



# Meliora Environmental Design

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Ed Rodgers  
Delaware Riverkeeper Network  
925 Canal Street, Suite 3701  
Bristol, PA 19007

RE: Headquarters Road over Tincicum Creek  
Alternative Analysis Study Review

Dear Mr. Rodgers:

Meliora Design has reviewed the subject documents for potential impacts from construction over Tincicum Creek, a designated Exceptional Value stream. The results of our review are listed below.

1. The documentation provided is a summary alternative analysis study that does not include detailed hydraulic calculations of the identified preferred alternative. The hydraulic calculations presented in a detailed Hydrologic and Hydraulic Report (H&H Report) would include scour calculations, as well as information regarding peak flows, channel material and floodplain soil conditions that would allow a more thorough review of the potential impacts from this project to Tincicum Creek.
2. The Alternative Analysis Study (AAS) recommends Alternative 1 as the preferred design for the replacement of the existing bridge. Alternative 1 offers the most suitable option for improved hydraulic conveyance of the six alternatives analyzed; however, the report raises some concerns with regard to the impact of this design on the Exceptional Value (EV) rated Tincicum Creek that may be addressed in the Hydrologic and Hydraulic Report. The AAS identifies increased flow velocities upstream of the proposed bridge ranging from 0.59 – 1.05 cfs for the 25-year storm. Attachment 1 to the AAS includes HEC-RAS output for each proposed alternative; the HEC-RAS output for Alternative 1 indicates an increase in velocity, as well as an increase in shear, through the proposed bridge opening. These increases may potentially impact the stream channel both upstream and downstream of the proposed crossing. The information needed to thoroughly evaluate those potential impacts was not included in the AAS.
3. All alternative designs presented for replacement of the existing bridge include expansion from one to two vehicular travel lanes. The increased length of the bridge required to convey this additional traffic will increase the length of the stream which will be constricted due to the fill within the floodplain and may result increase the potential for increased erosion and scour throughout the project. The information provided in the AAS did not include full engineering analysis of the channel hydraulics for any of the preferred alternatives.

A review of the proposed construction documentation and erosion and sedimentation control plan, as well as the detailed calculations within the H&H Report would allow more thorough evaluation of the overall impacts of this project both during and after construction

Sincerely,

A handwritten signature in black ink, appearing to read 'Ruth Ayn Sitler', with a stylized flourish at the end.

Ruth Ayn Sitler, PE  
Water Resources Engineer

Cc: Michele C. Adams, PE  
President