

**Remarks by**

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

**to Middlesex County Division of Solid Waste Management**

March 7, 2012

Good evening. My name is Al Free. I am a licensed professional engineer and licensed site remediation professional (LSRP) in the State of New Jersey. I have been retained by the site owner, Rahway Arch Properties, to further investigate, develop a work plan and monitor the remediation of this contaminated site. As part of the remediation, I will be responsible for ensuring that all of the cap material manufactured by the proposed Class B Recycling Center is safe and meets the requirements specified in the approved Remedial Action Workplan.

The overall site is 125 acres. The contaminated portion of the site encompasses approximately 85 acres, consisting of six waste disposal impoundments surrounded by berms (See Figure 1). The impoundments contain approximately 2,000,000 tons of alum and yellow prussiate of soda (YPS) sludge deposited by American Cyanamid (now known as Cytec) from the 1930s through the early 1970s. This sludge contains heavy metals and cyanide. These impoundments are open to the elements and act like bathtubs to trap precipitation. With nowhere else to go, this water percolates through the sludge where it picks up contaminants and carries them into the groundwater. I estimate that 25 million gallons of water per year percolate through the sludge and into the groundwater. And, my estimate may be conservative. In the 1980s, Cytec's consultants estimated the volume of percolation at 46 million gallons per year.

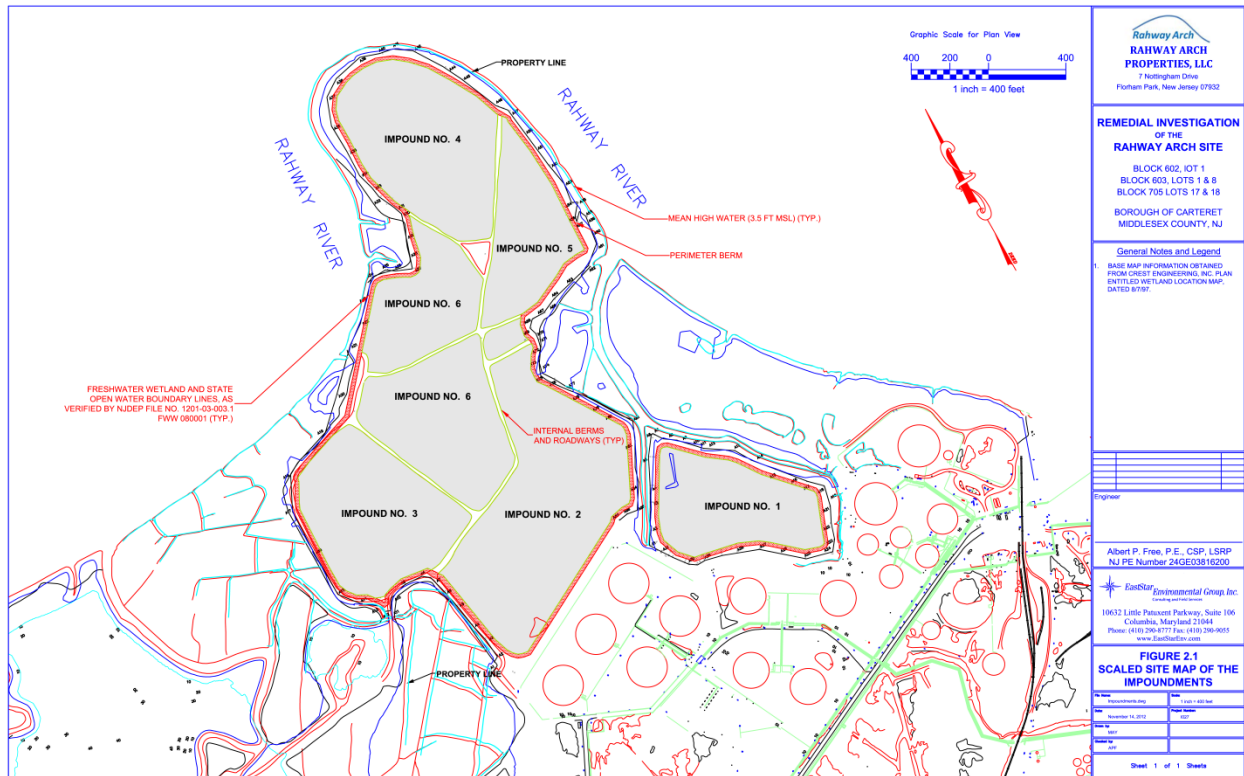


Figure 1 - Rahway Arch Site - Property Boundaries, Berms and Impoundments

I have also performed sampling on the site in an initial site investigation last spring. Among other contaminants, I found that the site contains polynuclear aromatic hydrocarbons (PAHs). This contamination is widespread throughout the site. In fact, 70% of all the samples I collected contained PAHs in excess of the remediation standard. Two of the samples had benzo(a)pyrene contamination that was 300 times the New Jersey non-residential remediation standard. These results confirmed previous investigations performed by NJDEP and the NJ Turnpike Authority that also identified PAH contamination in excess of the remediation standards (See Figure 2).

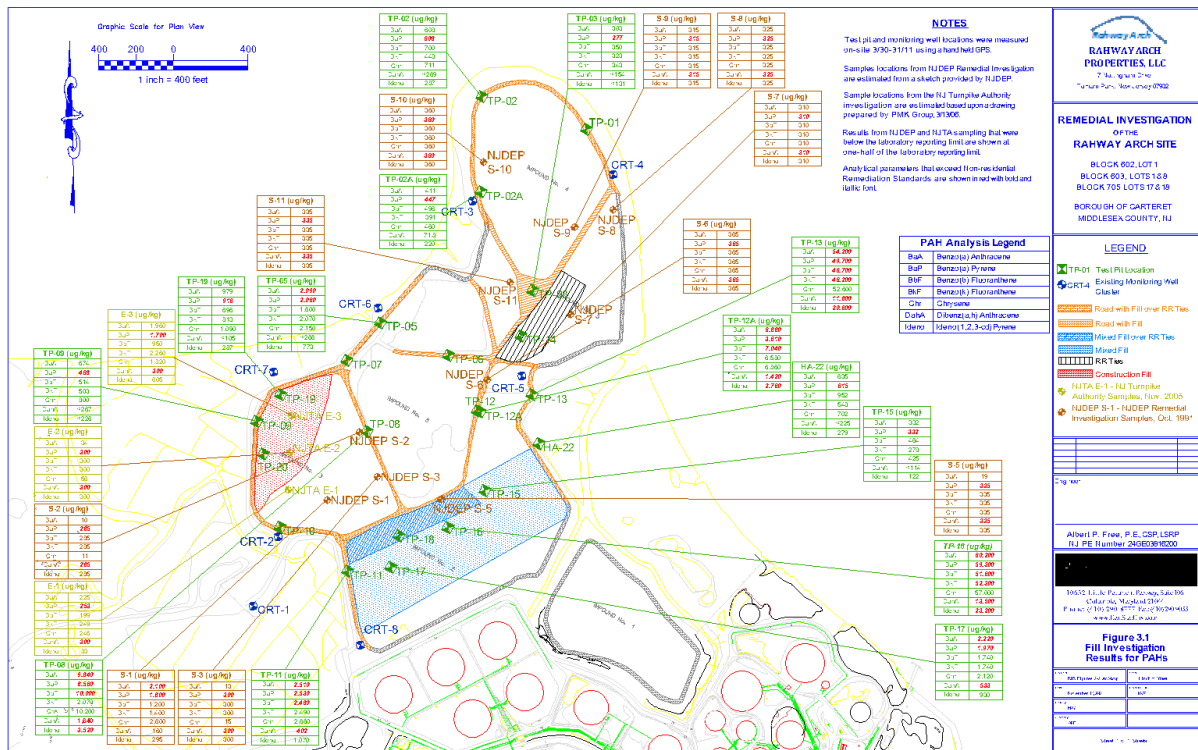


Figure 2 - PAH Results from the Fill Investigation

Most recently, we collected samples of the alum-YPS sludge and rainwater that had accumulated in several of the impoundments. We analyzed those samples for cyanide and heavy metals. The cyanide concentration in the sludge was up to 120 times the Impact to Groundwater Standard. More telling were the water samples, which had been clean rainwater before coming in contact with the sludge. The cyanide concentration in those samples was up to 300 times the surface water quality criteria for the Rahway River. Metals found in the water and sludge that exceeded criteria included arsenic, copper, lead, manganese, mercury and thallium.

Besides the environmental problems, the site is also as safety concern. The alum-YPS sludge has no shear strength and is incapable of supporting loads. A person or animal entering the site could easily sink into this material, without warning. More importantly though, is the condition of the berms. These berms were installed in the 1930s on the existing meadow mat. Over time, as water has seeped through them, they have weakened. Without proper maintenance, they will collapse, releasing the sludge and all of its contaminants into the surrounding wetlands and the Rahway River.

So the obvious question is how do we fix this problem? We need to accomplish several tasks to remediate this site. Specifically:

- ❑ We need to stop the bleeding now by preventing water from seeping through the contaminants
- ❑ We need to prevent direct exposure to the contaminants
- ❑ We need to eliminate the safety concerns

- We need to stabilize the berms, and
- We need to make this property usable.

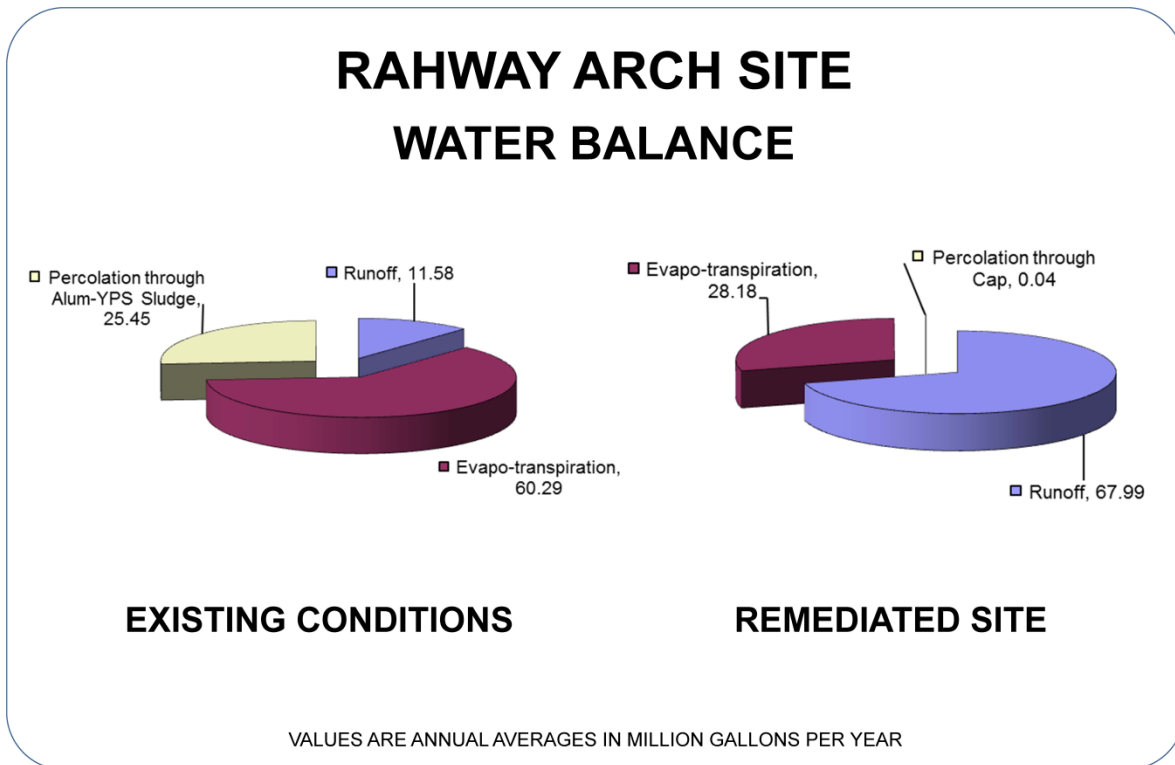
The Site Remediation Reform Act (SRRA) requires the owners to remediate the site. As an LSRP, SRRA and its regulations require me to develop a remediation plan that meets all of these goals to ensure that the plan is properly implemented.

The only practical solution to solve all of these issues is to cap and grade the contaminated areas with a manufactured engineered fill that has structural properties and can overcome the lack of shear strength in the sludge. The engineered fill must also have low permeability to force the precipitation to run off rather than percolate through the contaminants.

The **ONLY** purpose of Soil Safe's Metro12 Class B Recycling Facility will be to manufacture that engineered fill. The Facility will accept recyclable ID-27 soil, blend and screen this soil and then mix it with metered additives to manufacture the necessary soil-cement product. My past experience working with this product at other sites in New Jersey has shown that it has high shear strength and low permeability. It can bridge soft areas and can be placed in engineered lifts and compacted to create a useable site.

As the LSRP, I will be responsible for approving the manufactured engineered fill used in the cap. This includes meeting the requirements of the approved remediation workplan, making sure that no new contaminants are brought onto the site, ensuring that the cap material is cleaner than the existing conditions and making sure that the engineered fill is placed properly to accomplish the remedial goals.

The low permeability of the engineered fill, along with design of the cap will promote runoff and evapotranspiration over percolation. Remember I said that under the current conditions 25 million gallons of water percolate through the contaminants. As illustrated on this chart, after the cap is in place percolation will be 40,000 gallons per year. That is a 99.2% reduction that will prevent these contaminants from migrating into the groundwater. (See Figure 3).



**Figure 3 - Water Balance Before and After Remediation**

the interested stakeholders. Right now, the 125 acre site consists of approximately 40 acres of wetlands and 85 acres of waste. In its current condition, it is not acceptable to anyone. After remediation, the 40 acres of wetlands will remain; but the waste area will be generously converted to 60-65 acres of upland habitat and 25-25 acres of commercially developable property. (See Figure 4).

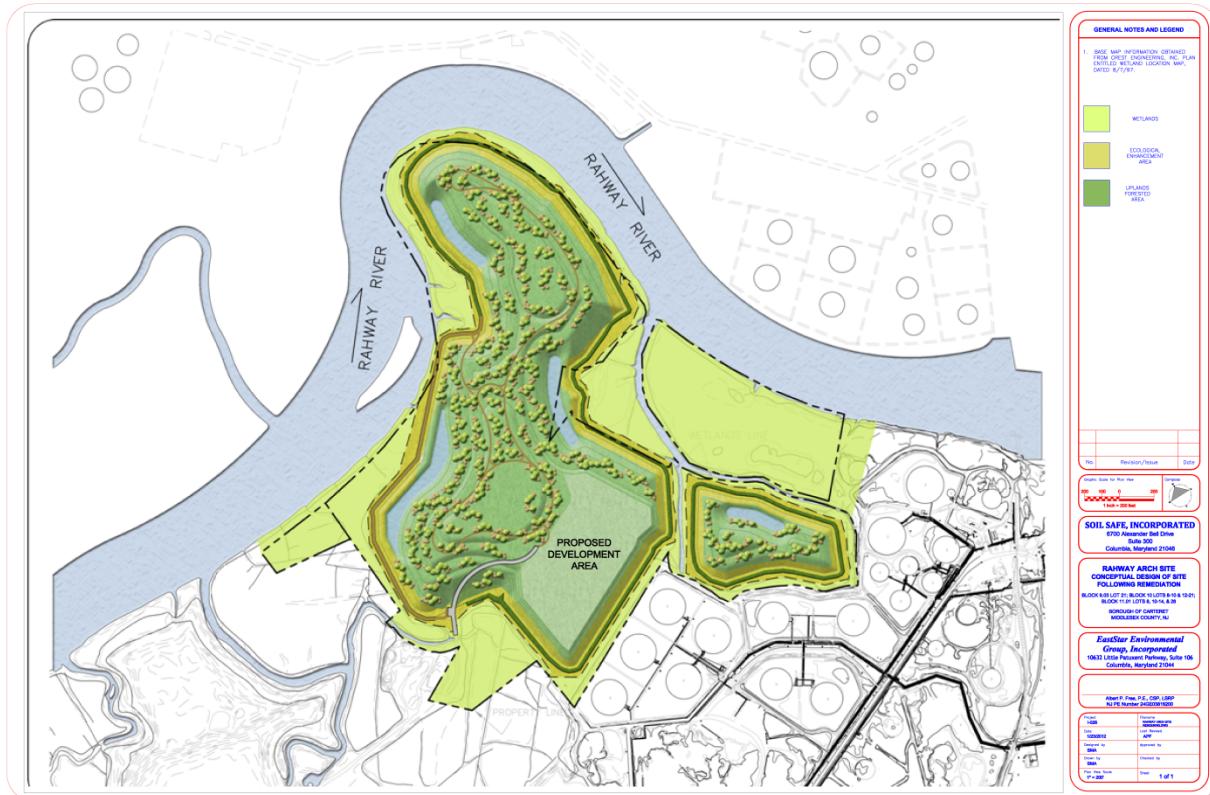


Figure 4 - Conceptual Rendering of Remediated Site

As the LSRP, I must follow the rules for the site remediation established by SRRA, the Administrative Requirements for Remediation of Contaminated Sites (ARRCS) and the Tech Rule.

Specific in the Tech Rule is that I review any previous remediation activities conducted at a site and all sampling data. I must determine that any previous remedies, including remedies previously approved by DEP, to determine that they remain protective of public health safety and the environment. The fact that a no further action (NFA) letter has been issued for a site does not relieve me of this requirement.

These Rules also require me to prepare, certify and submit to DEP the following documents:

- Notice of LSRP Retention (Opt-in)
- Preliminary Assessment
- Case Inventory Document
- Receptor Evaluation
- Site Investigation
- Remedial Investigation Report
- Remedial Action Workplan
- Remedial Action Report (following completion of the remediation)

- ❑ Remedial Action Permits for both soil and groundwater (following completion of the remediation)
- ❑ Response Action Outcome (following issuance of the remedial action permits)

The remediation must proceed within a timely manner. Mandatory and regulatory time frames have been established by ARRCS and the Tech Rule for completion of certain of these tasks. The penalties for failing to meet these time frames are significant.

Once the Response Action Outcome has been issued, the engineering and institutional controls established as part of the remedial action must be monitored and maintained. A biennial certification will be required to document that these controls remain protective of human health, safety and the environment.

To summarize, this site is highly contaminated. Some of the contaminants of concern include cyanide, PAHs and heavy metals. The site also poses significant risks to human health, safety and the environment. The proposed remediation project, using manufactured engineered fill from the proposed Soil Safe Class B Recycling Facility, will alleviate these problems, bring the site in compliance with SRRA and result in a usable property that will be a valuable asset to Middlesex County, the Borough of Carteret and the environment.