

About: Environmental Products and Applications

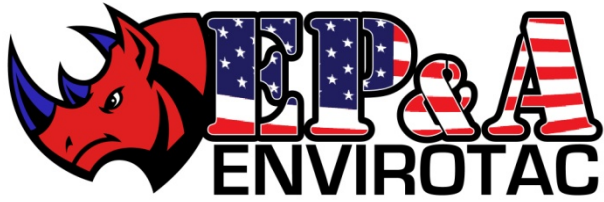
- Over 25 years in business
- Have successfully treated over 15,000 acres of mine tailings
- Proprietary Blend Codes
- Manufacturers of Envirotac line of polymers
- Envirotac II, received the moniker “Rhino Snot” when it was deployed in Camp Rhino to combat dust.



Acrylic Polymers

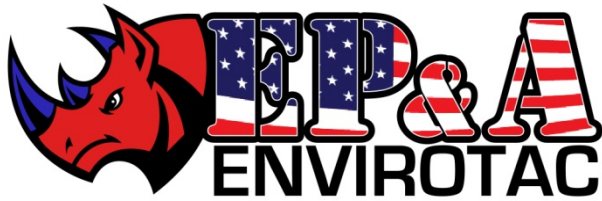
- ▶ Environmentally safe
- ▶ Applies out of anything that sprays water
- ▶ 98% Effective at controlling dust
- ▶ Great Tensile Strength
- ▶ Dries odorless
- ▶ Applications last for years
- ▶ UV resistant
- ▶ Cost effective





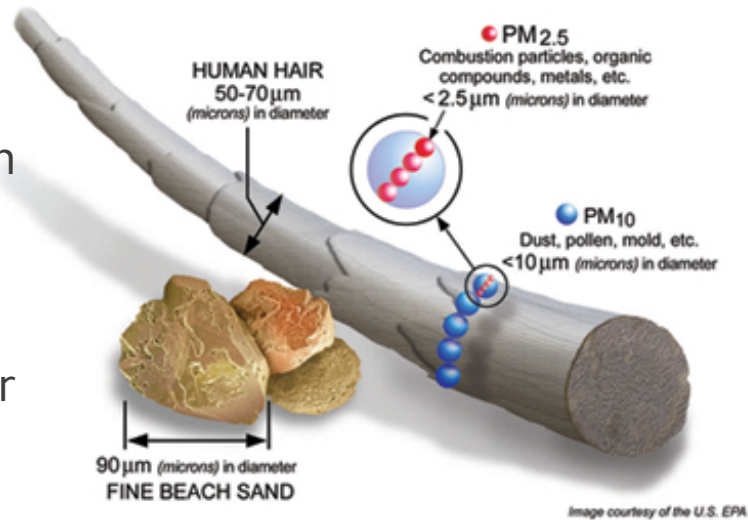
The Need to Control Fugitive Dust

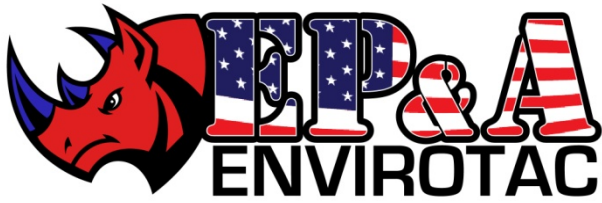




Particulate Matter (PM10 & PM2.5)

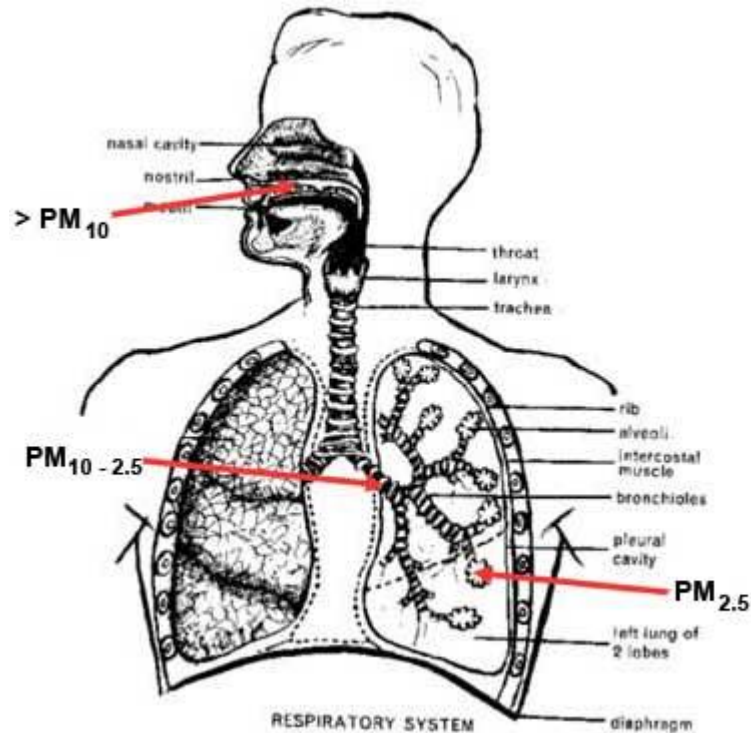
- ▶ What is it?
- ▶ Particulates that are suspended in the air and can be breathed deep into the lungs
- ▶ Particle size of 10 Microns or less
- ▶ Larger particulate falls out of the air quickly, while PM10 & 2.5 emissions remain suspended in the air

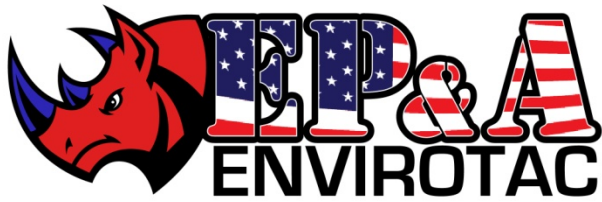




How does it effect us?

- ▶ 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



Product Mixed at 8:1 Ratio with Water



Mixture Sprayed at 1 gallon / 10 sf



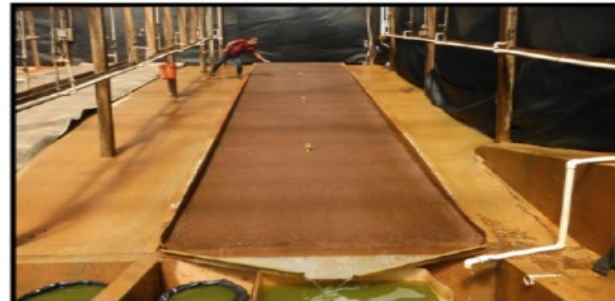
Start of Test



After 2"/hr Rain



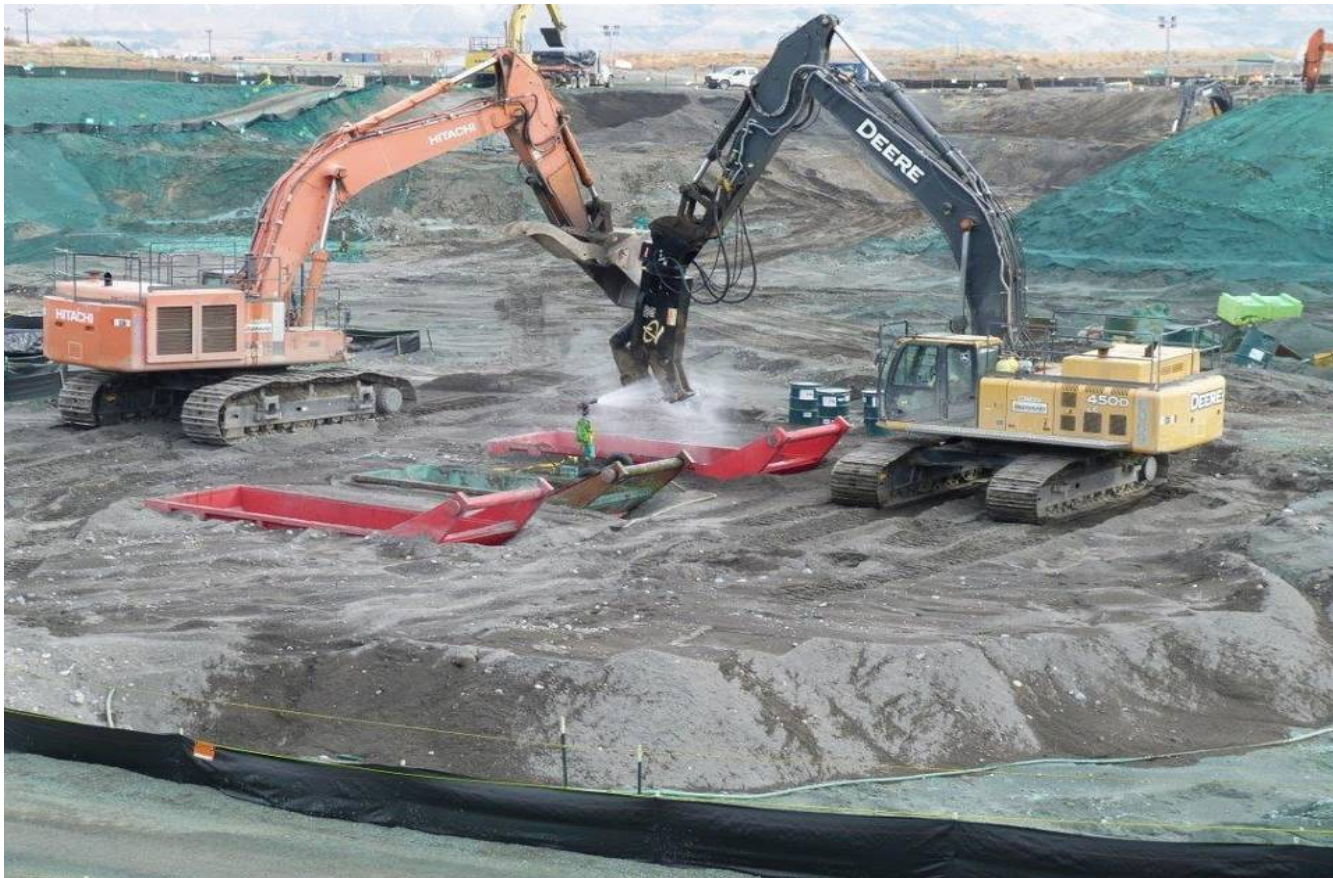
After 4"/hr Rain



After 6"/hr Rain

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.



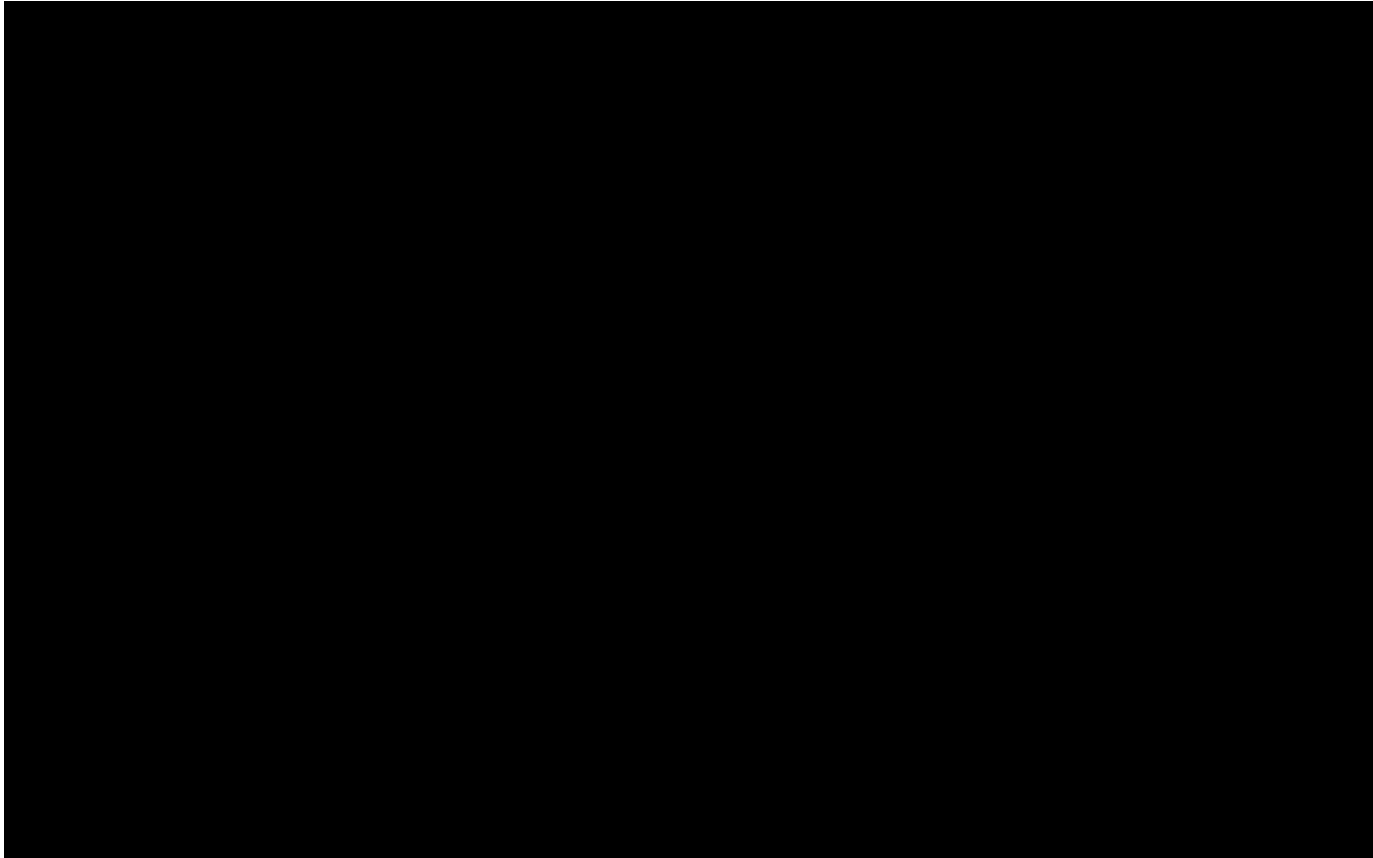
Active Operations at the Hanford site included:

- ▶ 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





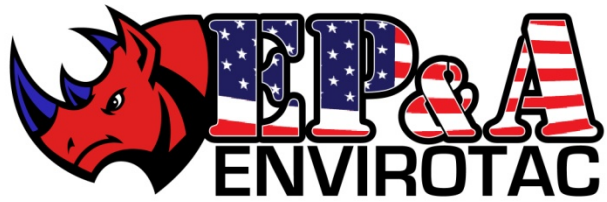
Envirotac ideal for growing vegetation on Tailings

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 MWSS-374 Slather National Forest in Snot
RT: 00;01;48
Video by: Jeremy Fishell
Story and Edit by: MC1 Christopher Okula
Organization: Naval Surface Warfare Center, Corona Division
SB1: Marine Col. Patrick Gramuglia,
Commanding Officer, Marine Aircraft Group 16

Questions?
Contact: MC1 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.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
Port Hueneme, California 93043-4370

**Site Specific Report
SSR-2343-ENV**


**EVALUATION OF DUST SUPPRESSION
PRODUCTS CONDUCTED FOR THE
MARINE CORPS AIR GROUND COMBAT
CENTER, TWENTYNINE PALME, CA**

by

G. Anguiano
R. Sandoval
T. Webb

November 1997

Distribution authorized to U.S. Government agencies only; test and evaluation; November 1997.
Other requests shall be referred to Naval Facilities Engineering Services Center.

 Printed on recycled paper



In-house soils lab





Available Worldwide



Thank You!

John Vermillion

Jeremiah Vermillion

Environmental Products and
Applications

La Quinta California

