

EARTHBIND™ STABILIZER PRODUCT OVERVIEW

Earthbind™ Stabilizer is a quality, versatile bituminous modified biopolymer soil stabilization agent. Earthbind™ Stabilizer was developed to meet the need for a quality and cost-effective soil stabilizer and dust palliative that can be safely stored and easily applied.

Earthbind™ Stabilizer works by binding loose soil or aggregate particles together, strengthening and water-proofing the soil/aggregate matrix. In addition, Earthbind™ Stabilizer will not re-solubilize in rainwater after curing.

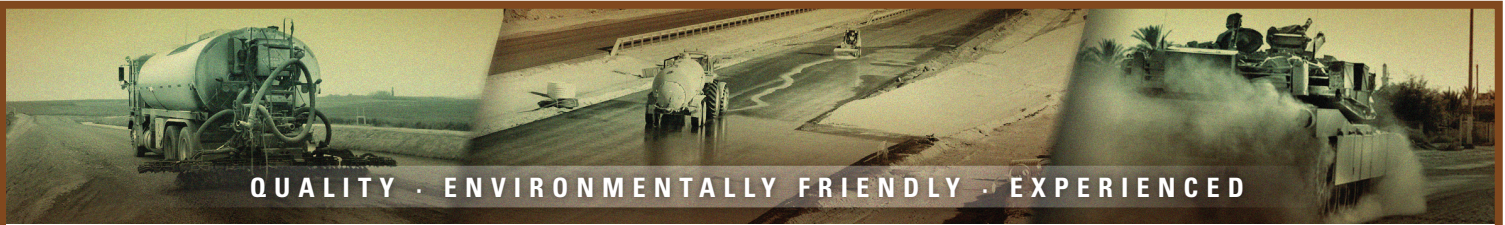
Earthbind™ Stabilizer is sold and transported in a concentrate and is diluted with water prior to application. Earthbind™ Stabilizer has been used to stabilize and control dust on the surface, base and sub-bases of unpaved roads, parking lots, and other road bases for the industrial, mining, military, private, and public market sectors.

As a soil stabilizer Earthbind™ Stabilizer provides:

- Increased density
- Increased stability
- Water proofing
- Decreased aggregate replacement costs
- Decreased grading costs
- Simple application using a water truck or pressurized distributor truck
- Easy clean-up – washes off of equipment and vehicles before curing

As a dust palliative Earthbind™ Stabilizer provides:

- Superior dust cohesion and suppression
- Efficient dust control under a variety of conditions
- Excellent penetration of road surface without pre-watering
- Applies quickly without road closures using a water truck or pressurized distributor truck
- Easy clean-up – washes off of equipment and vehicles before curing



RECOMMENDED EARTHBIND™ APPLICATION PROCEDURE FOR STABILIZATION

Earthbind™ is sold and shipped in concentrate and diluted with water prior to application. For a typical unpaved municipal, county, or state road, Earthbind™ is diluted to make a 4:1 solution (20%). Depending upon environmental conditions, Earthbind™ can be diluted from a 1:1 (water: product concentrate) to 6:1 solution. When the soil material is near optimum moisture, a 1:1 or 2:1 dilution can be used.

The amount of Earthbind™ Stabilizer concentrate that is required to effectively stabilize an unpaved road varies based on the:

- Type of road aggregate material
- Climatic conditions
- Type, number, and velocity of vehicles
- Road geometry
- Road surface conditions

Following are the recommended amounts of concentrate for stabilization:

- For a 4" stabilization, 0.25-gallons of concentrate per square yard of road;
- For a 6" stabilization, 0.35-gallons of concentrate per square yard;
- For a 8" stabilization, 0.45-gallons of concentrate per square yard;
- For a 10" stabilization, 0.55-gallons of concentrate per square yard; and
- For a 12" stabilization, 0.65-gallons of concentrate per square yard.

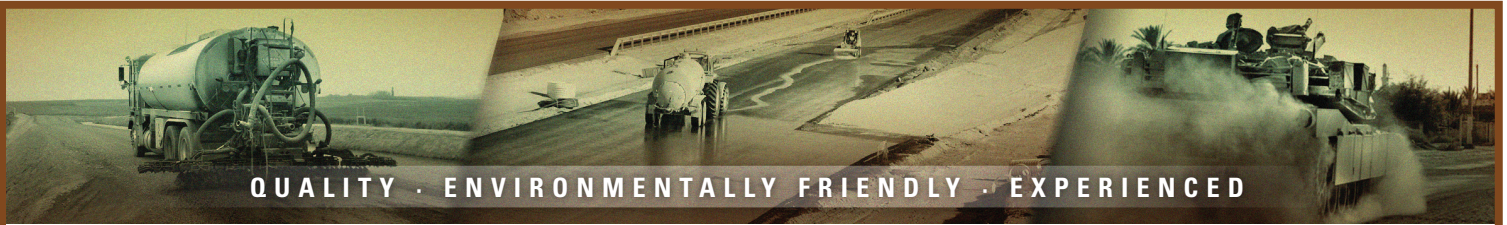
TYPICAL STABILIZATION PROCEDURE

There are several procedures for in-depth stabilization depending upon the available equipment and depth of stabilization. Using a road grader, the road is initially graded to a 4" depth. Afterwards, 0.5-gallons of a 4:1 solution (20% by volume) of Earthbind™ is then applied to the road surface. This solution is then bladed into the soil and windrowed back and forth several passes to mix. Afterwards, another 0.5-gallon of a 4:1 solution is applied and windrowed to mix. Next, the treated road is profiled with the motor grader, compacted with a roller, and top shot with 0.25-gallons of a 4:1 Earthbind™ solution.

When stabilizing a road 6" to 12" in-depth an asphalt reclaimer/stabilizer with a liquid injection system is required. The diluted Earthbind™ Stabilizer is injected onto the road aggregate and tilled into the road bed simultaneously. Afterwards, the stabilized road is profiled with a motor grader and compacted with a drum roller. Next, the road surface is top shot with a 0.25-gallon solution of Earthbind™. This top shot will put a final touch on the road by binding any material on the surface of the road and preventing dust generation. This top shot can serve as a prime coat prior to paving with asphalt.

RECOMMENDED EQUIPMENT

- Computerized asphalt reclaimer/stabilizer with product injection system or motor grader
- Motor grader to profile road after product application;
- Drum roller with mist system to compact road after stabilization process;
- Storage tank(s) with enough capacity to store product;
- Storage tank equipped with a circulation system (to mix product and pump product into distributor truck); and
- Computerized distributor truck or water truck that can accurately apply 0.25-gallons of solution per square yard for final top shot.



RECOMMENDED EARTHBIND APPLICATION PROCEDURE FOR DUST CONTROL

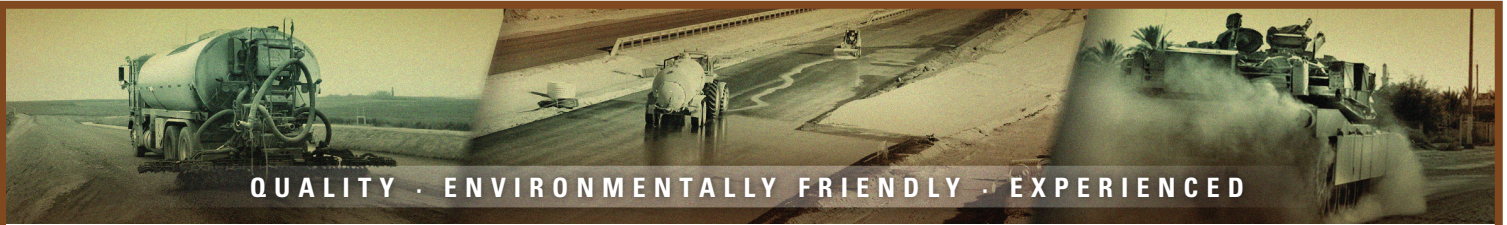
Earthbind™ is sold in a concentrated form that is diluted with water prior to application. It can be used at water-to-product concentrations of 3:1 to 12:1 depending on the soil type, traffic flow and other environmental factors. Some soil types require only a one-time heavy application while others require several light applications. Our experts can recommend the appropriate concentration given your situation.

For maximum results, Earthbind™ is best applied with a CRC spreader bar, but can also be applied with a water truck. The thickness of the application and depth of its penetration into soil can be controlled by varying the concentration levels and the total volume of product used.

Earthbind™ is appropriate for use on soils, roads, parking lots, mining areas and other environments where dust needs to be controlled. It can also be used as a soil compacting agent.

RECOMMENDED EQUIPMENT FOR DUST CONTROL APPLICATIONS

The size and scope of your dust control project will determine which equipment is right for you. We recommend a computerized distributor or water truck for large jobs. Smaller jobs can be completed with any delivery system that has the capability to saturate the surface with Earthbind™ solution.



EARTHBIND™ STABILIZER SAFETY INFORMATION

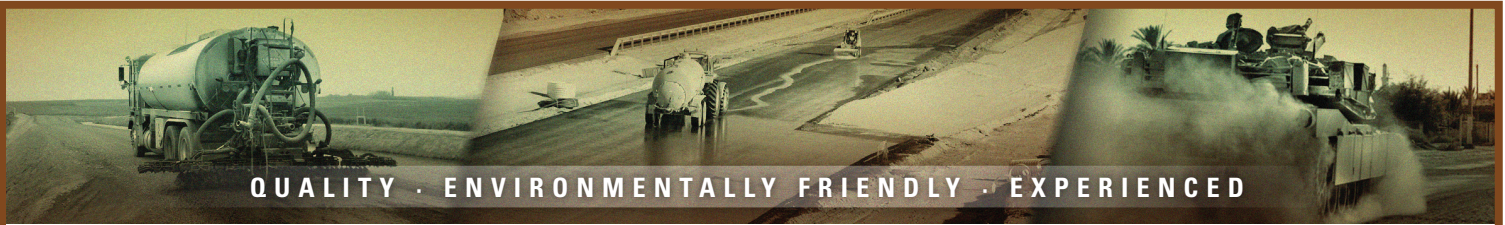
With trends continuing towards strict health, safety and environmental regulations, Earthbind™ is an efficient and effective method to reduce dust-related environmental and health concerns. Plus, it aids in complying with clean air and water requirements by reducing airborne dust and preventing erosion.

Traditional dust control products are made of potentially carcinogenic petroleum oils and are diluted in highly volatile and flammable solvents. Others contain chemicals that are reported to be corrosive to metal, vehicles or other equipment that may come into contact with the treated areas. Some contain soluble anions that are harmful to aquatic organisms or become absorbed by plant roots. Once absorbed, anions are transported to leaves and twigs where they eventually accumulate to toxic levels. Anions can also raise the osmotic concentration of the soil, thereby diminishing the availability of water to plant roots and retarding metabolic functions, photosynthesis and growth.

Other dust control products are water-soluble. Rainfall can cause the product to wash-off into surface waters. When the product reaches these waterways, it reduces light penetration and can lead to the reduction of photosynthesis by phytoplankton, lowering the oxygen balance and interfering with aquatic life.

Earthbind™ is a safe, long-lasting and economical solution for base stabilization, dust and erosion control. The individual components of Earthbind™ are not considered to be carcinogenic. When recommended application and handling procedures are followed, Earthbind™ is considered to be safe to humans and the environment. Once applied and with adequate time to cure, Earthbind™ is resistant to water and does not re-emulsify when it rains.

- When used properly, Earthbind™ is:**
- Non-flammable
 - Non-corrosive to metal
 - Non-hazardous waste
 - Not considered to be harmful to aquatic and mammal life
 - Not considered to be carcinogenic



SUMMARY OF SAMPLE/TEST INFORMATION FOR EARTHBIND™ STABILIZER FISH TOXICITY

Client Name: EnviRoad LLC

Test Material: Earthbind™ Stabilizer

EPA Test Number: EPA-821-R-02-012

Test Species: Oncorhynchus mykiss (rainbow trout)

TEST CONCENTRATION (PPM)	96-HOUR SURVIVAL RATE BY PERCENT
Control	100
10	100
100	100
250	100
500	100
1,000	100
5,000	0
96-Hour LC ₅₀ as ppm product	2,240

Client Name: EnviRoad LLC

Test Material: Earthbind™ Stabilizer

EPA Test Number: EPA-821-R-02-012

Test Species: Pimephales promelas (fathead minnow)

TEST CONCENTRATION (PPM)	96-HOUR SURVIVAL RATE BY PERCENT
Control	100
10	100
100	100
250	100
500	100
1,000	95
5,000	30
96-hour LC ₅₀ as ppm product	3,420



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MATERIAL SAFETY DATA SHEET EARTHBIND™ PRODUCTS

Quick Identifier: Modified Biopolymer Emulsion

Manufacturer's Name: EnviRoad LLC

Address: 2606 N. Newark St.
Portland, Oregon 97217

Other Information Calls: 800-536-2650

IDENTITY - SECTION I

Trade Name and Earthbind™ 100, Earthbind™ Stabilizer,
Earthbind™ Watertruck, Earthbind™ Prime,
Earthbind™ HydroTac

CAS Number: Mixture

Chemical Name: N/A

NFPA Hazardous Identification

Health: 1

Fire: 0

Reactivity: 0

0 - Least

1 - Slight

2 - Moderate

3 - High

4 - Extreme

COMPOSITION INFORMATION ON INGREDIENTS - SECTION II

INGREDIENTS		%	OSHA PEL	ACGIH TLV
Bitumen	Proprietary	10-60	NE	NE
Stabilizer	Proprietary	5-30	NE	NE
Emulsifier	Proprietary	<6.0	NE	NE
Water	7732-18-5	Balance	NE	NE

Additional Comments: Though further detail on contents may be confidential, all pertinent hazards are addressed in this MSDS.

PHYSICAL & CHEMICAL CHARACTERISTICS - SECTION III

Boiling Point	>100 C
Vapor Pressure (mm Hg)	NA
Percent Volatile by Volume	NA
Solubility in Water	Complete
Specific Gravity (H2O=1.00)	1.01 to 1.05
Vapor Density (air@1)	NA
Evaporation Rate (H2O = 1)	NA
Reactivity in Water	None
Viscosity @ 77°F SFS	20-450
Appearance and Odor	Dark Brown Liquid; Bitumen and molasses odor
Additional Comments	Material is a bitumen/water emulsion and will not combust until water is driven off.

Legend: NE = None Established
ND = No Data Available
NA = Not Applicable



FIRE AND EXPLOSION HAZARD DATA - SECTION IV

Flash Point	NA
Flammable Limits in Air % by Volume	(bitumen/water emulsion)
Extinguisher Media	Dry Chemical, CO2, Halon, Water Spray, or standard foam
Fire Fighting Procedures	Move containers from fire area if possible. Cool fire-exposed containers with water from side until well after fire is out. Stay away from storage tank end for massive fire in storage area. Use unmanned hose holder or monitor. Use flooding amounts of water as a fog, as solid streams may be ineffective. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage vessel due to fire. Extinguish only if flow can be stopped. Water or foam may cause frothing. Avoid breathing toxic vapors and keep upwind.
Additional Comments	Material is a bitumen/water emulsion and will not ignite until water is driven off.

REACTIVITY DATA - SECTION V

Stability/Conditions to Avoid	Material is stable under normal temperature and pressure. Do not expose to prolonged heating above 100C.
Incompatibility/Materials to Avoid	None
Hazardous Polymerization/ Conditions to Avoid	None
Hazardous Byproducts of Decomposition	Thermal decomposition may release hazardous gases.

HEALTH HAZARD DATA - SECTION VI

Route of Entry	Legend: A: Health Effect; B: Personal Protection; C: Emergency First Aid Procedures
Inhalation	<p>A. Avoid prolonged inhalation of vapors or mist. Product has a low vapor pressure and is not expected to present an inhalation hazard at ambient conditions.</p> <p>B. Provide exhaust ventilation system to meet published exposure limits.</p> <p>C. Remove victim from exposure to fresh air immediately. If breathing has stopped, give artificial respiration. Keep victim warm and at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.</p>



HEALTH HAZARD DATA - SECTION VI - (CONTINUED)

- Skin**
- A. Direct contact with hot fumes may cause slight skin irritation. Repeated or prolonged exposure to fumes may cause irritation, dermatitis, and acne-like lesions.
 - B. Employee must wear appropriate protective impervious clothing, gloves, and equipment to prevent repeated or prolonged skin contact.
 - C. If contact is not with hot materials, remove contaminated clothing and shoes. Wash affected area with soap or mild detergent, and large amounts of water until no evidence of material remains. Burns from contact with hot material should be treated like thermal burns.

- Ingestion**
- A. May cause nausea, gastro-intestinal irritation, and vomiting.
 - B. Do not induce vomiting.
 - C. Treat symptomatically and supportively. Get medical attention immediately. If vomiting occurs, lower head to prevent aspiration.

- Eyes**
- A. Contact with eyes may cause redness and irritation. Repeated or prolonged exposure to fumes may cause conjunctivitis.
 - B. Employee must wear splash-proof or dust-resistant safety goggles or face shield.
 - C. Wash eyes immediately with large amounts of water. Lift upper and lower lids until no evidence of material remains (15 to 20 minutes). Cover with sterile bandages. Get medical attention immediately.

Medical Conditions Aggravated by Exposure

No adverse reactions expected at concentrations normally encountered.

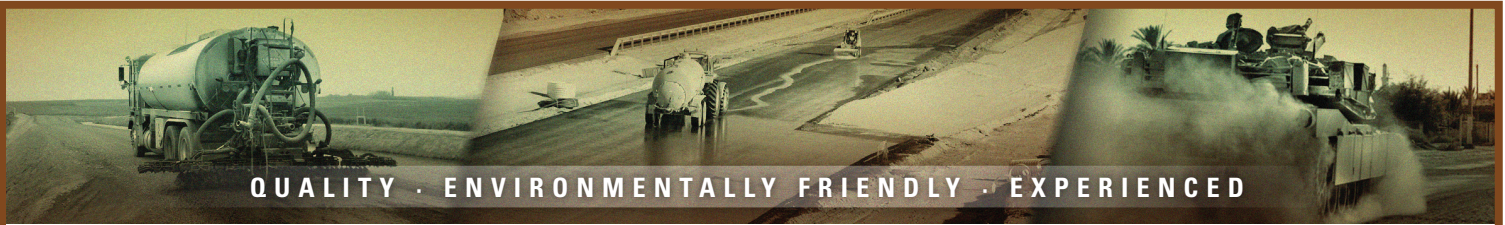
SAFE USAGE INFORMATION - SECTION VII

Handling, Storage & Other Precautions

This product is not classified as hazardous under DOT reg. Keep away from heat, sparks, and oxidizing agents. Keep container closed when not in use. Observe all Federal, State and Local regulations when handling, storing or disposing of this material.

Action to be Taken in Case of Spill or Release (Including Disposal)

Shut off area ignition sources. Stop leak if it can be done without risk. Use water spray to reduce vapors. For small spills, use absorbent material and place into container. Dike ahead of large spill for later disposal. Prohibit smoking in affected area. Isolate area and restrict entry.



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CONTROL MEASURES - SECTION VIII

Ventilation Requirements Provide exhaust ventilation system to meet published exposure limits.

Work Hygiene Practices

Respirator Selection of respiratory protection must be based upon the airborne level of suspected contaminant. Levels found in the work place must not exceed the working limit of the respirator utilized.

Dermal Workers must wear appropriate protective clothing, gloves, and equipment to prevent repeated or prolonged contact with skin.

Eyes Proper eye/face protection must be utilized to protect against splashes and vapors.

Carcinogenicity Not listed as a carcinogen by IARC, TSCA, NTP, OSHA or ACGIH

TRANSPORTATION - SECTION IX

D.O.T. Proper Shipping Name (49 CFR 172.101) Non-hazardous Emulsion

D.O.T. Hazard Class (49 CFR 172.101) NA

UN / NA Code (49 172.101) NA

Packaging Group (49 172.101) NA

Bill Of Lading Description (49 172.101) Non-hazardous Emulsion

D.O.T. Labels Required (49 172.101) NA

D.O.T. Placards Required (49 172.101) NA

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