EastStar Environmental Group, Inc.
Consulting and Field Services

August 23, 2013

Mr. Matthew Turner
Bureau of Inspection and Review
Site Remediation Program
New Jersey Department of Environmental Protection
401 East State Street
Mail Code 420
Trenton, New Jersey 08625

RE: Quantification of Variance on PAH Concentrations
Rahway Arch Site Remediation PI Number G000007844

Dear Mr. Turner:

In response to Terry Sugihara's August 19, 2013 review memo on the RAW Addendum for the Rahway Arch Site and our subsequent conversations, I am providing this additional information regarding the quantification of the potential PAH concentrations in the engineered fill cap system being used to remediate the Rahway Arch Properties Site.

The RAW Addendum provides detailed justification for the variance to use the existing site mean concentration for the six PAH compounds rather than then 75th percentile of the existing site concentration from the Tech Rule. The Addendum states:

> "Because the majority of batches will have concentrations less than the 75th percentile, the overall impact on the PAH concentration in the cap will be negligible. Approximately 1,600 samples will be collected and analyzed to characterize the cap. Having a few samples that are between the 75th percentile and the mean of the existing site concentrations will not have an adverse impact on the quality of the remediation, and the cap will be protective of human health and the environment."

The Department has requested that EastStar quantify the extent of the variance and the impact on the PAH concentration in the engineered fill cap. EastStar reviewed PAH analysis data from 1,565 batches of soil from Soil Safe's historical database. Each batch represents 1,000 $yd^3$ of soil. In total, these batches represent approximately the same volume of soil that will be needed to remediate the Rahway Arch site. The analyses showed that the PAH concentrations in approximately 75% of the batches had PAH concentrations below the 75th percentile of the existing concentration on the Rahway Arch site and 95% of the batches had PAH concentrations below the existing mean concentration on the Rahway Arch site.

This analysis would indicate that the average PAH concentrations in the engineered fill cap will be approximately 40% of the existing mean concentration and will not exceed 1.25 times the 75th percentile. As was previously discussed, no individual sample can exceed the existing mean concentration on the Rahway Arch site. This is summarized in the following table.

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**Summary of Maximum PAH Concentrations in the Engineered Fill**

| PAH Compound | Existing Conditions | | Engineered Fill Cap | |
|---|---|---|---|---|
| | 75th Percentile Concentration (mg/kg) | Mean Concentration (mg/kg) | Maximum Average Concentration (mg/kg) | Maximum in Any Sample (mg/kg) |
| Benzo(a) anthracene | 1.32 | 3.99 | 1.64 | 3.99 |
| Benzo(a) pyrene | 1.24 | 3.77 | 1.54 | 3.77 |
| Benzo(b) fluoranthene | 0.972 | 3.58 | 1.21 | 3.58 |
| Benzo(k) fluoranthene | 1.23 | 3.38 | 1.53 | 3.38 |
| Dibenz (a,h) anthracene | 0.655 | 1.04 | 0.820 | 1.04 |
| Indeno(1,2,3-cd) pyrene | 0.723 | 1.71 | 0.900 | 1.71 |

This limit in PAH concentrations meets the intent of the Tech Rule because it limits the PAH concentrations in the engineered fill to less than half of the existing concentrations, before event taking into account the treatment of the engineered fill product through the solidification/stabilization process. Additional justification regarding the variance, including the protectiveness of the plan, is documented in the August 16, 2013 RAW Addendum. As the LSRP, I can attest that this engineered fill capping system is fully protective and is the only viable option to protect human health and the environment at this site.

If you have any questions, please call me at (410) 290-8777.

Sincerely,
EastStar Environmental Group, Inc.

Albert P. Free, P.E., CSP, LSRP
President

cc: Chet Pucillo – Rahway Arch Properties, LLC
Bill Roberts – Soil Safe
Mark Smith – Soil Safe
Ken Kloo – SRP
Terry Sugihara - SRP