



About: Environmental Products and Applications

- Over 25 years in business
- Have successfully treated over 15,000 acres of mine tailings
- Proprietary Blend Codes
- Manufacturers of Envirotac line of polymers
- Envirotac II, received the moniker "Rhino Snot" when it was deployed in Camp Rhino to combat dust.

Acrylic Polymers

- ▶ Environmentally safe
- ▶ Applies out of anything that sprays water
- ▶ 98% Effective at controlling dust
- ▶ Great Tensile Strength
- ▶ Dries odorless
- ▶ Applications last for years
- ▶ UV resistant
- ▶ Cost effective


The Need to Control Fugitive Dust

Particulate Matter (PM10 & PM2.5)

- ▶ What is it?
- ▶ Particulates that are suspended in the air and can be breathed deep into the lungs
- ▶ Particle size of 10 Microns or less
- ▶ Larger particulate falls out of the air quickly, while PM10 & 2.5 emissions remain suspended in the air

How does it effect us?

- ▶ Particulate Matter of 10 microns or less can be lodged deep in the lungs, and due to absorption the particulate can reach the blood stream unfiltered, and can cause serious health problems
- ▶ The effects of inhaling Particulate Matter that have been widely studied in humans and animals and include: asthma, lung cancer, cardiovascular disease, respiratory diseases, premature delivery, birth defects, premature death.



Effects of Fugitive Dust on a Mine Site

Its more than just a nuisance-

- Reduced visibility, safety hazard.
- Health effects on humans and wildlife.
- Increases the need for maintenance on equipment.
- Increases carbon footprint, via constantly running water trucks and spraying water.
- Costly fines.
- Negatively impacts image to surrounding communities.

How acrylic polymers control dust

- ▶ When applied acrylic polymers will penetrate into the soil. Upon curing it will bond the soil particles with a nano polymerized grid. This will "laminates" the soil particles in place and prevent the soil from becoming airborne.




Specialized Tailing Equipment



Metal leaching and Acid Rock Drainage (ARD)

- ▶ Rain and snow can turn the fine rock and soil deposits acidic and leach off to water sources such as streams or ground water reserves. Also rain and snow may leach metal salts into water supplies.



Why use an acrylic polymer to mitigate or prevent Metal leaching and ARD.

- ▶ Acrylic polymers will coat soil and rock particles in a plastic resin film preventing water from saturating the particles.
- ▶ Acrylic polymers will keep the soil and rock particles in place and prevent migration



C-Factor Results: <0.001

per- ASTM D 6459 Standard Test Method For Determination of Rolled Erosion Product (RECP) Performance in protecting Hillslopes From Rainfall-Induced Erosion




Case Study: Hazardous Soils Dust Control

Washington Closure Hanford




- ▶ The Hanford site is a 586 square mile area located in southeastern Washington. The site once hosted various national weapon complexes and at its peak consisted of over 16 active major facilities. While in operation these activities contaminated soils with radioactive materials such as Plutonium and Uranium. It is now one of the largest nuclear cleanup efforts in the world. Environmental Products & Applications was called to eliminate fugitive dust throughout the site with the use of Acrylic Polymers.


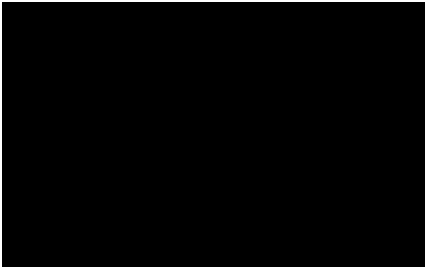


Active Operations at the Hanford site included:

- ▶ Spraying all inactive areas to prevent fugitive dust.
- ▶ Spraying active areas to limit the dust being generated.
- ▶ Spraying slopes to prevent sediment loss.
- ▶ Spraying Road ways to prevent dust, potholing, ruts, and other common problems presented when soils are not stabilized.



Kennecott Utah Copper



Envirotac ideal for growing vegetation on Tailings

- Germination 2-5 days earlier
- Reduction in soil losses due to strong precipitation
- Presented more than 20% higher germination in grasses
- Prevention of sediment losses due to wind erosion



David Johnson-FHI

- Has used Envirotac II for over 17 years on tailings, stock piles, and access roads.





Surface Spray holds up to high winds as shown by the United States Military

Rhinos of MMS-374 Slather National Forest in Snot
 RT: 00:01:48
 Video by: Jeremy Fishell
 Story and Edit by: MCI Christopher Okula
 Organization: Naval Surface Warfare Center, Corona Division
 SBI: Marine Col. Patrick Gramaglia,
 Commanding Officer, Marine Aircraft Group 16

Questions?
 Contact: MCI Okula @ christopher.okula@navy.mil




Mine Haul Roads



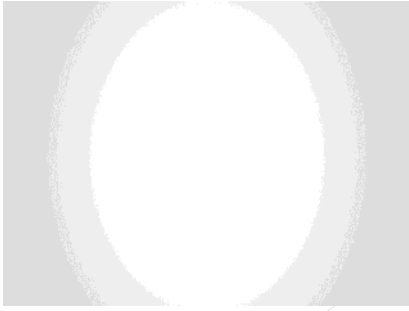


Benefits for Haul Roads

- Increase compaction
- Increases load bearing weight
- Repels Water
- Not Slippery When Wet
- Eliminates need to Re-grade








Texas Commissioners





Roadway Slope Stabilization / Erosion Control


Testing the Science

- Based on the results of testing using simulated wheel loading on soils treated with the dust suppressants and the field application the following conclusions can be made:
- Envirotac II From Environmental Products was the most effective dust control product, showing a 97% improvement over the untreated baseline.






In-house soils lab



Available Worldwide



Thank You!

John Vermillion
Jeremiah Vermillion

Environmental Products and Applications
La Quinta California

