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November 14, 2024

Chase Davis
Cashman Dredging & Marine Contracting Co., LLC
1761 CT 12
Gales Ferry, CT 06335

Subject: Gales Ferry Project
Vibration Impact Analysis - Addendum

Mr. Davis,

After reviewing the HMMH memorandum issues by Scott Noel and Michael Carter on November 10, 2024, I would like to briefly address the difference between construction vibrations and blasting vibrations.

While the vibration limit 0.30 in/sec referenced to the FTA may be appropriate for construction vibrations, it is simply not appropriate to apply this limit to vibration from blasting activities.

When discussing construction limits, it is easy to consider blasting activities as a part of the construction activities, however vibration limits for construction activities are intended to apply to long duration, low frequency vibrations like truck traffic, drilling and pile driving while blasting activities produce short duration, high frequency vibrations.

While a vibratory compactor, drill or hoe ram can cause vibrations that continue for minutes or even hours, the vibration from a typical blast event is less than one second in duration. The extremely short duration of vibration from a blast event does not allow for a structure to oscillate/reverberate with the frequency of the vibration in the same manner as low frequency long duration vibrations can cause amplifications of the vibration in the structure.

This is why vibration from blasting in the US follow regulations based on the USBM “z-curve” discussed in the original report. As previously stated, these limits “remain the most restrictive criteria in existence that are based upon measured structural responses and observations of cracking correlated to specific vibration events. They provide a guaranteed safe level to guide blasting practices and limits suitable for regulations. They account for the widest possible range and worse-case conditions for low-rise residential structures.”¹

Vibration limits for blasting are based on over 40 years of research and have been proven effective in preventing damage for over 40 years since enacted. Vibration limits for blasting are set below ½ the level where analysis shows damage is possible. Blasts for this project will be designed to produce vibration levels below ½ the limit at the closest structure, therefore vibration from blasting

¹ Vibrations from Blasting, Chapter 1, page 3, Copyright © 2000 International Society of Explosives Engineers – David E. Siskind, Ph.D.

activities will be less than 25% of the level where over 40 years of research indicates that damage is possible.

Sincerely,
Sauls Seismic, LLC

A handwritten signature in black ink, appearing to read "Gregory B Poole". The signature is written in a cursive style with a large, sweeping initial "G".

Gregory B Poole
VP – Technical Services