

August 28, 2013

Ms. Elaine Stanley  
Remedial Project Manager  
Office of Site Remediation and Restoration  
EPA Region 1, Suite 100, OSRR 7-04  
5 Post Office Square  
Boston, MA 02176

Re: Amended Request for Addition of Blasting to the Final Determination, New Bedford South Terminal Project (New Bedford Marine Commerce Terminal (NBMCT Project))

Dear Ms. Stanley,

This letter is submitted in order to update USEPA with regard to new information received by the Massachusetts Clean Energy Center (MassCEC) during construction of the New Bedford Marine Commerce Terminal. The new information was generated during extensive pre-construction investigations by both MassCEC's contractor and MassCEC's engineering team and indicates the presence of approximately three times the previously estimated volume of rock within the dredge footprint adjacent to the new bulkhead. The additional rock is primarily manifested as an unanticipated increase in rock thickness. Because this new information requires alterations to the previously proposed method for implementing blasting in association with the project, this letter also serves as an amendment to MassCEC's May 20<sup>th</sup>, 2013 request to USEPA for the addition of blasting to the Final Determination for the New Bedford Marine Commerce Terminal project.

The format of this letter includes both a summary of the dialogue between EPA and MassCEC on this issue, a summary of the new information received, a formal request from MassCEC to EPA to increase the blast level, as well as a response to EPA questions regarding proposed alterations to the implementation of blasting.

### **Previous Dialogue Between EPA and MassCEC**

The Commonwealth had previously outlined within a letter to EPA on October 4, 2012 that it intended to utilize blasting as a rock removal means of "last resort". MassCEC submitted an update request to EPA on May 20, 2013, which outlined in more detail MassCEC's request for the implementation of blasting prior to the removal of the overburden. On June 13, 2013, EPA issued a letter indicating that EPA was not aware of any information that would prevent EPA from approving MassCEC's May 20, 2013 request, subject to conditions contained within the letter (letter included as **Attachment A**). After some discussion between MassCEC and EPA regarding Condition 7 of EPA's June 13, 2013 letter, as well as the specifics of the use of successive charges utilizing "delays" to minimize the peak pressure and peak impulse, EPA

issued a letter on July 24, 2013, revising Condition 7, and allowing for use of successive charges, so long as the delay between charges was at least 25 milliseconds (letter included as **Attachment B**).

### **New Rock Elevation Information**

As part of its due diligence during the design process, MassCEC advanced a number of borings into the subsurface both within the footprint of the future bulkhead, within the footprint of the proposed dredging, and into the upland of the proposed facility. In all, MassCEC advanced 32 borings within the proposed dredge footprint, and an additional twenty borings in the upland and bulkhead area. The detailed information on the borings, including boring locations and boring logs were included within the Commonwealth's January 18, 2012 submission to EPA. It was with this information that MassCEC estimated the volume of rock within the dredge footprint (approximately 7,500 cubic yards), and included such information within the specifications for the New Bedford Marine Commerce Terminal, submitted to EPA on December 15, 2012.

A diagram of the interpolated surface of bedrock utilizing the information available to MassCEC as of the promulgation of the bidding documents is included as **Attachment C**. As can be seen within this diagram, rock was anticipated to slope down gradually from west to east, and to increase in elevation as it moved to the south. Additionally, the borings, which were done at 100 foot interval spacing, indicated that the average anticipated thickness of rock was estimated at approximately 3 feet and the thickest anticipated section of rock was approximately 5 feet of rock above the target dredge elevation of -32 MLLW adjacent to the bulkhead.

MassCEC's rock interpolation can also be compared with the drawing (included as **Attachment D**) submitted within its May 20, 2013 submission to EPA, which indicated a slightly larger area anticipated to require blasting (this is the area anticipated at the time of bidding by MassCEC's Contractor to require blasting).

Although MassCEC believes that the number of borings was sufficient for design of the facility, it was understood that there was still a level of uncertainty with regard to the exact subsurface conditions at the time of bid. In order to keep this risk from interfering with installation of the proposed facility, additional investigations were required of the Contractor immediately prior to installation of the proposed facility. These investigations were required in order to confirm assumptions made during the design process, and to uncover any potential previously unknown conditions prior to the start of work. The investigations included the advancement of borings and other investigative methods at hundreds of locations, into the subsurface to confirm the condition and elevation of rock. It was during these investigations that rock elevations were found to be higher than previously anticipated.

Rather than slope along a plane between borings (as previously assumed), the rock has an extremely erratic surface, in some cases rising (and then falling) up to 10 feet in a very short distance moving west to east and north to south. MassCEC authorized several hundred additional locations for investigation in order to provide additional detail to the final elevations,

which have further delineated the area. The most recent and updated rock elevations are shown on an updated drawing included as **Attachment E**. Based on this data, MassCEC's current estimate of rock volume is approximately 23,200 cubic yards, approximately three times the volume previously anticipated. Although the area of blasting has not changed significantly, the average thickness of rock is now approximately 6 feet and the thickest layer of rock is approximately 15 feet.

Upon USEPA's suggestion, MassCEC is also commencing additional investigation in the two areas in the dredge channel north of the bulkhead area. However, we do not expect the rock elevation to exceed the abnormally high contours we have identified in the deep draft area.

### **Proposed Amendment to Request for Addition of Blasting**

Although the areal extent of rock removal is not anticipated to have changed significantly, the unanticipated thickness of rock makes the 50 pounds per delay insufficient to remove 15 feet of rock. If the limitation of 50 pounds per delay were utilized by MassCEC (as outlined within EPA's June 13, 2013 and July 24, 2013 letters), blasting would be unable to dislodge the full thickness of rock during the first blast. In addition, removal of overburden would need to take place in order to assess the condition of the subsurface prior to the initiation of additional blasting. It is likely that approximately 1/3 (of the thickest portions of the rock) would be dislodged, and that the overburden would then need to be removed to complete the blasting. The result would mean that two or three additional blasts would be required to fully dislodge the rock to the required depth, and these blasts would take place with no overburden to reduce the blast energy.

As outlined within MassCEC's May 20, 2013 letter to EPA, acoustic modeling information indicates that blasting without the overburden in place is more impactful than blasting with the overburden in place.

MassCEC's engineers, in consultation with GZA, our blast consultant, and the contractor, have determined that a charge level of up to 150 pounds will be required in order to dislodge rock in the deep draft dredge area. Therefore, MassCEC requests that the upper limit on the size of charge per delay be raised to 150 pounds from its current limit of 50 pounds. MassCEC wants to be clear that the 150 pound level will be the maximum allowed charge, and that the contractor will utilize smaller charge levels in areas of less rock.

### **EPA Questions**

MassCEC has received the following questions from EPA regarding this proposed change within an e-mail dated August 22, 2013:

- a. Data results of recent bedrock characterization and a plan showing the additional bedrock found and an estimated volume and areal increase;*

Two pre-construction interpretations and the most recent plan are included as **Attachments C, D, and E**. The pre-construction estimate for rock removal was 7,500 cubic yards, and the most updated estimate based on this new information is 23,200 cubic yards. The areal extent of blasting is not currently anticipated to have changed significantly.

- b. Any increase in charge size, along with the rationale for such increase (if so, this will likely trigger the need for further consultation with NMFS on ESA and EFH resources since the original consultations were based on a maximum 50 pound charge);*

A maximum charge size of 150 pounds is required in order to address the rock thicknesses identified within the dredge footprint. **Attachment E** provides estimates of these rock thicknesses as determined by borings (and other investigative means) at approximately 25 ft centers. Note that parameters for production blasting are set in such a way that the charge weight will vary according to the actual depth of rock encountered during blasting. Charges will be packed into holes drilled on a regular grid. All holes will be drilled to the same sub-drill elevation of minus 38 feet below MLLW. Charge material will be packed into rock with a length at the top of rock reserved for stemming (stemming directs the charge energy downward into the rock). Additionally, only so much explosive material will fit in each foot of drill hole length. Total charge size will therefore be determined as each hole is drilled based on total depth of rock plus sub-drill minus stemming, times the charge weight per foot. In areas where the depth of rock encountered during drilling is consistent with MassCEC's original expectations based on boring data, charge weights will be sized similar to their original expected weights. Additional information regarding methodology is included within the Contractor's blasting plan, included as **Attachment F**.

Note that it is not in the Contractor's interest, from the point of view of cost, schedule, performance, or safety, to drill deeper than the determined sub-drill or to pack charge above the top of rock. Therefore, for all practical purposes, the 150 pound charge limit will pertain only to a small percentage of charges on the entire project associated with the deepest rock. The weight of each charge and the extent to which charges must range up to 150 pounds will not be established with certainty until the hole for each charge has been drilled; thus, some flexibility on the part of the Contractor is required, in order to avoid a potential re-blasting scenario.

- c. The proposed timing and location of any expanded blasting. Will it be required in more than 3 areas? Is the Commonwealth asking for continuous blasting beginning in mid-September, or is past agreement of blasting in one area in September followed by EPA evaluation to determine if more blasting can occur before November 15 still the path forward? Is the proposed expanded blasting anticipated to go beyond the allowed time window (i.e. past January 15)? If so, that will run into the time of year restrictions for winter flounder, and, depending on the duration, spring migration of sturgeon and other anadromous fish. Any of these changes may also require additional EFH and ESA consultation with NMFS;*

The blasting will take place within the same areas previously contemplated by EPA. The size of the areas has not changed significantly.

MassCEC anticipates that the blasting could begin on September 15 as previously agreed, and still accepts the agreement previously stipulated with EPA that impacts following the first blasting area would be carefully evaluated before blasting could commence in the two areas to the north.

Due to the likely delays associated with increased drilling time (through thicker rock), MassCEC currently anticipates that the blasting would take two months, rather than one. Therefore, MassCEC envisions that the work would begin as close to September 15<sup>th</sup> as possible and end on November 15<sup>th</sup>. An updated schedule is included as **Attachment G**. MassCEC understands that blasting cannot take place after January 15<sup>th</sup>.

*d. Any change to the delay time of 25 milli-seconds;*

MassCEC does not anticipate requesting a change to the 25 millisecond delay scenario.

*e. Will pre-split blasting be included? If so, a description of the pre-split blasting protocol;*

MassCEC had discussed (on a preliminary basis) shortening the 25 millisecond delay in association with pre-split blasting (which is a line of lightly-loaded charges that run along the face of the bulkhead to minimize impacts to rock to the west). In good faith, MassCEC has investigated potential other alternatives to reducing the 25-millisecond delay, and has determined that line-drilling (i.e. drilling of closely spaced borings along the bulkhead face) may be utilized instead of pre-split blasting to minimize impacts to rock to the west. As a result, MassCEC currently anticipates that line-drilling will be utilized instead of pre-splitting, in order to prevent the previously discussed reduction in the delay times.

*f. Approval from the U.S. Army Corps of Engineers Levee Safety Program addressing impacts of any proposed expanded blasting (and pre-split blasting, if included) on the hurricane barrier;*

As EPA is aware, the Commonwealth employed GZA Geoenvironmental, Inc. (GZA) during the fall of 2012 (prior to the issuance of EPA's Final Determination) to conduct an assessment of potential blasting impacts to the New Bedford Hurricane Barrier. GZA produced a table outlining acceptable charge weights vs. distance to the Hurricane Barrier, and MassCEC included that table (with an additional reduction of ½ of the charge weight) into its specifications.

Due to the uncertainty regarding the implementation of blasting, the timing of construction, and the contractor to be hired by MassCEC (and its experience conducting blasting operations), both GZA and the Commonwealth were extremely conservative in their analysis of potential impacts to the Hurricane Barrier and the charge limits that were subsequently imposed. At the time of bidding, the very conservative nature of the charge limitations was not considered significant, due to the perceived quantity and thickness of rock anticipated to be within the dredge footprint.

Also, please note that the reason that JASCO's original model included a 50 pound charge as the upper limit was, in no small part, to the constraints already in place in association with the GZA analysis of impact to the Hurricane Barrier, which was, as previously stated, very conservative.

However, after reviewing the updated information regarding higher rock elevations and thicker layers of rock, MassCEC and GZA re-evaluated the available information and determined that the charge limitations were more than 10 times more conservative than what was necessary to adequately protect the New Bedford Hurricane Barrier. These limitations included both conservative assumptions on liquefaction and slope stability calculations, but also included conservative assumptions regarding the resulting accelerations applied to structures measured at distances from the blast locations. That is, the accelerations measured in real-time during blasting would have been almost an order of magnitude lower than what was originally projected in the GZA report, based on the recommended charge weights and distances.

On August 22, 2013, MassCEC and GZA met with USACE personnel to discuss the report and request that the report be revised to more accurately reflect existing needs for higher charge weights. USACE reviewed the updated technical information presented to them and agreed that the GZA report was conservative, and that higher charge weights should be acceptable. GZA will be resubmitting its report to USACE on Thursday, August 29, 2013, and MassCEC anticipates acceptance of the revised plan shortly thereafter. A copy of the revised plan, which will include a new table of acceptable charge weights, will be forwarded to EPA once it is available.

*g. A written evaluation of the impacts to aquatic resources potentially caused by any proposed expanded blasting (and pre-split blasting) and associated mitigation measures and a demonstration that the modified blasting program will result in no adverse impacts to aquatic resources;*

EPA has proposed, or has required, the following restrictions on blasting:

- Maximum charge size of 50 pounds; and.
- Overburden must remain in place during blasting.

As previously stated within MassCEC's May 20, 2013 letter to EPA, each of these restrictions is protective of the environment as follows:

- As the charge size increases, the impacts from peak pressure and impulse increase; and
- MassCEC has shown that the overburden absorbs some of the energy from charges, which reduces the peak pressure and impulse from the charge.

However, given the higher rock elevations found within the dredge footprint, these two conditions are now in conflict, because the limitation of the maximum charge size to be 50 pounds will prevent blasting from being successful, and (since subsequent second, third, or possibly fourth rounds of blasting could not take place until the overburden was removed to assess the existing conditions), the limitation that the overburden must remain in place during blasting would then eliminate the possibility that further blasting could take place at all.

Thus, it is necessary to consider an increased maximum charge weight up to 150 lbs in locations where there is the most rock. Therefore, the primary purpose of this section is to evaluate the options for successful implementation of blasting, and determine which is the Least Environmentally Damaging Practicable Alternative. These options are:

**1. Option 1: No Blasting.**

This alternative would eliminate blasting from consideration. As blasting is necessary to achieve the goals of the project, this alternative would halt construction of the project and is therefore not considered further as it is considered impracticable.

**2. Option 2: Blast with 50 pound charge maximum only, remove the overburden after initial blasting, blast one to two times more, clearing the overburden after each blast, until depths are achieved.**

This option would limit the size of the peak pressure and peak impulse impacts to those that have already been reviewed and approved by EPA for the first blast; however, this option would require EPA to rescind its proposed requirement that no blasting could occur after the overburden had been removed (as a maximum 50 pound charge will not be capable of removing all rock). The second (and third or possibly a fourth) charges would not be able to be set until the fractured rock surface were evaluated to determine how best to proceed. This could not take place without removing the overburden and blasted rock and performing a survey.

The second (and likely third, with a possibility of a fourth in some cases) blast(s) would therefore need to take place during the spring of 2014 without the overburden in place. As noted on page 6 of MassCEC's May 20, 2013 letter:

“As the model results shown above indicate, compared to the “Buried at Depth” (“With Overburden”) modeling scenario (which would have a 100% environmental impact within a 210 foot radius), the “In Water” (“No Overburden”) scenario has a 345% ( $390^2/210^2$ ) areal impact by comparison. Please note that this larger acoustical impact would be compounded further by the noise and turbidity impacts of extended mechanical rock removal efforts that would be required in a “last resort” scenario before blasting is attempted.”

Therefore, in this situation, not only will there be a large percentage of locations where a second, third (and perhaps fourth in some cases) blast(s) take place, all but the first blast will

take place without the overburden in place, resulting in a 345% increase in impacts for each round of blasting from those second through fourth blasts. The minimum total impact of these additional two to three rounds would result in an increased impact of at least 689% [2 X 345%] to 1035% [3 X 345%], as compared to the blasting scenario envisioned prior to the receipt of this new subsurface data, with 50 pounds being the maximum charge weight in that scenario.

### **3. Option 3: Increase the maximum charge weight to 150 pounds**

This option would increase the charge weight to the size necessary to complete the blasting at each location.

Based on the model and mathematics contained within the November 2012 JASCO report, the mitigated radius of influence of the impulse impact for a 150 foot charge would be approximately 480 feet (as compared to the 210 foot impulse radius calculated by JASCO in association with a maximum 50 pound charge). This would result in a 522% ( $480^2/210^2$ ) increase in the overall impact in association with these maximum charges, as compared to the blasting scenario envisioned prior to the receipt of this new subsurface data, with 50 pounds being the maximum charge weight in that scenario. Please note that the maximum charges would only be used in the locations where the rock is the thickest.

In order to illustrate the overall impact of the increase in charge weight for the thickest rock, two diagrams have been prepared (included within **Attachments H and I**). These diagrams show the outline of the anticipated extent of impact prior to the new bedrock elevation information with 50 pounds as a maximum charge as a red or orange line, and the potential increased area of impact (from the maximum 150 pound charges) as purple or black circles, centered around the areas with the thickest rock. These diagrams indicate that even with the increase of charge size, the November 2012 JASCO model mathematics indicate that the increased impacts would be primarily to the southeast and south, and would not represent a significant increase in overall area.

### **Update to JASCO Model**

As presented within its November 2012 report, JASCO's blast modeling consisted of calculations of impulse as a function of charge weight and distance based on the results of empirical equations of transmission of energy through the water column from an underwater explosive source (as derived from Swisdak 1978 and employed by the Underwater Calculator spreadsheet developed by Dzwilewski and Fenton in a 2003 paper).

These equations for pressure and impulse do not take into account the mitigating effects of bedrock confinement and overburden. In order to incorporate these factors, JASCO adjusted the effective weight of the charge with a coupling efficiency factor that was derived from Dzwilewski and Fenton (2003) which compared the explosive coupling efficiency for a charge buried in clay sediments and for a charge placed inside a steel pipe driven into clay sediments. At the time, JASCO was assuming that the charge inside the steel pipe would approximate a charge confined in rock and buried under the overburden.

After having discussed the presence of additional unanticipated rock within the dredge footprint with JASCO, and after JASCO reviewed the Contractor's blasting plan, JASCO has proposed an alteration to the coupling efficiency assumptions within the original November 2012 JASCO report. JASCO believes that the alteration to the coupling efficiency more accurately reflects the confined, high compressive strength rock, the 2 foot layer of stemming that will confine the blast within the rock, and the additional layer of overburden that will remain in place during blasting, all of which are anticipated to absorb a significantly greater degree of blast energy than a steel pipe driven into clay sediments. As a result, JASCO has calculated a much smaller radius of influence in association with all charge weights (JASCO's new analysis analyzes 30 pound charges to 150 pound charges). An executive summary of JASCO's updated findings are included as **Attachment J**.

The end result of JASCO's updated findings is that a 150 pound charge is now anticipated to have an unmitigated radius of impact for impulse of approximately 268 feet. JASCO does not cite a mitigated radius of impact, but it is anticipated that the use of bubble curtains would mitigate this radius to a smaller distance than the mitigated impulse radius of impact cited within the November 2012 JASCO report, which was 210 feet.

As a result of this analysis, MassCEC believes that the actual impacts in association with use of a maximum charge of 150 pounds would be below the previously-anticipated impacts in association with the use of a maximum charge size of 50 pounds as outlined within the November 2012 JASCO report, and as previously evaluated by EPA within its June 13, 2013 and July 24, 2013 letters.

### **Conclusion and Discussion**

As stated in our August 27, 2013 meeting, MassCEC does not believe that the project can be completed as planned without the use of blasting. As noted above, when calculating impacts in accordance with JASCO's November 2012 report, as compared to the blasting scenario envisioned prior to the receipt of this new subsurface data, with 50 pounds being the maximum charge weight in that scenario, Option 2 would have significantly higher environmental impacts than Option 3. Based on the available options, MassCEC has determined that Option 3 is the Least Environmentally Damaging Practicable Alternative because the anticipated increased environmental impact for the use of a maximum charge of 150 pounds is lower than the alternative of conducting multiple 50 pound charges.

Additionally, JASCO has submitted an Executive Summary of an update to its November 2012 report. Within its summary, JASCO has indicated that the coupling efficiencies utilized to determine energy transmission between a blast within bedrock with overburden in place may be refined to more accurately reflect real-world conditions. The refinement of the model results in substantially more energy absorbed by rock, stemming and overburden than had previously been assumed, and therefore, smaller radii of influence in association with peak pressure and peak impulse. Using this better understanding, the incremental increases in impacts from use of a maximum 150 pound charge size are not anticipated to be significantly different than the

impacts anticipated from a the initial model results for a 50 pound charge size. As a result, it appears that there will not be a significant increase in impacts, in association with the use of a maximum 150 pound charge, as compared to the impacts which EPA based its previous position on.

### **Mitigation Measures**

MassCEC has previously proposed a comprehensive list of mitigation measures in order to minimize impacts to marine resources and has similarly been receptive to proposals from EPA with regard to additional measures that could be additionally protective. Although these items have been detailed within MassCEC's prior submittals (most particularly within its May 20, 2013 submittal), they include:

MassCEC understands that the EPA is concerned with the potential impact to fish communities due to blasting, primarily as a result of issues that were generated during blasting that was overseen by the USACE during 2007. MassCEC has reviewed a paper forwarded by EPA entitled "AFTER ACTION REPORT ON THE FISH KILLS RESULTING FROM BLASTING IN SUPPORT OF ROCK REMOVAL FROM THE FEDERAL NAVIGATION PROJECT -BOSTON HARBOR, MASSACHUSETTS- (FALL 2007), by the USACE, dated June 2008" (included as **Attachment K**).

MassCEC is aware that communication problems between the fish observers and the contractors appear to have been a large source of the issues that resulted in large quantities of fish being killed within Boston Harbor during this project. MassCEC has discussed this issue with Cashman-Weeks NB, and the Contractor has prepared the following operation and communication plan (see **Attachment L**) that is intended to minimize the chance that such a miscommunication will take place in association with the South Terminal Project.

Prior to blasting, MassCEC proposes to isolate the blast areas in a similar method as has previously been successful in association with the Fish Deterrent System. It is MassCEC's understanding that flatfish will not be as high a concern as during the conventional implementation of the Fish Deterrent System; therefore fish weirs will not be installed as part of this effort. Silt curtains will be installed to prevent fish from entering the potential blast areas. The acoustic modeling conducted to date clearly indicates the areas that have the greatest likelihood of being affected by the blasting (i.e. the radius as noted previously around each blast site), and therefore will also be the areas within which fish exclusion efforts will be focused. Prior to the initiation of blasting, a fish inspection (similar to those associated with the Fish Deterrent System) will be undertaken to determine if fish are present in the blast area. MassCEC will perform the fish inspection in compliance with Fish Deterrent System protocols. If necessary, "fish scaring" or "fish startling" will be used to clear the area of fish. The historic effectiveness of this methodology indicates that multiple "fish startling/scaring" efforts will not be

necessary. Subsequent to the clearing of the area, drilling and preparation of the area for blasting will begin.

Due to the human and public safety risk involved with placing explosives, the Contractor is constrained by a time limit with regard to how long the holes may stay open with explosives in place, prior to blasting. In order to make the most efficient use of this time, the Contractor proposes to work diligently to drill and install explosives in the shortest time possible, in order to leave sufficient time once the blast is prepared to monitoring for the presence of schools of fish. In addition, the Contractor has outlined its communication plans associated with the work to demonstrate how clear lines of communication will be maintained. The details of the Contractor's plan are included within **Attachment L**.

As outlined within MassCEC's specification section 02900 – BLASTING, a dedicated marine observer will be on hand to ensure that a concerted effort is being undertaken to inspect for the presence of schools of fish. This extra time will also allow for "fish scaring" should fish be observed prior to the actuation of any blasting. However, please note that worker safety will take precedence over inspection and scaring operations if necessary in the blasting area.

MassCEC believes that these measures will ensure that the impacts observed in Boston Harbor are not repeated on the South Terminal Project.

MassCEC would also like to repeat that Section 02900, Part 3.9.2.1, Subpart 8 of the specifications for the New Bedford Marine Commerce Terminal require the use of both silt curtains and bubble curtains to enclose blasting areas.

*h. An updated JASCO model evaluating pressure and impulse impacts resulting from the proposed expanded blasting program;*

MassCEC has been in contact with JASCO to communicate the new information. JASCO has conducted additional analysis and has presented its analysis within an executive summary included as **Attachment J**.

*i. A written description of any additional impacts to the local community and how these communities will be protected. Also, a description of the Commonwealth's plan for informing the public of the proposed expanded blasting;*

MassCEC and its Contractor are in the process of implementing a robust communication program to communicate the blasting program, which includes: direct communication with property and business owners within 1,500 feet of the blasting program, pre-blasting photographs and videos of existing conditions of structures within the 1,500 foot radius, public notification via local media, meetings with emergency services personnel from federal, state, and local agencies, two pre-blasting public meetings, and a hotline for blasting-related questions. Please note that this communication program has been in accordance with USACE

guidelines for any size blasting program. The plan for informing the public on the proposed blasting has not, to date, been specific with regard to charge sizes, hole spacing, or other particular information, nor is that a typical procedure with this type of blasting.

As the overall area of blasting has not changed, and modeling of the blast impact on adjacent structures (as projected from GZA's analysis of impacts to the Hurricane Barrier) was noted to be extremely conservative, the proposed changes in the blasting program are not anticipated to change the effect to the local community. MassCEC does not believe that the change in charge size represents a significant enough alteration in the program to warrant specific communication regarding these changes, particularly due to the fact that the changes are aspects of the program that have not previously (and would not typically) be communicated to the public.

*j. A written description of how the proposed expanded blasting and pre-split blasting complies with state ARARs, including proximity to and any impacts on the paleosol areas and whether or not the Commonwealth will provide this information to the tribes for tribal consultation; and*

The Commonwealth considered the implementation of blasting within its June 18, 2012 ARAR's letter contained within Appendix D to the Final Determination (blasting is noted on page 2 of that letter within the list of potential impacts). The Commonwealth has provided subsequent confirmation within its May 31, 2012 email (see **Attachment M**). The Commonwealth's confirmation was made prior to EPA's announcement of its intention to restrict the maximum charge size at 50 pounds (made within EPA's June 13, 2013 and July 24, 2013 letters); therefore, the increase in charge size does not appear to present new information that would require a separate re-evaluation of state ARARs.

The Commonwealth evaluated potential impacts to intertidal and sub-tidal paleosols within its June 25, 2012 communication to USEPA. The following was stated within that document:

"The Commonwealth has compared the scope of its previous cultural resource investigations with the changes proposed within the Commonwealth's June 18, 2012 submittal and has determined that the actions will take place within areas that have previously been investigated and are significantly far from the existing delineated sub-tidal and/or intertidal paleosol areas that have been delineated as a result of investigations completed to date, and therefore will not adversely effect the subtidal or intertidal paleosol areas.

The potential expansion of the deep draft area to the north and south, the potential blasting, and the potential expanded width of the navigational channel are all located on the northern portion of the eastern face of the proposed bulkhead. The anticipated maximum radius of impact of blasting will be approximately 50 feet. The nearest paleosol area is located on the southern face of the proposed bulkhead, which is a considerable distance from the proposed additional work."

As the overall area of blasting has not changed, and has not moved closer to the Paleosols (and, in fact, has moved further north, away from the Paleosol areas as a result of MassCEC's determination to abandon its pursuit of the expansion of the deep dredge footprint 100 feet to the south), and as the previously discussed modeling of the blast impact on adjacent structures (as projected from GZA's analysis of impacts to the Hurricane Barrier) was noted to be extremely conservative (and as a result, the subsequent increase in charge sizes will have no more impact than what was previously modeled), the proposed changes in the blasting program are not anticipated to increase or in any way change the impacts on the Paleosol areas.

*k. An updated construction schedule.*

An updated construction schedule is included within **Attachment G**.

MassCEC sincerely appreciates the extraordinary amount of time and attention EPA staff has committed to this vital and historic clean energy project, and respectfully requests once again your timely consideration of this very important matter. If you have any questions related to this proposed modification to the Final Determination, please do not hesitate to contact me at 617-315-9330.

Sincerely,

*Bill White*

Bill White  
Director, Offshore Wind Sector Development