From:	Bill White
To:	Dierker, Carl
Cc:	Alicia Barton
Subject:	FW: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations
Date:	Tuesday, July 16, 2013 4:55:07 PM
Attachments:	image002.png image003.png JASCO Letter.pdf

Carl,

Please see the attached letter from Jasco Applied Sciences and Chet Myers' note below. As you know, this is the final, critical issue and the stakes for the project schedule are enormous. Please let us know if you can provide approval as soon as possible.

Many thanks,

Bill

Bill White
Director, Offshore Wind Sector Development
Massachusetts Clean Energy Center
55 Summer Street, 9th Floor, Boston, MA 02110
(617) 315-9330

www.masscec.com

From: Chet Myers [mailto:cmyers@apexcos.com]
Sent: Tuesday, July 16, 2013 3:00 PM
To: Bill White
Cc: Eric Hines
Subject: FW: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations

Hi Bill,

As you know, MassCEC has protested Condition #7 of EPA's June 13, 2013 letter, which limits the total weight of explosive charges per shot used within blasting operations at the New Bedford Marine Commerce Terminal to 50 pounds, as such a restriction is infeasible.

Explosive use is typically applied with limits "per delay" rather than "per shot" as the "peak pressure" and "peak impulse", which are the two factors that are indicative of fish mortality and injury, can be minimized by keeping successive pressure (or successive impulse) waves from overlapping via the use of "delays" (tiny breaks between blast actuation times). As the blast waves travel very quickly, the "delays" are also very short, typically measured in milliseconds.

For the purposes of the model produced by JASCO Applied Sciences, the controlling “peak pressure” and “peak impulse” used as a basis of comparison were 75.6 psi and 18.4 psi-msec, respectively, which were derived from experimental results generated (and forwarded to Apex prior to the start of modeling in 2012) by NMFS. NMFS indicated that if the “peak pressure” and “peak impulse” of the charges could be kept below these factors, then there should be no injury and/or mortality outside of the area of impact. Please note that the NMFS experimental data was gathered via testing on shortnose sturgeon and was intended to be predictive of whether mortality and/or injury would occur to Atlantic Sturgeon.

EPA has been requesting written confirmation that the model produced by JASCO Applied Sciences, Inc. is applicable to a “charge per delay” use of explosives.

We have been working over the past few weeks to re-engage JASCO, with whom we have previously had some contractual issues. Although we are still having contractual issues with JASCO, they were kind enough to issue this clarification letter last Friday.

The letter stipulates that the modeling conducted by JASCO is applicable to “charge weights per delay” in addition to single charges. Essentially, this means that the “peak pressure” and “peak impulse” levels will not change if there is one or multiple blasts, so long as the minimum delay is utilized.

Although JASCO acknowledges that the “peak pressure” and “peak impulse” waves last no more than a few milliseconds, JASCO recommends a minimum delay of 25 milliseconds, which is consistent with the 25 millisecond delay also used by NMFS within their study.

Thanks,

Chet Myers
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From: Marie-Noel Matthews [mailto:Marie-Noel.Matthews@jasco.com]
Sent: Friday, July 12, 2013 3:14 PM
To: Chet Myers
Cc: Jay Borkland; Roberto Racca; David Hannay; Scott Carr
Subject: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations

Chet,
Following our phone conversion on modeled results for explosive rock removal operations, I have attached the letter you requested.

If, after you read this letter, you have any concerns or questions, please don't hesitate to contact me.

Regard,

Marie-Noël R. Matthews
Project Scientist

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To: Chet Myers
Apex Companies, LLC
125 Broad Street, 5th Floor
Boston, MA 02110

Date: 12 July 2013

RE: **Underwater Acoustic Modeling of Explosive Rock Removal Operations for the Marine Commerce South Terminal in New Bedford, MA.**

Mr. Myers,

From a physical standpoint, the distances to impulse levels for injury criteria (18.4 psi·s) stated in our report can be validly considered as distances for charge weight per delay for delays of 25 ms or greater. This statement is based on the fact that the integration period for the impulse metric is defined as the time elapsed from the onset of the primary pressure wave to its return to ambient, i.e. the duration of the first positive pressure wave; this will be applicable individually to the events in a delayed sequence of detonations as long as the onset of an event does not overlap the positive phase of the previous one. While the positive pressure phase of an event may last just a few milliseconds, in practice some standard delay guidelines are generally applied to ensure a clear separation under realistic conditions. Not having found official directives from NMFS regarding minimum acceptable delays, and in the absence of details about the charge layout geometry for the construction activities for the New Bedford terminal, we recommend a minimum time delay of 25 ms between detonations based on Canadian guidelines for the use of explosives in or near fisheries waters (Wright and Hopky 1998) and experimental results presented by the National Marine Fisheries Services (NMFS; Bullard, J. K. 2012).

JASCO's analysis was limited to the physical estimate of acoustic parameters, and does not attempt to provide an interpretation of the biological impact on fish.

Regards,

Marie-Noël R. Matthews

Project Scientist

Literature Cited

Bullard, J. K. 2012. RE: Route 52 Causeway Replacement & Somers Point Circle Elimination Contract B. Letter to Kostas Svarnas, U.S. Department of Transportation, New Jersey Division. 13 p.

Wright, D.G., and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Can. Tech. Rep. Fish. Aquat. Sci. 2107: iv + 34p. http://www.dfo-mpo.gc.ca/Library/232046.pdf