balanced assessment. The net schedule result would be a small increase in total construction time, likely on the order of three to four months.

While eliminating the dredging operations, the local communities would be faced with a nearly ten-fold increase in pile driving activities as well as what is essentially the construction and eventual demolition of a four mile long temporary bridge and other temporary support bents. The construction and demolition of this structure has air quality and noise considerations of itself by increasing the time and number of pieces of equipment required at the site. Moreover, the construction process would involve a lot of material moving back and forth along the temporary structure that would be avoided under the dredged channel alternative.

There would also be the potential for additional environmental impacts to Hudson River resources associated with the trestle alternative. The 7,000+ construction trestle piles would result in the loss of about 0.5 acres of benthic habitat. Accounting for shorter duration demolition piles, this would increase to 0.65 acres; accounting for the option of deep-water receiving platforms, this would increase to 0.7 acres. While it is anticipated that these piles would be vibrated in for much of their lengths, some amount of driving with an impact hammer would be required to seat the piles firmly on rock and possibly to advance the longer piles in soil to their final depths. Because barges would not be used as a platform to drive the temporary trestle piles and the permanent bridge piles, any attenuation of sound gained by the

presence of the barges (an advantage captured during the PIDP) would be lost and the potential for hydroacoustic effects associated with pile driving would be increased. The closely spaced piles would also have the potential to affect erosion and sedimentation patterns in the vicinity of the trestle. Lastly, the construction trestles and finger piers would shade an additional 21 acres or more of aquatic habitat throughout the construction period. The shorter duration demolition finger piers would add 5 more acres, and, if used, the deep water receiving platforms would add 4 more acres for a total of 30 acres.

In addition, the trestle would also have a negative impact on the area's use by recreational boaters for a period of roughly six years since it would completely block river access accept for the navigation channel.

Table A-1 below summarizes the number of temporary piles to be installed and removed, and the number of acres of habitat shading associated with the trestle alternative. **Table A-2** summarizes the number of additional truckloads over and above the number that would be required for a dredged channel option.

Table A-1
Number of Temporary Piles and Area of Shading Associated with Trestle Alternative

	Number of Piles	Area of Shading (acres)
Construction trestle	7,000	21
Demolition trestle and temporary bents	2,000	5
Total	**9,000**	**26**
Deep water receiving platforms option	400	4
Total with option	**9,400**	**30**

Table A-2
Additional Truckloads Associated with Trestle Alternative

	Number of Truckloads
Construction trestles	4,500 – 6,000
Construction of Crossing	20,000 – 25,000
Demolition trestles	1,300 – 1,700
Removal of existing bridge	8,000 – 10,000
Removal of trestles	5,800 – 7,700
Total	**39,600 – 50,400**

The FEIS evaluated the potential environmental impacts to water quality due to dredging and other in-water construction activities. The results of the hydrodynamic modeling of changes in suspended sediment resulting from in-water construction activities indicate that with the exception of the portion

of the mixing zone within the immediate vicinity of the dredge, increases in suspended sediment would be minimal for the Replacement Bridge Alternative and would be within the natural range of variation of suspended sediment concentration within this portion of the river and would not result in adverse impacts to water quality of the Hudson River. The results of the evaluation of potential increases in water-column constituent concentrations resulting from sediment re-suspension during dredging indicate that dissolved water column concentrations of sediment contaminants would be expected to be below the Class SB aquatic standard at the edge of the 500-foot mixing zone. Therefore, the proposed project would be expected to comply with the conditions anticipated from the NYSDEC in its Section 401 water quality certification for the project and would not result in adverse impacts to the water quality of the Hudson River.

As has been confirmed by Dr. Robert Diaz of William and Mary, a nationally recognized expert on benthic ecology, dredging will remove benthic organisms, but the species in the Tappan Zee area are very tolerant to disturbance from variation in salinity, turbidity, and sediment instability, and will recover quickly (on the order of months). Species that inhabit these transitional waters between freshwater and marine systems are known to be tolerant with opportunistic life-history characteristics that favor rapid re-colonization and turnover. The benthic resource value of the area dredged in a given project year should start to recover shortly after armoring of the channel bottom. Being tolerant to sediment grain size, the species will recolonize both coarse and fine substrates. Benthic data from the project area identified distinct species assemblages associated with coarse-grained and fine-grained sediments that were dominated by the same species but differed in relative abundance of species between sediment types. After the armoring accumulates a thin layer of fine sediments (as little as 1-2 cm), it is likely that the channel resource value will be similar to the surrounding fine sediment bottom. While the EIS states that the benthos inhabit the top 10-12 cm of surface sediment, greater than 90% of the species and individuals are in the top 2-3 cm of sediments. It is the larger, long-lived clams, such as *Rangia* spp. and larger polychaete worms, such as *Neanthes* spp. that would occur deeper in the sediment. The majority of benthic species are small and live at the sediment-water interface and would occur in both the fine and coarse sediment environments. Furthermore, the project is providing compensatory mitigation for the removal of these benthic organisms even though the FEIS determined that the loss is temporary and the organisms will recover quickly and therefore the impact is not adverse.

In summary, the trestle alternative was eliminated from further consideration for the following reasons: a) it would cost at least three times as much as the dredged channel alterative; b) the length of the trestles and the poor soil conditions make a trestle an uneconomical and inefficient change in the construction and demolition from a water-based approach to a land-based approach, adding up to 50,000 additional truckloads over and above the number that would be required with a dredged channel alternative in which most materials would be delivered by water; d) it would place significant

constraints on construction and demolition methods, decreasing efficiency of the work and therefore increasing the overall cost; e) it would increase the air quality and noise impacts to the surrounding communities; f) it would increase the hydro-acoustic impacts to fish including the ESA species; and g) it would disturb up to 0.7 acres of river bottom habitat.

C 18-66: As discussed below, there are inconsistencies in the authorized sturgeon take between the BO and DEC draft permit that raise significant questions about the underlying scientific validity of the BO and DEC Draft Permit.

The BO found that the Project would adversely effect, but is not likely to jeopardize the continued existence of shortnose and Atlantic sturgeon. In analyzing the impacts of pile driving for the Project, NMFS anticipates the number of shortnose sturgeon and Atlantic sturgeon to be affected by the increased noise level to be 43-70 of each species (depending on the Long Span or Short Span Options, respectively), and estimates that one of each may suffer mortality. The BO also estimates one fatality for each species per year as the result of dredging. In the BO, NMFS issued a Take Statement authorizing the take of shortnose and Atlantic sturgeon in these numbers.

Less than 1 week prior to the release of the FEIS, the DEC issued the Draft Permit. The Draft Permit states in part that "It is estimated that approximately 125 Atlantic sturgeon and 298 shortnose sturgeon will be affected by elevated noise levels caused by pile driving during construction. Of these, as many as 52 Atlantic sturgeon and 89 shortnose sturgeon may suffer fatal injuries. The remaining incidental take will be in the form of non-lethal injury, disturbance or harassment." (Musegaas and Verleun)

R 18-66: The comment states that “there are inconsistencies in the authorized sturgeon take between the BO and DEC draft permit that raise significant questions about the underlying scientific validity of the BO and DEC Draft Permit.“ By “inconsistencies,” it is assumed that the commenter is referring to the difference in the sturgeon take estimates provided in the NMFS BO (e.g., 70) and the NYSDEC draft permit (e.g., 298). These differences do not cast doubt on the scientific validity of the analytical approaches used to produce the estimates, as suggested by the commenter. Rather, they reflect the different noise criteria chosen by NMFS (i.e., peak sound pressure level, SPL) and NYSDEC (cumulative sound exposure level, SEL_{cum}) to evaluate the potential number of sturgeon impacted by pile-driving noise.

However, despite the difference in allowable take between the NMFS BO and the NYSDEC draft permit, neither take number would result in any jeopardy to either species or prevent the conservation of sturgeon populations. Furthermore, the project would provide a net conservation benefit.

Both criteria (SEL_{cum} and peak SPL) provide a basis for estimating potential impact to sturgeon, but each criterion addresses a specific aspect of noise exposure. On one hand, the SEL_{cum} criterion provides an estimate of relatively long-term exposure, while on the other hand, the peak SPL

criterion provides an estimate of near instantaneous impact resulting from exposure to a single pile strike at close range. “Inconsistencies” in sturgeon estimates identified by the commenter are a result of differences in the area ensonified by the SEL_{cum} (larger) vs. the peak SPL (smaller) and the likelihood that sturgeon would encounter noise conditions that would lead to the onset of physiological effects. An examination of acoustic-tagged sturgeon during the PIDP found that sturgeon spent significantly less time in the vicinity of test piles (i.e. the tag-detection area) during active pile driving compared to the time period before pile driving. Given the small size of the ensonified areas created during the PIDP relative to the much larger tag-detection area, it is unlikely that detected sturgeon were in the ensonified area over the entire period in which the pile was driven. The PIDP analysis, therefore, supports the use of the peak criterion for assessing the effects of pile driving for the Tappan Zee Hudson River Crossing Project.

C 18-67: In Riverkeeper's comments on the DEIS we stated that the ASP and BA for endangered shortnose and Atlantic sturgeon were inadequate and relied on flawed scientific methodology that failed to accurately assess impacts to these species. Our concerns continued to hold for the revised BA dated April 2012. The subsequent release of the BO and DEC Draft Permit only added to River keeper's concerns, because they show vastly different take numbers, due to radically different methodologies and assumptions used by NMFS and DEC in their analyses. Both the NMFS and DEC analyses appear to rely on the same flawed baseline studies conducted by the state that underlie the original BA and revised BA. The FEIS' reliance on the NMFS BO conclusions, therefore, renders the FEIS' overall determination of impacts to sturgeon invalid and legally deficient. (Musegaas and Verleun)

R 18-67: As stated in the response to Comment 18-66, the difference in take numbers between the NMFS BO and the NYSDEC draft permit are a result of differences in the noise criteria used by the two agencies (i.e., cumulative sound exposure level vs. peak sound pressure level) to assess potential noise impacts rather than “radically different methodologies and assumptions” as asserted in the comment. Further explanation regarding the selection of the best available and most appropriate data and analytical approaches for estimating potential noise impacts to sturgeon is provided in the response to Comment 18-62.

NMFS has set the allowable take of Atlantic and shortnose sturgeon due to pile-driving and dredging operations at no more than 3 per species for capture by the dredge, 70 fish per species for injury due to hydroacoustic impacts, with allowable mortality of two fish of each species (one each for dredging and hydroacoustic operations), and has required trained observers to be present throughout dredging and pile-driving operations. By establishing very low take numbers, NMFS has clearly ensured the safety of the endangered sturgeon species as any exceedance of these take numbers would require re-initiation of consultation with NMFS. Despite the difference in allowable take between the NMFS BO and the NYSDEC draft permit, neither take number would result in any jeopardy to either species or prevent

the conservation of sturgeon populations. Furthermore, the project would provide a net conservation benefit.

C 18-68: As described in further detail in Riverkeeper's consultant's analyses, included herein as Exhibits 3 and 4, the NMFS BO assessment of impacts to shortnose and Atlantic sturgeon is deficient and potentially underestimates the number of both species of sturgeon that will be affected by this project. The deficiency of the BO results from, among other things, NMFS' use of flawed data regarding the numbers of sturgeon which may be present in the area during bridge construction, the lack of reliable information on noise impacts and sturgeon behavioral responses to underwater noise, lack of assessment of potential take from vessel strikes, and inadequate assessment of dredging impacts, both direct (direct take from dredging operations) and indirect (significant loss of foraging habitat). The different assessment and study methods employed by NMFS and DEC fail to agree on the proper methodology to use in determining baseline sturgeon data, and do not utilize available historical data on Atlantic and shortnose sturgeon from the United States Fish and Wildlife Service (USFWS) and DEC. As noted by Riverkeeper's consultant,

> The FEIS must account for the huge discrepancy between the JASCO PIDP report issued in July 2012 (126 sturgeon), based on one month of study, and the observed AECOM gillnet study results (12 shortnose sturgeon/no Atlantic sturgeon), based on one year of study. It must also be noted that none of the reports issued to date have been revised to reflect the JASCO sturgeon data including the Biological Assessment, the Incidental Take Permit, and the Biological Opinion all of which rely on AECOM's gillnet data to determine the amount of sturgeon expected to be affected from the pile driving operations. (Exhibit 4 at 2).

Long term research regarding the effects of the localized impacts of pile driving must be completed to fully assess and understand the impacts the Project will have on the federally endangered Atlantic and shortnose sturgeon. (Musegaas and Verleun)

R 18-68: Please see the response to Comment 18-62 for discussion of data used to assess potential noise impacts to sturgeon. Please see the responses to Comments 18-62, 18-63, 18-66, and 18-67 for discussion of differences in analytical methods and noise criteria. Please see the responses to Comments 18-57, 18-58, and 18-64 for discussion of potential noise impacts and sturgeon behavior. Please see the response to Comment 18-60 for discussion of vessel strikes. Please see the responses to Comments 18-52, 18-53 and 18-69 for discussion of potential dredging impacts.

C 18-69: The Fact Sheet prepared by NMFS to accompany the listing of Atlantic Sturgeon as Endangered, and the DEIS itself acknowledged that dredging is one of the primary threats to the New York Bight population. Given the

unprecedented scale of dredging and the lack of adequate study, the BO and FEIS' conclusions regarding the impacts of dredging are unsupported.

In addition, the significant loss of benthic habitat that would result from the dredging of a 500 foot wide channel across the Hudson River, and the impacts caused by the armoring of the dredged channel, have not been adequately assessed in the DEIS or FEIS, nor is there an explanation for why the natural river bottom will not be restored post-construction. The FEIS also does not address comments made by the USFWS on a draft of section 18 of the DEIS, which stated that "deposition of river sediments on top of an unnatural substrate is unlikely to mimic a natural river bottom ... the DEIS needs to clearly explain what the impacts of armoring will be and what loss of natural resources will result ... [so that] any short term impacts to natural resources are mitigated."

Minimization of dredging impacts, mitigation of any short term or long term impacts, and restoration of the habitat lost must all be fully addressed in a supplemental EIS. (Musegaas and Verleun)

R 18-69: NMFS determined in their BO that “the dredging footprint represents a very small percentage of the soft bottom habitat of the Tappan Zee region (1.2%) and the Hudson River Estuary (0.2%). Thus, the temporary reduction of benthic fauna within the dredged area would not substantially reduce foraging opportunities for the river's sturgeon populations.” Sturgeon would be expected to forage over coarse sediments. Atlantic and shortnose sturgeon are benthic omnivores that forage opportunistically. Although both sturgeon species frequently forage in fine sediments in the Hudson River (Sweka et al. 2007), they have been reported to occur most commonly over coarse sediments in other rivers (e.g., Connecticut, Merrimack) and in the Atlantic Ocean where they feed on benthic prey organisms (Kynard et al. 2000, Savoy and Pacileo 2003, Stein et al. 2004).

As presented in the FEIS and as confirmed by Dr. Diaz, recovery of benthic macroinvertebrates in the dredged area is dependent primarily upon salinity and secondarily upon substrate type (e.g., silt versus sand). Given acceptable levels of salinity, recolonization will begin within weeks to months of deposition of the coarse armoring substrate. It will only take a thin-layer of fine sediment to accumulate on the armoring to facilitate settlement of larvae. Also, in oligohaline transition zones the first colonizers tend to be adults that are swept in with suspended sediments from nearby areas. The species composition and density of the benthic community will be dynamic as the community shifts states from one initially dominated by adults of opportunistic species already present in the surrounding sediments to one of greater species diversity and dominated by larval propagules of the same and additional opportunistic species. This later stage of recolonization will be driven primarily by season, as many of the species exhibit seasonal peaks in reproduction, such as the polychaete worm *Strebilospio*. The constantly changing combination of salinity, turbidity, and sediment transport keeps the benthic community in oligohaline transition zones, such as the Tappan Zee area, in a constant state of dominance by opportunistic species. While the

majority of the bottom habitat and associated benthic macroinvertebrates within the area impacted by dredging is a soft sediment community, which also dominates much of the Upper and Lower New York Harbor and the Lower Hudson River, areas of gravel and hard substrate are present within the main channel and along the shorelines. These would serve as a source of hard-bottom species such as barnacles to colonize any of the very coarse capping material (pebbles and cobble grain sizes) until accumulation of soft sediments completely covers all of the armoring material. Therefore, while the substrate resulting from dredging and armoring would be a temporary change from the existing sediment condition, it would not be considered an unnatural bottom type within this section of the Hudson River. And given the high rate of sediment accumulation, the habitat should return to soft bottom after project completion.

Complete recovery to a soft bottom community would be dependent on a combination of the depth of redeposited sediment and the life-history strategies of the benthic invertebrates seasonally available to recolonize. For example, the small polychaete worm *Strebilospio* is present all year round in low numbers but populations only peak in the spring. In other salinity regions of the Hudson River, much of the benthic community is found within the upper 4 to 5 inches of sediment, but in the oligohaline region most of the community is with in the top inch of sediment. Thus redeposition on the order of 4 to 5 inches would more than provide sufficient substrate for restoration of a soft-bottom benthic community for any salinity regime the Tappan Zee area experiences. Sufficient soft sediment would be expected to be deposited within weeks to a few months of cessation of construction activities within a given area of the construction channel to allow for recovery of the benthic community. It is expected that recolonization will begin within days as adults are transported into the dredged area. The BO prepared by NMFS supports these findings and states, “benthic recovery should begin quickly, particularly in the soft bottom sediments.” NMFS goes on to state that the temporary loss of the access channel would represent a minor fraction of similar available habitat throughout the Tappan Zee region of the Hudson River and would not be expected to substantially reduce foraging opportunities for the river’s sturgeon populations. As discussed in FEIS, this temporary loss of benthic habitat within the construction access channel would be mitigated.

Because the deposition of soft sediment on top of the sand and gravel armoring material would occur upon cessation of construction activities in a given area, allowing restoration of a soft-bottom benthic community within a short period of time, the armoring material would not need to be removed following completion of the project. This would save the area from an additional disturbance and recolonization caused by channel restoration efforts, and would speed the natural recovery of benthic habitat value.

C 18-70: To construct the Project as proposed, it is anticipated that approximately 1.9 million cubic yards of sediment over approximately 175 acres of River bottom will be dredged to enable water access during construction and

demolition. This represents an extremely large impact to this area of the River – the most significant dredging project in the Hudson River since the navigation channel was dredged. The dredged area will be "armored" with approximately 400,000 cubic yards of sand and stone to prevent vessel prop wash from dispersing bottom sediment into the water column. This "armoring" will temporarily alter the benthic habitat in that 175 acres and not allow it to be immediately recolonized.

The National Marine Fisheries Service ("NMFS") has stated that "impacts associated with bridge construction and removal may adversely affect living aquatic resources and their habitats." Dredging will occur over a four-year period, so while the impact would be temporary, the scale of the dredging will significantly impact the benthic community and the aquatic species that rely on benthos for their food source. In addition, recovery from the dredging will take time, further prolonging the impact on the ecosystem. Sediment re-deposition in the dredged areas is very unlikely to take place as quickly as contemplated in the FEIS. The FEIS states that deposition within the dredged channel will occur at the rate of about one foot per year.[4] Data from other projects in nearby areas of the Hudson River indicate that the deposition rate would be far less – on the order of one or two inches per year. Given this information, recolonization will likely take many years and the scar to the floor of the River caused by the dredging will represent a long-term impact to the habitat. (Carlock)

R 18-70: Please see the responses to Comments 18-52, 18-53 and 18-69 which address the level of impacts caused by dredging. The statement that "recolonization will take many years" is simply not true. The estimated deposition rate of 1 foot per year presented in the FEIS was predicted on the basis of the modeling described in Chapter 18 and Appendix E. While others have reported lower (or comparable) sediment deposition rates of a few inches per year in the Hudson River and New York Harbor, recolonization by benthic invertebrates adapted to softer sediment would be expected to begin within a few weeks to months after completion of dredging. However, even at lower deposition rates, sufficient soft sediment (1 to 2 cm of sediment) would be expected to be deposited within months of cessation of construction activities within a given area of the construction channel to allow for adult and larval colonization of the benthic community to begin. The benthic community found within the Tappan Zee region exists in the upper 4 inches of sediment with 90 percent of the species occurring in the upper inch. Therefore, redeposition on the order of 1 to 2 inches would provide sufficient substrate to initiate restoration of a soft-bottom benthic community and its resource value to fishes. As presented in the FEIS and the response to Comment 18-69, prior to the deposition of sufficient sediment to support a soft substrate benthic invertebrate community, some recolonization of the very coarse armor material would be expected to occur by adults of epifaunal species, such as amphipods, from the nearby hard substrates serving as the source of colonizing organisms. Depending on the season, barnacle recruitment would also occur. Peak recruitment times for barnacles would be Spring and Fall.

Although the area affected by dredging is substantial, the overall impacts to the soft sediment habitat, which is the dominant sediment type in the lower estuary, will be temporary and given the specialized nature of the life histories of the species that inhabit this transitional zone, which are perfectly tuned to dealing with salinity and sediment disturbance, the chances of a long-term adverse impact are very small. As discussed in the response to Comment 18-69, the BO prepared by NMFS supports these findings and states, "benthic recovery should begin quickly, particularly in the soft bottom sediments."

C 18-71: Benthic species (including 6 EFH species) will be especially vulnerable due to the impacts of the proposed dredging and armoring, which are quite extensive. Further, while the benthic community may recover quickly after construction is completed, there is no data to suggest that the aquatic species that prey on the benthic organisms will return equally quickly. (Carlock)

R 18-71: Of those six EFH species that occur within the vicinity of the existing bridge, the three benthic species (i.e., summer flounder, windowpane and winter flounder) are more likely to be affected. Juveniles of these species feed on benthic organisms while they occur in the nursery habitats of the Hudson River estuary, but are not likely to be affected by the temporary loss of habitat caused by dredging, primarily because of their opportunistic feeding habits which allow them to utilize a range of substrates and food types. Juvenile summer flounder are often more abundant over sand substrates than over mud and silt substrates although they will utilize a wide range of substrate types and would be expected to forage over coarse and fine substrates in the Hudson River (Packer et al. 1999). Juvenile windowpane are more commonly collected in deep areas (>7m) and are therefore less likely to occur in the construction channel (<5m depth) than in the undredged river channel (Chang et al. 1999). Winter flounder are more commonly found over fine substrates (Pereira et al 1999), which are extensive in the Tappan Zee region. Dredging of the construction channel would affect only 1.1-1.2% of the benthic area and 1.2-1.3% of the soft sediments in the Tappan Zee region, as discussed in the BA. The remaining 98% of the benthic habitat in the Tappan Zee region would be unaffected by dredging activities related to the construction channel. Most importantly, these fishes are highly mobile, forage over large areas, and are capable of locating suitable foraging areas when food availability is limited in one area. Similarly, benthic fishes are not necessarily restricted to one particular type of sediment or food source when foraging and may continue to forage in the dredged and armored area during construction.

Please see responses to Comments 18-52, 18-53, and 18-69 for further discussion of the potential impacts of dredging to benthic species and Appendix F-3 (EFH Assessment) of the FEIS for more detail on the potential impacts of dredging and armoring to EFH species.

C 18-72: The method of disposal of the dredge spoils remains an open question, as the ultimate decision of how to transport and dispose of dredge spoils is left up to the contractor. The preferred plan is to place this fill in the Historic Area Remediation Site (HARS). However, disposal at the HARS requires an Army Corps of Engineers permit and the sediments must meet certain criteria related to toxic materials. It is far from clear that the sediments from the Tappan Zee area would meet the necessary toxic criteria. If the permit application for use of HARS is denied, the contractor would have to determine another place to dispose of the dredged material, and this possibility is not evaluated any further in the FEIS. Given that it could be potentially difficult to find a location to dispose of the dredge spoils, and that this could carry with it significant environmental impacts of its own, the potential for other disposal methods must be evaluated. (Carlock)

R 18-72: As presented in the FEIS, the USACE and USEPA determined the dredged material to be suitable for placement in the HARS on June 22, 2012. USACE issued a Public Notice (NAN-2012-0090-WSC) for the Section 103 permit on July 31, 2012.

C 18-73: In addition to the long-term impacts resulting from construction of the bridge, there will be a permanent loss of up to 13 acres of oyster habitat, as well as shading associated with the new bridge structure. In addition, some wetlands will also suffer permanent damage and there will be a permanent loss of vegetation along the shoreline. (Carlock)

R 18-73: Please see the response to Comment 18-51, which addresses mitigation for loss of oyster habitat. The potential impacts of shading associated with new bridge structure are addressed in Chapter 16, “Ecology,” and Chapter 18, “Construction Impacts,” of the FEIS. Mitigation for these impacts is identified in the FEIS. Temporary impacts to tidal wetlands are expected to be minimal and no permanent loss of tidal wetlands is expected, as discussed in Chapter 18, “Construction Impacts,” of the FEIS and summarized in Table 18-31. Construction activities are not expected to result in any permanent loss of vegetation along the shoreline. As discussed in Chapter 18, the shoreline areas near the proposed bridge site are impacted by adjacent development and are heavily engineered, possessing limited shoreline vegetation.

C 18-74: Finally, it is possible to construct the span without any dredging at all, by using construction trestles. While using the trestles would result in a net cost of $263 million over the dredging alternative, the reduction in impacts to benthic habitat would be enormous. This non-dredging option should remain on the table, and a more robust comparison of the environmental impacts of dredging 1.9 million cubic yards of sediment versus the increased number of piles needed for the trestle option should be conducted. (Carlock)

R 18-74: See the response to Comment 18-65, which comprehensively addresses the trestle alternative.

C 18-75: The discrepancy between the draft state and federal Incidental Take Permits is startling in its magnitude and must be resolved. While the fatality of 4 sturgeon may not result in jeopardy to the species, the fatality of 141 sturgeon – and particularly of 52 Atlantic sturgeon, given the Hudson River population's perilous state – would represent a very detrimental loss, from which the Hudson River population may not be able to recover. (Carlock)

R 18-75: The discrepancy in the federal and state estimates is explained in responses to Comments 18-62 and 18-66 above. Furthermore, as indicated in responses to Comments 18-63 and 18-64, the impacts to sturgeon due to pile driving that were presented in the FEIS and BA are likely to be overestimated. Despite the difference in allowable take between the NMFS BO and the NYSDEC draft permit, neither number would result in any jeopardy to the species or prevent conservation of sturgeon populations. Furthermore, the project will provide a net conservation benefit.

C 18-76: The deeper water habitat created by the trench may actually attract sturgeon to the project area during construction, therefore increasing the chance of injury and mortality. (Carlock)

R 18-76: Atlantic and shortnose sturgeon are typically associated with deep-water habitat. In the Tappan Zee region, acoustic-tagged Atlantic and shortnose sturgeon were detected during the PIDP in waters from 15-50 feet deep. Similarly, the majority of sturgeon collected from Utilities Fall Shoals trawl samples were reported from benthic habitats at depths greater than 20 feet. In Haverstraw Bay, juvenile Atlantic sturgeon were most commonly found in waters deeper than 20 feet (Sweka et al. 2007). The access channel would be dredged to a depth of 14 feet and although it would be relatively deeper than the surrounding shallow areas, it would still be shallower than the habitat typically occupied by both species of sturgeon. Because of their typical habitat associations, there is no reason to believe that either species of sturgeon would to be attracted to the project area.

C 18-77: Further, while the FEIS does propose construction windows for dredging operations, pile driving and other construction activities will be ongoing during the upstream migration period of the sturgeon. More restrictive construction windows are necessary to minimize the impact on these endangered species. (Carlock)

R 18-77: As outlined in the NMFS BO, restrictions on the driving of large piles between April 1 to August 1, coinciding with sturgeon spawning migration, will be mandatory and will require that the installation of large piles (8- and 10-foot diameter) be limited to 5 hours a day during this window. The federal and state resource agencies that were consulted throughout the development of the Tappan Zee Hudson River Crossing Project did not determine the need for construction windows for pile driving but will require a number of measures to mitigate noise impacts from pile driving. These will include: limiting pile-driving activities to 12 hours per day, noise attenuation through the use of bubble curtains, maintenance of ensonifed-free areas at

all times, use of vibratory hammer rather than impact hammer when possible, and use of pile-tapping prior to pile-driving to deter fishes from the immediate vicinity.

C 18-78: The proposed mitigation measures represent a good start to addressing some of the impacts of the project. However, given the enormous area to be dredged, and the slow recovery period, a much more robust mitigation plan than proposed in the FEIS is warranted.

Additional compensatory habitat reconstruction is especially vital to ensure the health of sensitive species in the Hudson River. Given that 175 acres of shallow water habitat will be disturbed by the dredging, a multiple of this acreage of similar shallow water habitat elsewhere must be restored to adequately compensate for the loss of habitat. Permanent shoreline hardening will result from the project and therefore equivalent shoreline softening in other areas should be undertaken. To compensate for expected injury and mortality to endangered species, direct contributions to the recovery of these species (investments in fishery resources, hatcheries, etc.) should be included in any mitigation plan. (Carlock)

R 18-78: A compensatory mitigation plan has been proposed by NYSDEC (see Appendix F-12 of the FEIS). This mitigation plan includes restoration of oyster habitat potentially lost during construction, as well as habitat restoration of tidal tributaries to the Hudson River and habitat enhancement of tidal wetlands. To compensate for impacts to endangered species, an extensive plan to map sturgeon habitat in the Hudson River, study dietary habits, and track movement patterns during project construction has been proposed. Public outreach aimed at sturgeon conservation will be accomplished through the distribution of information on the commercial by-catch of sturgeon in an attempt to reduce mortality resulting from fisheries. Numerous Environmental Performance Commitments to be imposed upon the selected contractor, as well as Reasonable and Prudent Measures and Conservation Recommendations required by NMFS will further avoid, minimize and mitigate project impacts and contribute to the recovery of the Atlantic and shortnose sturgeon. Relative to the benthos, their recovery will not be slow and will likely not extend past the construction period given that most of the benthic disturbance will occur in the first three years of the project (See response to Comments 18-65 and 18-69). The benthic species in the Tappan Zee region are well adapted to salinity and sediment disturbance.

It should be recognized that the FEIS presents a worst-case analysis in terms of potential impact to sturgeon and other fish species. For the reasons amplified in the response to Comment 18-64, it is expected that noise impacts from pile driving will be considerably less than predicted in the FEIS, the ITP application, and the BA. Because the extent of compensatory mitigation and conservation efforts were predicated on the elevated numbers predicted in the FEIS and BA, the sturgeon take numbers will be less, and the net conservation benefit will be greater, than previously indicated.

As discussed in FEIS Chapter 18, "Construction Impacts," the shoreline areas near the proposed bridge site are heavily engineered, possessing limited shoreline vegetation. The limited shoreline hardening will not impact soft shorelines because there are no soft shorelines.

A-2-18-4 GENERAL COMMENTS

C 18-79: Rockland County is still requesting a requirement that the project support a full-time Rockland County project manager and a full-time Rockland County construction inspector, appointed by the County and paid for by the project, as well as having the project reimburse any staff time expended during construction. (Vanderhoef)

R 18-79: As stated in response to Comment 18-12 in Chapter 24 of the FEIS, "NYSTA and NYSDOT, working through a Construction Management team would be responsible for compliance with many aspects of the project including adherence to the EPCs and permit conditions."

C 18-80: Rockland County has asked for the development and funding of a Construction Mitigation Transit Plan, and supplemental funding for the Tappan Zee Express operations during construction so that we may increase ridership and remove single occupancy vehicles from the bridge. (Vanderhoef)

R 18-80: Please see the responses to Comments 18-36 and 18-42 of Chapter 24 of the FEIS.

A-2-19 CHAPTER 19: ENVIRONMENTAL JUSTICE

NO COMMENTS RECEIVED.

A-2-20 CHAPTER 20: COASTAL AREA MANAGEMENT

NO COMMENTS RECEIVED.

A-2-21 CHAPTER 21: INDIRECT AND CUMULATIVE EFFECTS

C 21-1: The FEIS does not address the cumulative negative impacts that are likely to occur from the simultaneous development and construction of the 96-acre General Motors site in Sleepy Hollow. In the latter case, the Village of Sleepy Hollow has approved this project and its construction during the Tappan Zee Bridge Replacement Project period is a virtual certainty. (Fixell)

R 21-1: The construction start and duration and associated details for the former General Motors site are unknown at this time. General Motors (GM), the current owner of the site, has indicated that it will not develop the project and has yet to find a developer to take over the project. Any selected developer for the project may decide to vary from GM's proposal for the project, which would require an environmental review and a new or amended special permit from the Village of Sleepy Hollow. In addition, any selected developer would need to secure a number of additional permits and approvals from

federal, state, county and local agencies including the U.S. Army Corps of Engineers, NYSDOT, NYSDEC, New York State Office of General Services, Westchester County Department of Environmental Facilities, Westchester County Department of Health, and the Village of Sleepy Hollow Planning Board. Many of these permits and approvals are necessary before construction could begin, or would be obtained by a prudent developer before beginning construction. Substantial project changes resulting from the permitting process would also require additional review and approval by the Village Board. These factors confirm the speculative nature of the comment above, that simultaneous construction of the two projects is a "virtual certainty."

C 21-2: As noted above, we continue to believe that the FEIS wrongly assumes that increasing capacity by 25% on hugely influential regional transportation infrastructure will not have any effects of the area because the area already has well-established land use patterns. However, as noted above, this assumption is unconvincing. The bridge fills up with traffic during peak periods when four lanes are provided, yet, the state says the bridge will not fill up when four lanes are provided during non-peak periods. That fourth lane might induce development and traffic despite projected speeds on the roadway. The state has not seriously looked at this issue but it should. A more comprehensive analysis of the indirect and cumulative effects of the addition of a fourth, non-peak lane should be performed. (Vanterpool and Pellecchia)

R 21-2: The DEIS and the FEIS documented, with backup provided in appendix, the modeled results that demonstrate no change in off-peak traffic volumes with the addition of a fourth lane on the replacement bridge.

C 21-3: This EIS disregards the impact an increase in capacity can have on people's expectations. No analysis has been done as to whether and how expanding part of a roadway affects the portion of the roadway with less capacity. For example, the Garden State Parkway in New Jersey was wider in the north than in the south, with a significant amount of growth happening just at the end of the wider portion in the south. Eventually the volume became too great, and another lane was added. The FEIS should give more consideration to how the addition of capacity to part of a roadway impacts subsequent growth in other areas of the roadway. (Vanterpool and Pellecchia)

R 21-3: As described in the DEIS and the FEIS, the replacement bridge would not "induce" vehicle trips in the peak or off-peak directions as there would be no change in volume between the no build and build conditions. At this time, capacity enhancements along Interstate 87/287 are not reasonably foreseeable, and therefore, it is not necessary to consider the cumulative effect of such projects in conjunction with the replacement bridge. It should also be noted that any future capacity enhancements along the Interstate 87/287 corridor would be subject to environmental review requirements, including any necessary assessment of their indirect and cumulative effects.

C 21-4: Riverkeeper raised that the environmental review process for this Project is being segmented. The FEIS does acknowledge these comments; however, the lead agencies have still not studied all of the cumulative impacts of related future projects that should be considered in conjunction with the current project (e.g., the construction of mass transit, potential future improvements to adjacent highway segments, and demolition of the existing bridge). (Musegaas and Verleun)

R 21-4: See the response to Comment 3-17 in Chapter 24 of the FEIS.

A-2-22 CHAPTER 22: OTHER NEPA AND SEQRA CONSIDERATIONS

NO COMMENTS RECEIVED.

A-2-23 CHAPTER 23: FINAL SECTION 4(f) EVALUATION

NO COMMENTS RECEIVED.

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