



**ENVIRONMENTAL  
PRODUCTS, LLC™**

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[www.LSCenv.com](http://www.LSCenv.com)

800-800-7671

# LSC California Team



**Vincent Randolph**  
**Regional Sales Manager**



# LSC Family of Products



# Background of Polyacrylamides (PAM)

- ▶ Polyacrylamides (PAM) large linear-chain polymer
- ▶ Anionic PAM has a negative charge and can be used in erosion control BMP and Passive Treatment applications under Construction General Permit (CGP)
- ▶ Cationic PAM has a positive charge and can not be used in erosion control BMP and Passive Treatment. Is used in active treatment processes.
- ▶ Anionic PAM is biodegradable
- ▶ Commonly used in furrow farming irrigation agriculture, food processing, and drinking water treatment due to its low toxicity

# Anionic PAM in Erosion Control Applications



- ▶ Decreases soil detachment
- ▶ Maintains soil structure and preserves pore space
  - ▶ Allows for water infiltration
  - ▶ Allows Microbes to breathe
  - ▶ Anionic PAM will not create a crust
- ▶ Flocculates suspended sediment
- ▶ Activated by water, performance improved by agitation



USDA Approved/EPA Recommended

**This is your irrigated furrow.**

**This is your furrow on PAM!**

The image shows a side-by-side comparison of furrows. The left furrow is filled with muddy water, while the right furrow is filled with clear water. In the center, two sediment traps are shown, with the left one containing a large amount of sediment and the right one containing very little. The USDA logo is in the bottom left, and the 'd2s' logo is in the bottom right.

USDA  
Northwest Irrigation and Soils Research Laboratory, Kimberly, Idaho

d2s





# Construction General – Erosion Control BMP

- ▶ EarthGuard® products will be considered erosion control BMPs in the new California construction general permit. These sprayed on applications are applied to soils for erosion and sediment control.
- ▶ Passive application is used to reduce turbidity in discharges. EarthGuard® treats soil while passive treatment solutions treat unclean water.

ORDER WQ 2022-0057-DWQ  
NPDES No. CAS000002

## II.D. Erosion Control

II.D.1. Dischargers shall implement the following practices to eliminate or minimize site erosion. Erosion control BMPs (except for sprayed products) shall be available on-site or at a nearby location (e.g., common lay-down yard), year-round with trained persons able to deploy the product under the direction of the Qualified SWPPP Practitioner:

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NPDES No. CAS000002

discharger shall consider the use of plastic materials resistant to solar degradation;

- I. Control stormwater and non-stormwater discharges to minimize downstream channel and bank erosion; and
- m. Control peak flowrates and total volume of stormwater and authorized non-stormwater discharges to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

II.D.2. Dischargers that stabilize soil using bonded-fiber matrices, hydromulches, spray tackifiers, or other land-applied products shall:

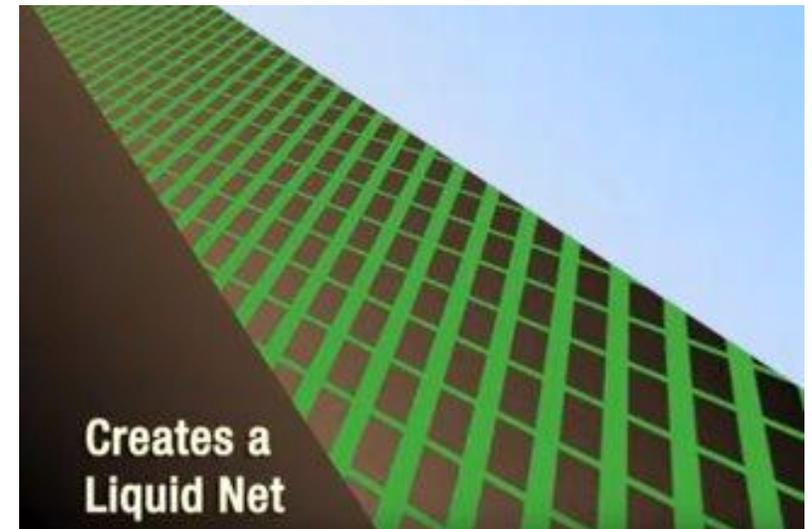
- a. Apply the product according to the manufacturer's instructions and guidance; and
- b. Apply the product according to the manufacturer's guidance to allow for ample cure time and to prevent treatment chemicals from being transported by runoff.





# How EarthGuard® Works

1. Creates a liquid net
  - ▶ EarthGuard® molecules attach to soil particles & create an invisible net that stabilizes the soil

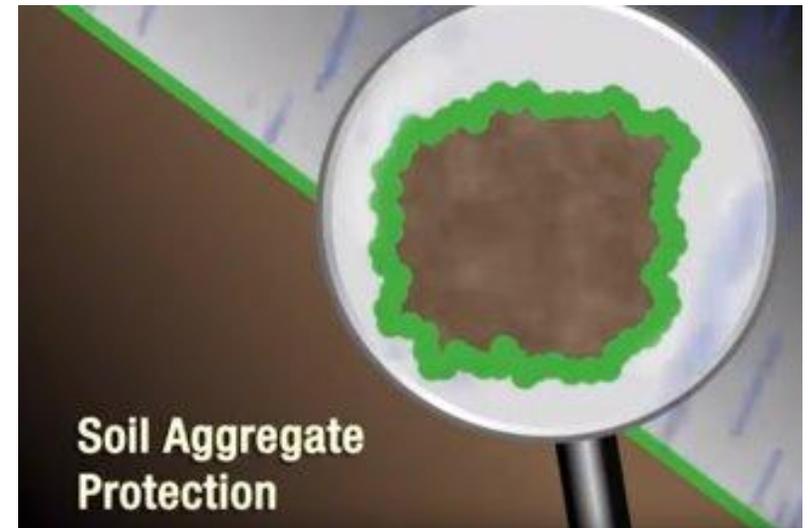




# How EarthGuard® Works

## 2. Soil Aggregate Protection

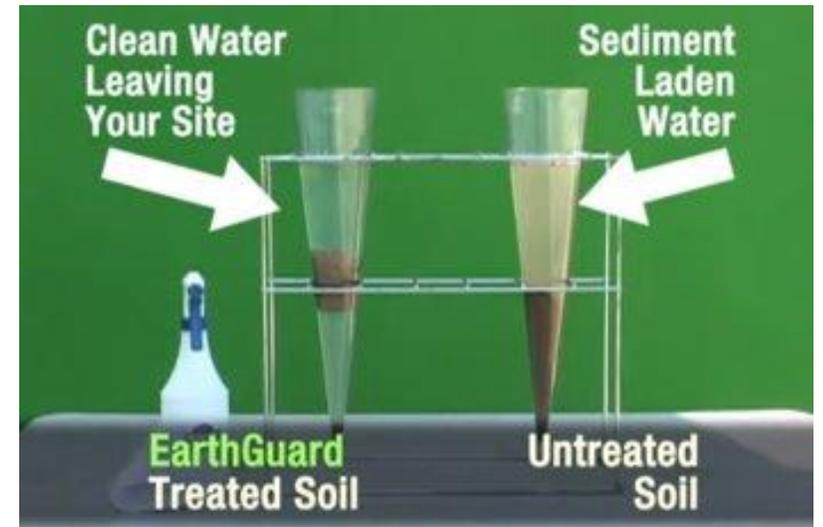
- ▶ EarthGuard® engulfs soil particles & keeps them whole



# How EarthGuard® Works

## 3. Flocculates Suspended Sediments

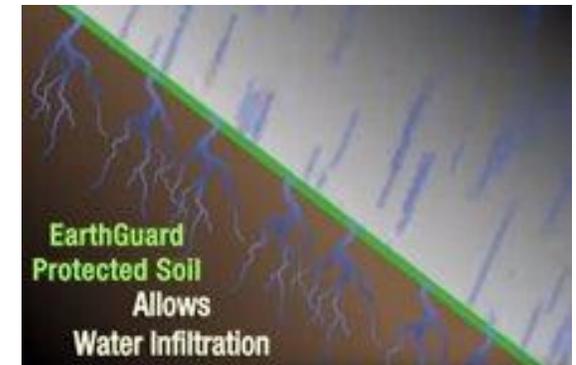
- ▶ Soil particles flocculate and drop, allowing clean water to leave the site



# How EarthGuard® Works

## 4. Controls Splash Erosion

- ▶ When applied with mulch (like Edge™ or EarthGuard® Fiber Matrix™) the combination creates a buffer to prevent splash erosion



# Product Overview

The LSC logo is a stylized green leaf shape with the letters 'LSC' in white inside.

|                    |                                                                                   |                                                                                    |                                 |
|--------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------|
| <b>Liquid</b>      |  |  | Maximum formulation flexibility |
| <b>Pellets</b>     |  |  | Maximum application flexibility |
| <b>Fiber Mulch</b> |  |  | Maximum durability              |

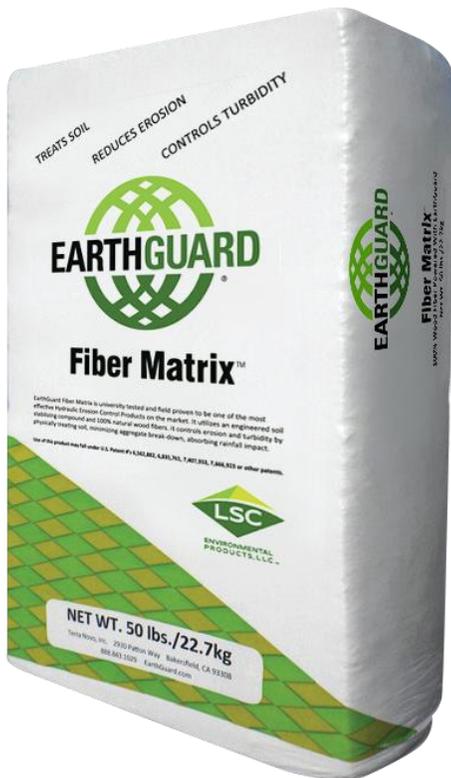
## General uses and application

- Re-vegetation
- Erosion Control
- Slope stabilization
- Turbidity and total suspended solids (TSS) control
- Site winterization
- Post-Fire ash containment and re-vegetation





# Product Overview





# EarthGuard® Liquid

| Application Methods                                                                                                             | Uses                                                                                                                                                                                                                                                               | Benefits                                                                                                                                                                                  | Packaging                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Water Truck</li><li>• Jet agitated hydroseeder</li><li>• Standard hydroseeder</li></ul> | <ul style="list-style-type: none"><li>• Mix onsite with any hydro-mulch to improve durability</li><li>• Direct application for Turbidity and TSS control... Perfect for instantaneous site stabilization</li><li>• Temporary slope or site stabilization</li></ul> | <ul style="list-style-type: none"><li>• Maximum formulation flexibility</li><li>• Dramatically improves any mulch performance</li><li>• Easy to inventory</li><li>• Easy to use</li></ul> | <ul style="list-style-type: none"><li>• 5 Gallon Containers</li><li>• 32 Containers / Pallet</li><li>• Minimum order quantity: 5 Gallon Container</li></ul> |



**Turbidity & TSS Control:  
EarthGuard® Rain Event Action Plan**



**Re-vegetation / Erosion Control / Slope Stabilization:  
EarthGuard® Liquid + your choice of Mulch**



# Temporary Erosion Control: Storm by Storm



## Temporary Erosion and Dust Control – Up to 4" of Rain

| Slope      | EarthGuard® | Water (gal/ac)*                                                                                                                                                   |
|------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ≤ 4:1      | 3 gal/ac    | As required to properly cover 1 acre of area:<br><ul style="list-style-type: none"> <li>• Spray Rig ≥ 1500 gal/ac</li> <li>• Water Truck ≥ 2000 gal/ac</li> </ul> |
| 3:1        | 4 gal/ac    |                                                                                                                                                                   |
| 2:1        | 5 gal/ac    |                                                                                                                                                                   |
| 1.5:1      | 6 gal/ac    |                                                                                                                                                                   |
| 1:1        | 8 gal/ac    |                                                                                                                                                                   |
| Stockpiles | 10 gal/ac   |                                                                                                                                                                   |

# Site Winterization: Flat Pads/Backyard Stabilization



| Time        | EarthGuard <sup>®</sup> † | Water (gal/ac)*                                                                                                                                             |
|-------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-2 months  | <b>3-5</b> gal/ac         | As required to properly cover 1 acre of area: <ul style="list-style-type: none"><li>• Spray Rig ≥ 1500 gal/ac</li><li>• Water Truck ≥ 2000 gal/ac</li></ul> |
| 2-3 months  | <b>5-8</b> gal/ac         |                                                                                                                                                             |
| 3-6 months  | <b>8-10</b> gal/ac        |                                                                                                                                                             |
| 6-12 months | <b>10-15</b> gal/ac       |                                                                                                                                                             |



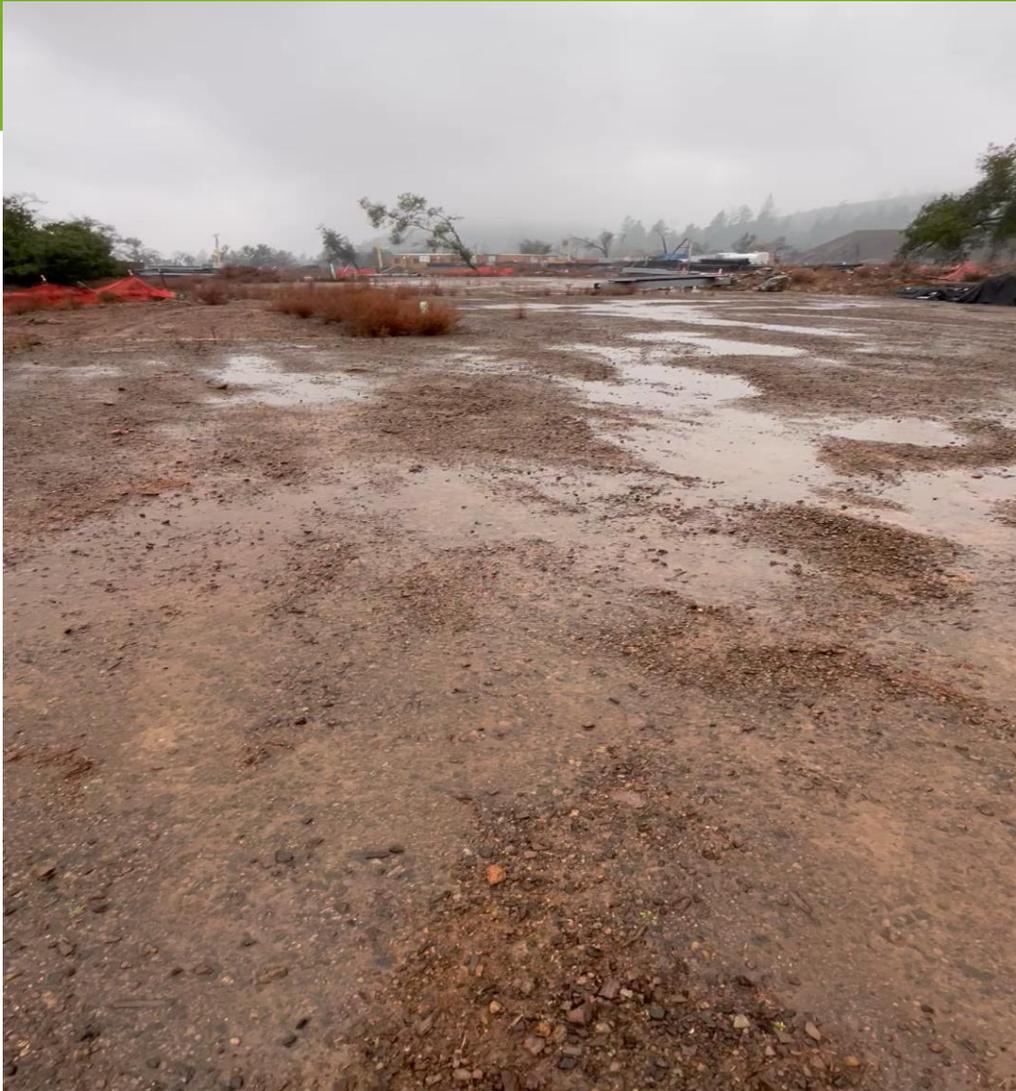
# Storm by Storm Application





# Extended Coverage Application







# Sediment Control

- ▶ EarthGuard® Soil Stabilizer
  - ▶ Mixes with water and apply to construction sites
  - ▶ Reduces turbidity
  - ▶ Keeps runoff water clean!



**Treated**



**Not Treated**



# BMP Roundup





# EarthGuard® Fiber Matrix

| Application Methods                                                               | Uses                                                                                                                                                                                                                         | Benefits                                                                                                                                                                                                                                   | Packaging                                                                                                                                                                |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Standard paddle mix hydroseeder</li></ul> | <ul style="list-style-type: none"><li>• Re-vegetation</li><li>• Erosion control</li><li>• Slope stabilization</li><li>• Site winterization</li><li>• Post fire ash containment</li><li>• Turbidity and TSS control</li></ul> | <ul style="list-style-type: none"><li>• Best measured performance</li><li>• Less than ½ the installed cost of most rolled mats with better performance</li><li>• Creates perfect micro-environment for growth and sustainability</li></ul> | <ul style="list-style-type: none"><li>• 50 lb. bale</li><li>• 40 bales / pallet</li><li>• 20-22 pallets / truckload</li><li>• Minimum order quantity: 1 pallet</li></ul> |



**Erosion Control – Temporary Stabilization/Site Winterization**



**Revegetation/Dormant Seeding**



**Revegetation/Slope Stabilization**



# Proven: Caltrans Testing



## 2:1 Slope Testing

LA County 10 yr. Storm



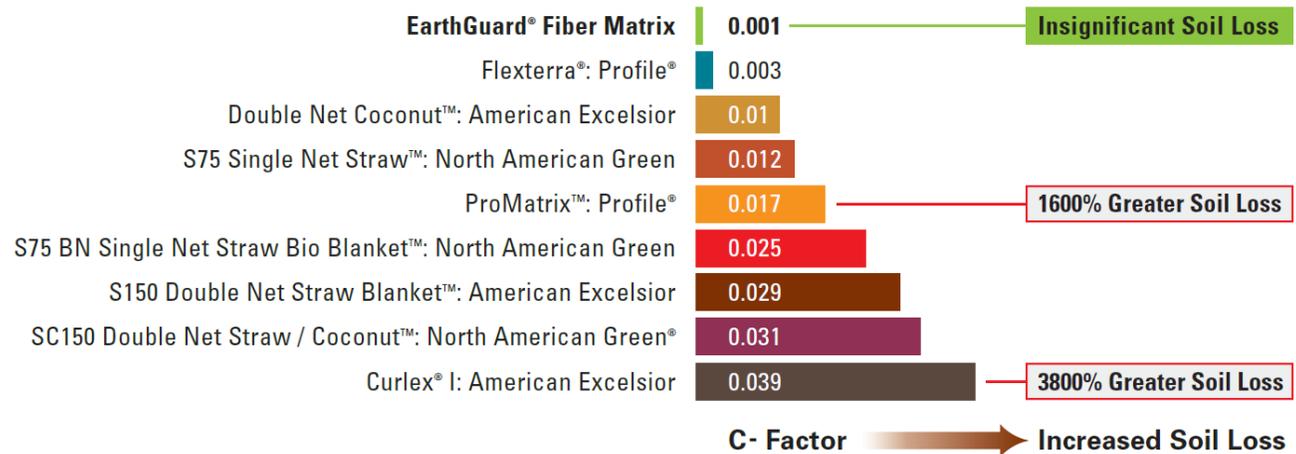
**99.5% Effective**  
After Two Consecutive  
Rain Events



# Proven: AASHTO/NTPEP ASTM 6459 EarthGuard Testing



## NTPEP ASTM 6459 Soil Loss Testing: 1 Hour – 4" Event



0/6/2025



# Application Rates

| Normal Conditions: Maximum Rainfall of < 20" (480 mm) before adequate vegetative establishment |                |                 |              |              |              |              |                |              |
|------------------------------------------------------------------------------------------------|----------------|-----------------|--------------|--------------|--------------|--------------|----------------|--------------|
|               | ≤ 4 to 1 Slope |                 | 3 to 1 Slope |              | 2 to 1 Slope |              | ≥ 1 to 1 Slope |              |
|                                                                                                | Per Acre       | Per Ha          | Per Acre     | Per Ha       | Per Acre     | Per Ha       | Per Acre       | Per Ha       |
| <b>EarthGuard Fiber Matrix</b>                                                                 | 1500<br>LB     | 1680<br>KG      | 1800<br>LB   | 2020<br>KG   | 2000<br>LB   | 2245<br>KG   | 3000<br>LB     | 3355<br>KG   |
| <b>OR</b>                                                                                      |                |                 |              |              |              |              |                |              |
| <b>EarthGuard Liquid</b>                                                                       | 4-6<br>GALS    | 37-56<br>LITERS | 7<br>GALS    | 66<br>LITERS | 8<br>GALS    | 75<br>LITERS | 10<br>GALS     | 94<br>LITERS |
| <b>Mulch</b>                                                                                   | 1500<br>LB     | 1680<br>KG      | 1800<br>LB   | 2020<br>KG   | 2000<br>LB   | 2245<br>KG   | 3000<br>LB     | 3355<br>KG   |

| Severe Conditions: Maximum Rainfall of > 20" (480 mm) before adequate vegetative establishment |                |              |              |              |                |              |
|------------------------------------------------------------------------------------------------|----------------|--------------|--------------|--------------|----------------|--------------|
|              | ≤ 5 to 1 Slope |              | 4 to 1 Slope |              | ≥ 3 to 1 Slope |              |
|                                                                                                | Per Acre       | Per Ha       | Per Acre     | Per Ha       | Per Acre       | Per Ha       |
| <b>EarthGuard Fiber Matrix</b>                                                                 | 2000<br>LB     | 2245<br>KG   | 2500<br>LB   | 2800<br>KG   | 3000<br>LB     | 3355<br>KG   |
| <b>OR</b>                                                                                      |                |              |              |              |                |              |
| <b>EarthGuard Liquid</b>                                                                       | 6<br>GALS      | 56<br>LITERS | 8<br>GALS    | 75<br>LITERS | 10<br>GALS     | 94<br>LITERS |
| <b>Mulch</b>                                                                                   | 2000<br>LB     | 2245<br>KG   | 2500<br>LB   | 2800<br>KG   | 3000<br>LB     | 3355<br>KG   |



# EathGuard® Fiber Matrix



January 2024



February 2024



# EarthGuard® Liquid with Mulch





# Site Winterization



## Application Rates:

**Normal Conditions:** Maximum Rainfall of < 20" (480 mm) before adequate vegetative establishment

|  | <b>≤ 4 to 1 Slope</b> |            | <b>3 to 1 Slope</b> |            | <b>2 to 1 Slope</b> |            | <b>≥ 1 to 1 Slope</b> |            |
|-------------------------------------------------------------------------------------|-----------------------|------------|---------------------|------------|---------------------|------------|-----------------------|------------|
|                                                                                     | Per Acre              | Per Ha     | Per Acre            | Per Ha     | Per Acre            | Per Ha     | Per Acre              | Per Ha     |
| <b>EarthGuard Fiber Matrix</b>                                                      | 1500<br>LB            | 1680<br>KG | 1800<br>LB          | 2020<br>KG | 2000<br>LB          | 2245<br>KG | 3000<br>LB            | 3355<br>KG |





# Site Winterization - Slopes



## Application Rates:

**Normal Conditions:** Maximum Rainfall of < 20" (480 mm) before adequate vegetation establishment

| EARTHGUARD              | ≤ 4 to 1 Slope |            | 3 to 1 Slope |            | 2 to 1 Slope |            | ≥ 1 to 1 Slope |            |
|-------------------------|----------------|------------|--------------|------------|--------------|------------|----------------|------------|
|                         | Per Acre       | Per Ha     | Per Acre     | Per Ha     | Per Acre     | Per Ha     | Per Acre       | Per Ha     |
| EarthGuard Fiber Matrix | 1500<br>LB     | 1680<br>KG | 1800<br>LB   | 2020<br>KG | 2000<br>LB   | 2245<br>KG | 3000<br>LB     | 3355<br>KG |





# Stockpile Protection - Stockpiles



## Application Rates:

**Normal Conditions:** Maximum Rainfall of < 20" (480 mm) before adequate vegetation establishment

| EARTHGUARD                     | ≤ 4 to 1 Slope |            | 3 to 1 Slope |            | 2 to 1 Slope |            | ≥ 1 to 1 Slope |            |
|--------------------------------|----------------|------------|--------------|------------|--------------|------------|----------------|------------|
|                                | Per Acre       | Per Ha     | Per Acre     | Per Ha     | Per Acre     | Per Ha     | Per Acre       | Per Ha     |
| <b>EarthGuard Fiber Matrix</b> | 1500<br>LB     | 1680<br>KG | 1800<br>LB   | 2020<br>KG | 2000<br>LB   | 2245<br>KG | 3000<br>LB     | 3355<br>KG |



# Spring/Fall Seeding

Initial Application: June 2010



Pictures Taken: May 2011



Drainage Swale



Impoundment Embankment



Top Soil Pile



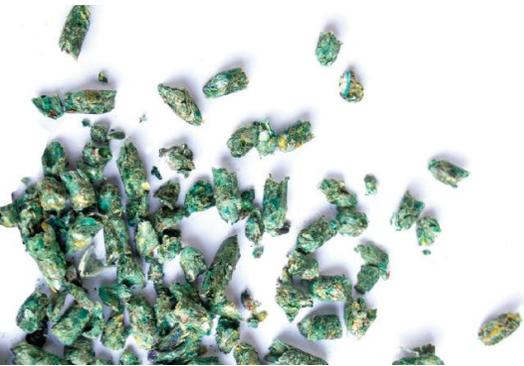
Well Pad Embankment



# EDGE™ – EarthGuard® Pellets



| Application Methods                                                                                                                                                                            | Uses                                                                                                                                                                                                                                                        | Benefits                                                                                                                                                                                                                                      | Packaging                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Hand application</li><li>• Broadcast spreader</li><li>• Jet agitated hydroseeder</li><li>• Standard hydroseeder</li><li>• Aerial application</li></ul> | <ul style="list-style-type: none"><li>• Re-vegetation / Erosion control</li><li>• Slope stabilization</li><li>• Site winterization</li><li>• Post fire ash containment</li><li>• Turbidity and TSS control</li><li>• Temporary site stabilization</li></ul> | <ul style="list-style-type: none"><li>• Maximum application flexibility</li><li>• Saves time and labor – More solids per load</li><li>• Ideal for remote locations w/ limited/no access to water</li><li>• Easy to handle and store</li></ul> | <ul style="list-style-type: none"><li>• 50 lb. bag<br/>40 bags / pallet</li><li>• 1,000 lb. bulk sack<br/>2 sacks / pallet<br/>44 sacks / truckload</li><li>• Minimum order quantity:<br/>50 lb. bags - 1 pallet<br/>Bulk sacks – 1 pallet</li></ul> |



EDGE™ contains EarthGuard® science, corn-stover, and premium recycled paper



The logo for LSC, consisting of the letters 'LSC' in white, bold, sans-serif font, centered within a green diamond shape that has a white swoosh above it.

# EDGE™ – EarthGuard® Pellets

## Applied Dry

- ▶ Pellet Form – can be applied by hand, mechanically, or air-dropped
- ▶ Effective in:
  - ▶ Remote areas
  - ▶ Areas with limited water access
  - ▶ Frozen ground
  - ▶ Fire reclamation

## Applied Wet

- ▶ Sprayed through hydraulic applicator



**EDGE**™  
EARTHGUARD® PELLETS



# EDGE™ – EarthGuard® Pellets



## Application Rates – Hydraulic Application

**NORMAL CONDITIONS: Maximum Rainfall of < 20" (480 mm) Before Adequate Vegetative Establishment**

|  | ≤ 4 to 1 Slope |            | 3 to 1 Slope |            | 2 to 1 Slope |            | ≥ 1 to 1 Slope |            |
|-------------------------------------------------------------------------------------|----------------|------------|--------------|------------|--------------|------------|----------------|------------|
|                                                                                     | Per Acre       | Per Ha     | Per Acre     | Per Ha     | Per Acre     | Per Ha     | Per Acre       | Per Ha     |
| <b>Edge™</b>                                                                        | 1500<br>LB     | 1680<br>KG | 1800<br>LB   | 2020<br>KG | 2000<br>LB   | 2245<br>KG | 3000<br>LB     | 3355<br>KG |





# EDGE™ : Easy Loading





# EDGE™ is Easily Applied



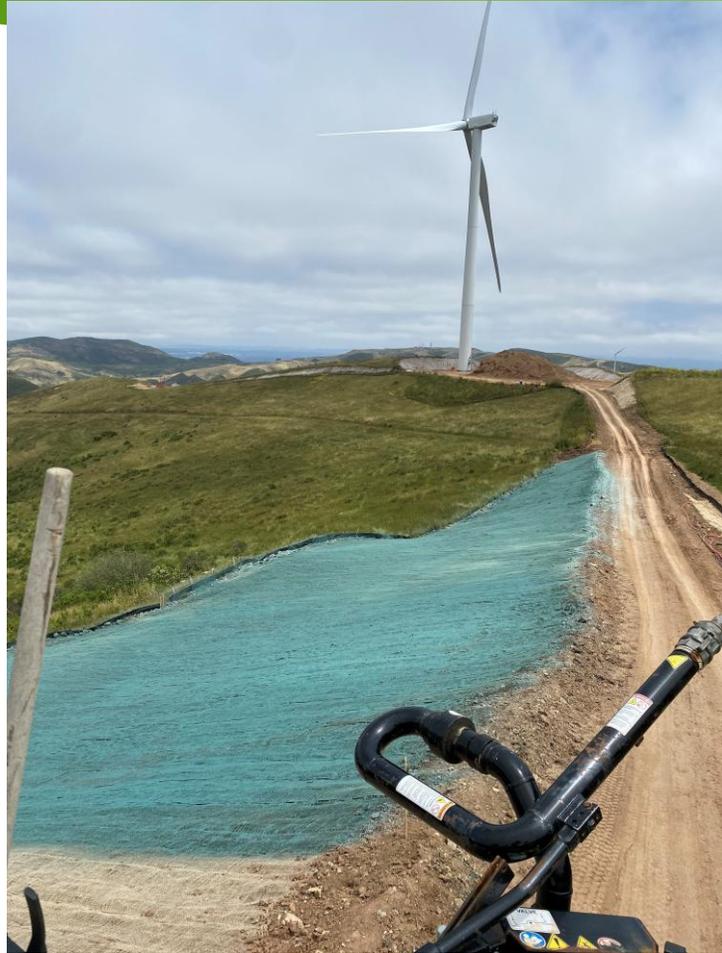
## Application Rates – Dry Application

|  Edge™ | ≤ 4 to 1 Slope |         | 3 to 1 Slope |         | ≥ 2 to 1 Slope |         |
|------------------------------------------------------------------------------------------|----------------|---------|--------------|---------|----------------|---------|
|                                                                                          | Per Acre       | Per Ha  | Per Acre     | Per Ha  | Per Acre       | Per Ha  |
|                                                                                          | 3000 LB        | 3355 KG | 3500 LB      | 3925 KG | 4500 LB        | 5045 KG |





# Wind Farm Applications



# EDGE™ Pellets – Dry Applied Before Rain Activation



# EDGE™ Pellets – Dry Applied After Rain Activation



# EDGE™ EarthGuard® Pellets vs Straw Blanket





# Solar Applications



# EDGE™ – Remote Application



# Santa Rosa Post Fire Erosion and Sediment Control



# 2022 Construction General Permit Passive Treatment - Attachment G



- ▶ Passive treatment is the application of natural or synthetic chemicals and products **to reduce turbidity in discharges** through coagulation and flocculation. Passive treatment does not rely on computerized, enclosed systems with pumps, filters, and real-time controls.
- ▶ The discharger shall maintain a copy of the site-specific **Passive Treatment Plan** in the Stormwater Pollution Prevention Plan (SWPPP).
- ▶ Stormwater treated with passive treatment products in a treatment zone prior to being discharged from the construction site shall pass through a sediment control BMP (including, but not limited to, a sediment basin or trap) or filter (including, but not limited to, sand filter or geotextile bag) to settle or remove flocculants prior to discharge from the site.

# 2022 Construction General Permit Passive Treatment



- ▶ Anionic chemicals are authorized for use in passive treatment systems, typically consisting of polyacrylamides<sup>2</sup>. Passive treatment consisting of polyacrylamides must:
  - ▶ Be free of nonylphenol and nonylphenol ethoxylates, often used as surfactants in emulsion-based products. Emulsion-based products may contain surfactants and petroleum distillates that can be toxic to aquatic life;<sup>3</sup>
  - ▶ Be food grade (National Sanitary Foundation/American National Standards Institute) products, or contain less than 0.05 percent residual monomer by volume;<sup>4</sup>
  - ▶ Have a charge density between 10 and 55 percent by weight;
  - ▶ Have a molecular weight between 6 and 25 milligrams per mole; and
  - ▶ Be mixed and applied in accordance with Occupational Safety and Health Administration Safety
- ▶ The discharger shall include in the Passive Treatment Plan, current acute and chronic toxicological test data provided by the manufacturer, a laboratory employed by the manufacturer, or a third-party organization.

# Passive Treatment Solutions

- ▶ Sediment Control Products (Passive Treatment)
- ▶ Place in channelized flow areas
  - ▶ Upper end of drainage channel
  - ▶ Near earthmoving activities of active construction
- ▶ Turbidity and Total Suspended Solids (TSS) reduction
- ▶ Acceleration of settling rate in detention/sediment ponds
- ▶ Packaged in sleeve netting, replace when necessary



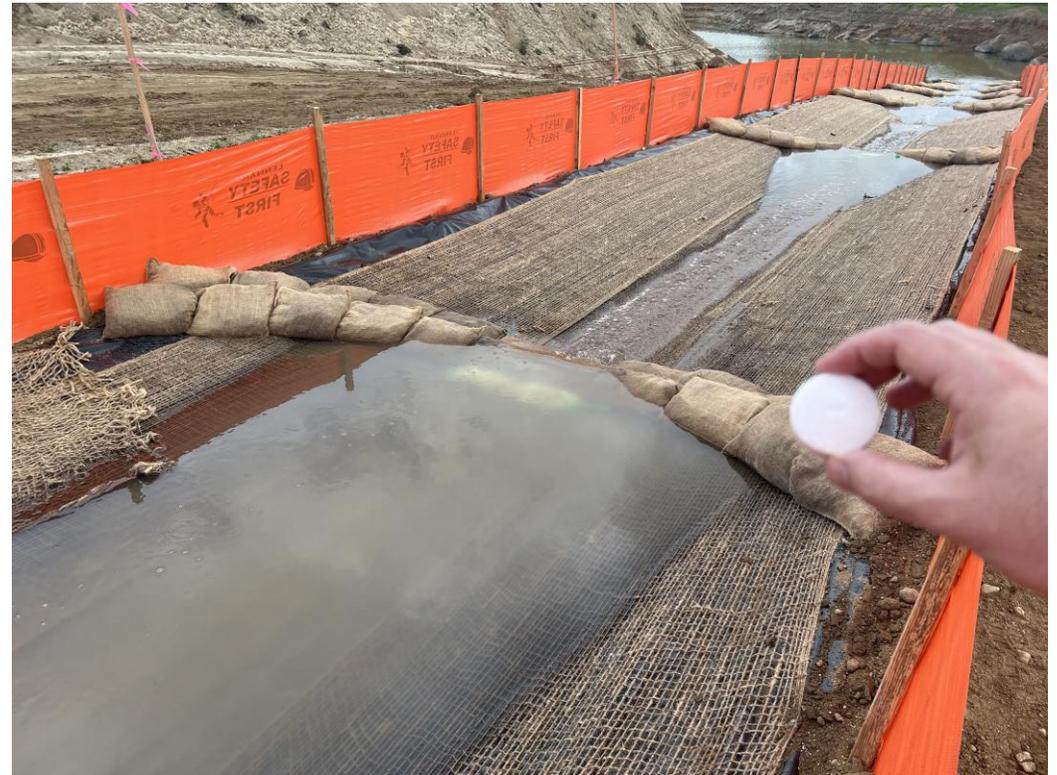


# EarthBOUND® Floc Rolls and Tabs





# EarthBOUND® Floc Rolls and Tabs



Thank You!



# Questions



|                           |                                                                                    |                                                                                      |                                        |
|---------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------|
| <p><b>Liquid</b></p>      |   |   | <p>Maximum formulation flexibility</p> |
| <p><b>Pellets</b></p>     |   |   | <p>Maximum application flexibility</p> |
| <p><b>Fiber Mulch</b></p> |  |  | <p>Maximum durability</p>              |

**EarthBOUND®**  
FLOC TABS PASSIVE TREATMENT – TURBIDITY CONTROL

**EarthBOUND®**  
FLOC ROLLS PASSIVE TREATMENT – TURBIDITY CONTROL

**FUSION™**  
EROSION CONTROL &  
BIOTIC SOIL AMENDMENT

**ORGANIX™**  
BIOTIC SOIL AMENDMENT

**DUST** **COV-R**

**Posi-Lock™**  
CONTAINMENT SYSTEM



ENVIRONMENTAL  
PRODUCTS, LLC™

Thank you!

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