FIVE FUNDAMENTALS FOR SUCCESSFUL LAND REHABILITATION

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Oklahoma City, Oklahoma
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Profile Products LLC

Presentation Overview

- The Five Fundamentals
- Integration via PS^3 Software Program
- Successful Mining/Energy Case Histories
- Questions and Answers

Fundamental #1
Understand Your Substrate

- Texture/Type – sand, silt, or clay?
- pH – to determine soil acidity or alkalinity
- % Organic Matter and % Organic Acids
- Nitrogen, Phosphorus & Potassium (N, P, K)
- Electrical Conductivity (EC)
- Total Dissolved Salts (TDS)
- Cation Exchange Capacity (CEC)
- Sodium Adsorption Ratio (SAR)
- Excess metals and salts

Profile Soil Solutions Software

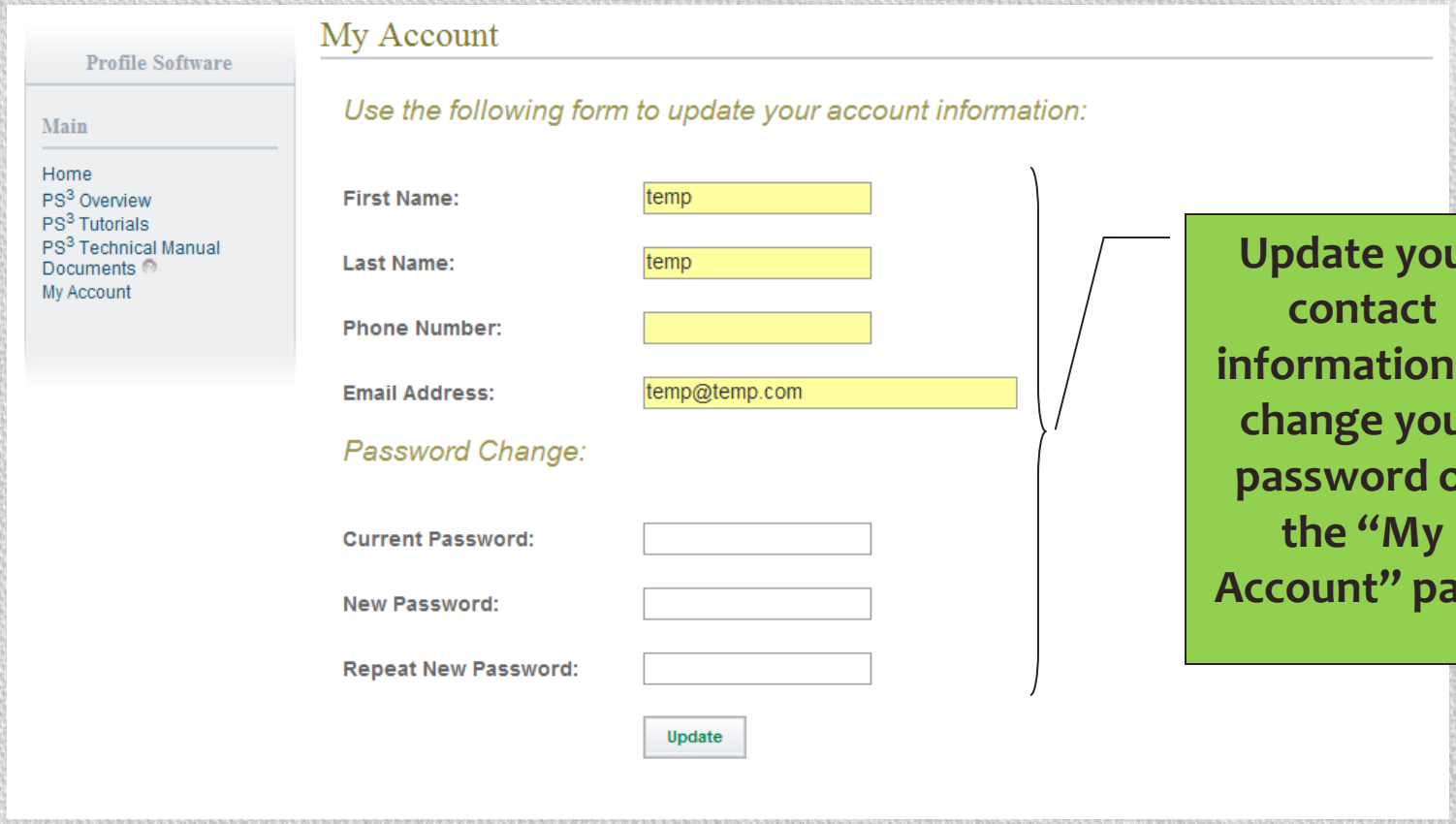
PS3

PROFILE SOIL SOLUTIONS
SOFTWARE

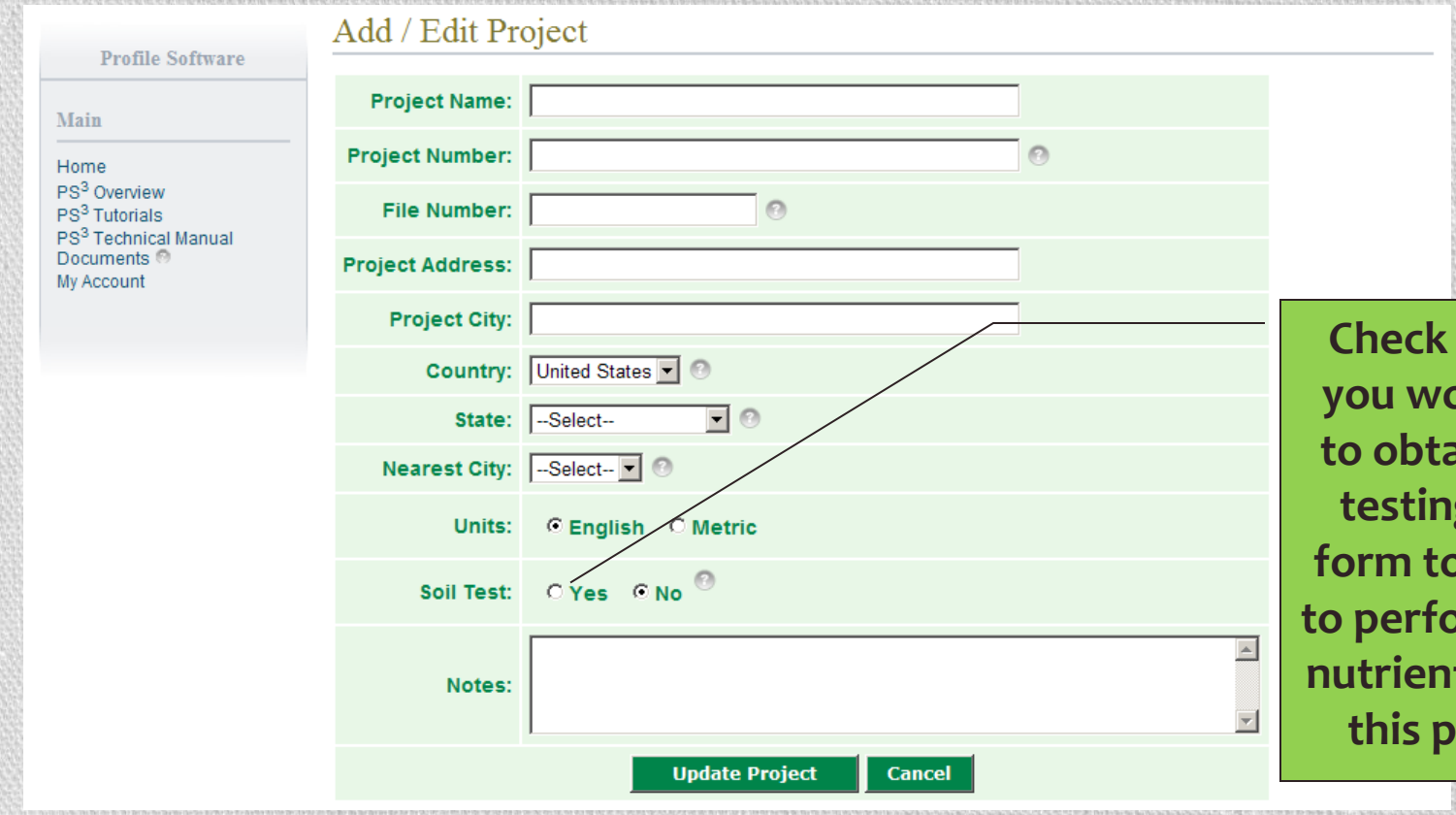
www.profileps3.com

"In the Ground, On the Ground and By Your Side"

Navigation – My Account



Project Basics – Add/Edit Project



Check "yes" if you would like to obtain a soil testing input form to be able to perform a soil nutrient test for this project.

Profile
Your Trusted Partner In Soil Solutions

Profile Soil Analysis Laboratory
300 Speedway Circle, Suite 2
Lincoln, NE 68502
800-508-8681

Master Account No. 2861310
Report Type: Soil Test Input
Report No. 0111-0006-1

Project Name:	Jakarta Mine Project
Project City:	Jakarta
Project State:	Java, Indonesia

Date Samples Shipped:	

Sample No.	Sample Description	Location of Sample	Lab Use Only
1			
2			
3			

Instructions / Guidance

Proper Sampling Equipment:
Equipment should be such, that sampling depth can be monitored and controlled. A stainless steel sampling probe works the best, but is not required. Composite samples should be collected in a plastic bucket for thorough mixing. Metal buckets can contain traces of some micro-nutrients (particularly zinc), which can contaminate samples. Soil sample bags should be either plastic or plastic lined.

Sampling Procedures:
Determine which areas are to be sampled. Review the site, note significant changes in soil, such as color or texture. Each sample should consist of a composite of many sub-samples from like soils. Try to composite 10 to 15 sub-samples to create one representative sample. The volume of soil needed is roughly one 8 ounce cup (or approximately one pound). It is most important to "keep the sampling depth consistent". Erosion Control projects should be sampled to a depth of 3 inches. If organic matter is on the surface, scrape away prior to sampling, usually no more than ¼" to ½" surface layer. Insert each composite sample into a Ziploc bag and clearly mark the sample identification number (should be 01, 02 or 03) on each bag along with the matching input form report number using a permanent marker. Then place this bag inside another Ziploc bag and label the second bag identical to the first.

Paperwork and Shipping Instructions:
Please be sure all information is completed on the soil testing input form. Be sure to make a copy of the input form for your records. Prior to closing up the box, make sure that the soil sample bags are properly labeled, double bagged and correspond with the input sheet. Pack samples very tightly in a strong shipping box. Use packing material so the bag(s) will not shift in the box. Tape the box completely and affix a shipping label. If possible, collect and ship samples the same day.

For more than 3 samples on a project call Profile using the number provided above.
Sample Description Example: loamy sand soil with organic matter
Location of Sample Example: south facing 2H:1V slope above pond
Make a copy of the form for your records and then ship this form and samples to address shown on top of the form.
Do not use this form more than once as each form has a tracking number!

Testing Packages:	Diagnostic + Soluble Nutrients + Particle Size Analysis

Soils Report Screen Shot

Soil Test Results

* All soil tests were conducted by an independent, third-party laboratory.

Project:	0111-0012
* **Project Name:**	Nickel Mine
Project Number:	2
File #:	
Location:	New Caledonia
Notes:	

Soil Sample Locations and Descriptions

Sample (#)	Location	Description
1	OMESDOM 3	COMPOSITE SOIL FOR SLOPE

Soil Analysis Results

Sample (#)	Texture (USDA)	Sand (%)	Silt (%)	Clay (%)	Soil pH (6.3 - 7.3)	TDS[1] (ppm) (< 256)	SAR[2] (< 2)	Organic Matter (%) (3 - 5%)	CEC % Sodium[4] (%) (< 2%)
1	Sandy Loam	64	18	18	8.2	256	0.2	3	0.6
(Optimum Plant Growth Conditions)									

Sample (#)	NO_3 (lb/acre)[5]	PO_4 (lb/acre)[5]	K (lb/acre)[5]	Ca (lb/acre)[5]	Mg (lb/acre)[5]	Zn (lb/acre)[5]	Mn (lb/acre)[5]	Cu (lb/acre)[5]	Fe (lb/acre)[5]	B (lb/acre)[5]	SO_4 (lb/acre)[5]
1	11.2	0.2	4.69	152	86.53	0.2	4	0.6	143.4	0.4	15.36

Notes: 1. Total Dissolved Salts, 2. Sodium Absorption Ratio, 3. NeutraLime is also available in a liquid form, please contact a Profile representative with questions. 4. Sodium as % Base Saturation Cation Exchange Capacity (CEC), 5. lb/acre associated with a 6-inch depth.

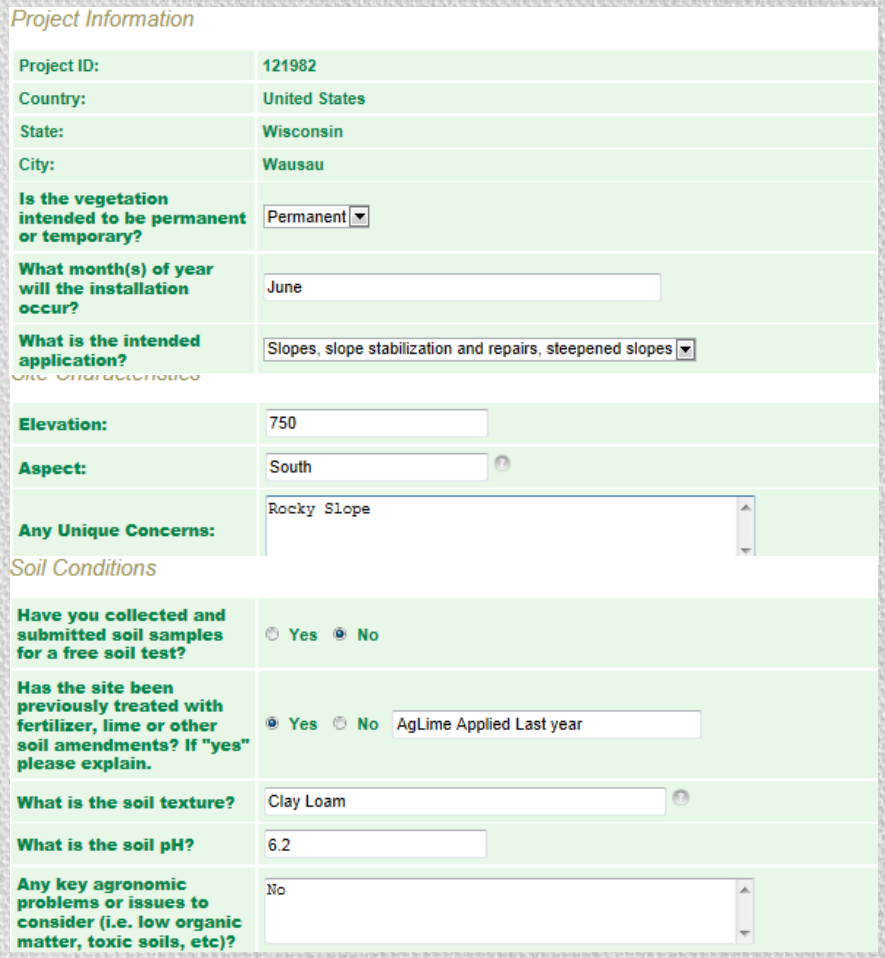
Agronomic Amendments

- Fertilizers
  - Quick release synthetic formulations
  - Slower release organic/natural formulations
- Soil Neutralizers
  - Raise or lower substrate pH
  - Lime, sulfur or acidifiers
- Organic Matter
  - Compost/manure/natural fibers
  - Biotic Soil Amendments
- Growth Stimulators & Enhancers
  - Achieve faster germination & establishment
  - Sustain long-term plant vitality
  - Typical ingredients include:
    - Humic and fulvic acids
    - Porous ceramics
    - Biochar
    - Bacterial or microbial cultures
    - Endo -Mycorrhizae
    - Seaweed extracts/cytokinins

#2 – Species Selection

- Where is project?
- Soil characteristics?
- Permanent or temporary vegetation?
- When will the installation occur - seasonality?
- Desired plant materials
  - Native, introduced, drought tolerant, palatable, warm or cool season, legumes, wildflowers, shrubs, trees, etc.
- What is the intended application?
  - Slope, channel, riverine, shoreline, levee, cover system, etc.
- Site characteristics – such as elevation, topography, aspect, climatic conditions
- Maintenance activities – irrigation, mowing, supplemental amendments or grazing?

Species Selection Screen Shots



Project Information

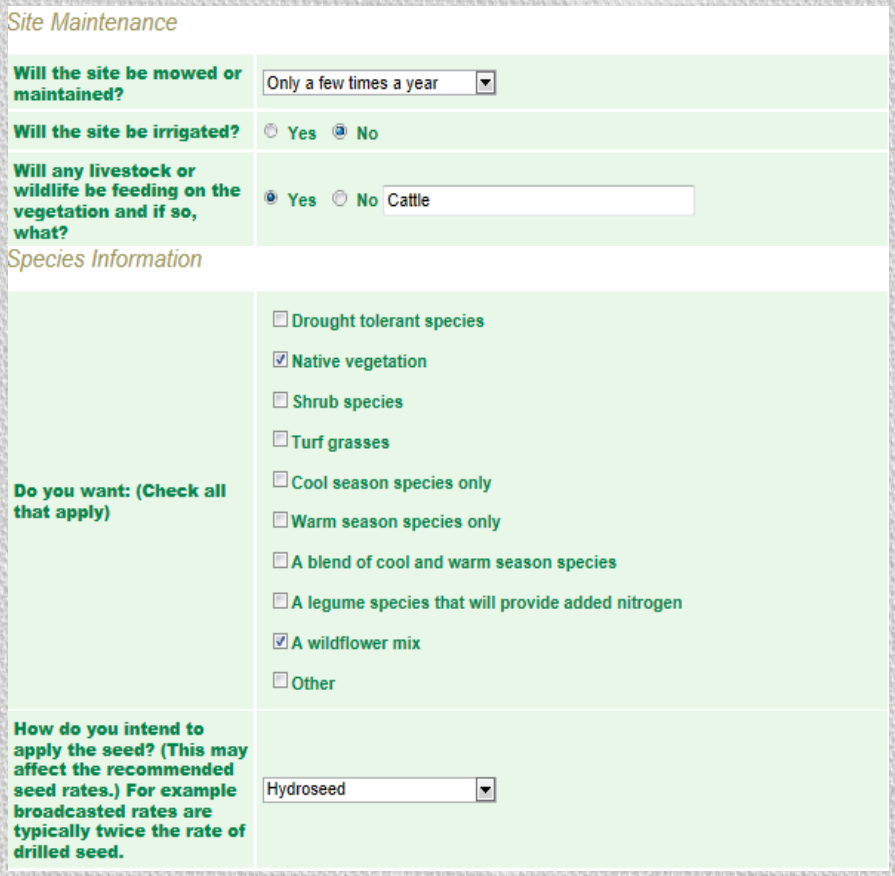
Project ID:	121982
Country:	United States
State:	Wisconsin
City:	Wausau
Is the vegetation intended to be permanent or temporary?	Permanent
What month(s) of year will the installation occur?	June
What is the intended application?	Slopes, slope stabilization and repairs, steepened slopes

Site Characteristics

Elevation:	750
Aspect:	South
Any Unique Concerns:	Rocky Slope

Soil Conditions

Have you collected and submitted soil samples for a free soil test?	○ Yes ◉ No
Has the site been previously treated with fertilizer, lime or other soil amendments? If "yes" please explain.	◉ Yes ○ No AgLime Applied Last year
What is the soil texture?	Clay Loam
What is the soil pH?	6.2
Any key agronomic problems or issues to consider (i.e. low organic matter, toxic soils, etc)?	No



Site Maintenance

Will the site be mowed or maintained?	Only a few times a year
Will the site be irrigated?	○ Yes ◉ No
Will any livestock or wildlife be feeding on the vegetation and if so, what?	◉ Yes ○ No Cattle

Species Information

Do you want: (Check all that apply)	☐ Drought tolerant species ☑ Native vegetation ☐ Shrub species ☐ Turf grasses ☐ Cool season species only ☐ Warm season species only ☐ A blend of cool and warm season species ☐ A legume species that will provide added nitrogen ☑ A wildflower mix ☐ Other
How do you intend to apply the seed? (This may affect the recommended seed rates.) For example broadcasted rates are typically twice the rate of drilled seed.	Hydroseed

#3 – Erosion Control Practices

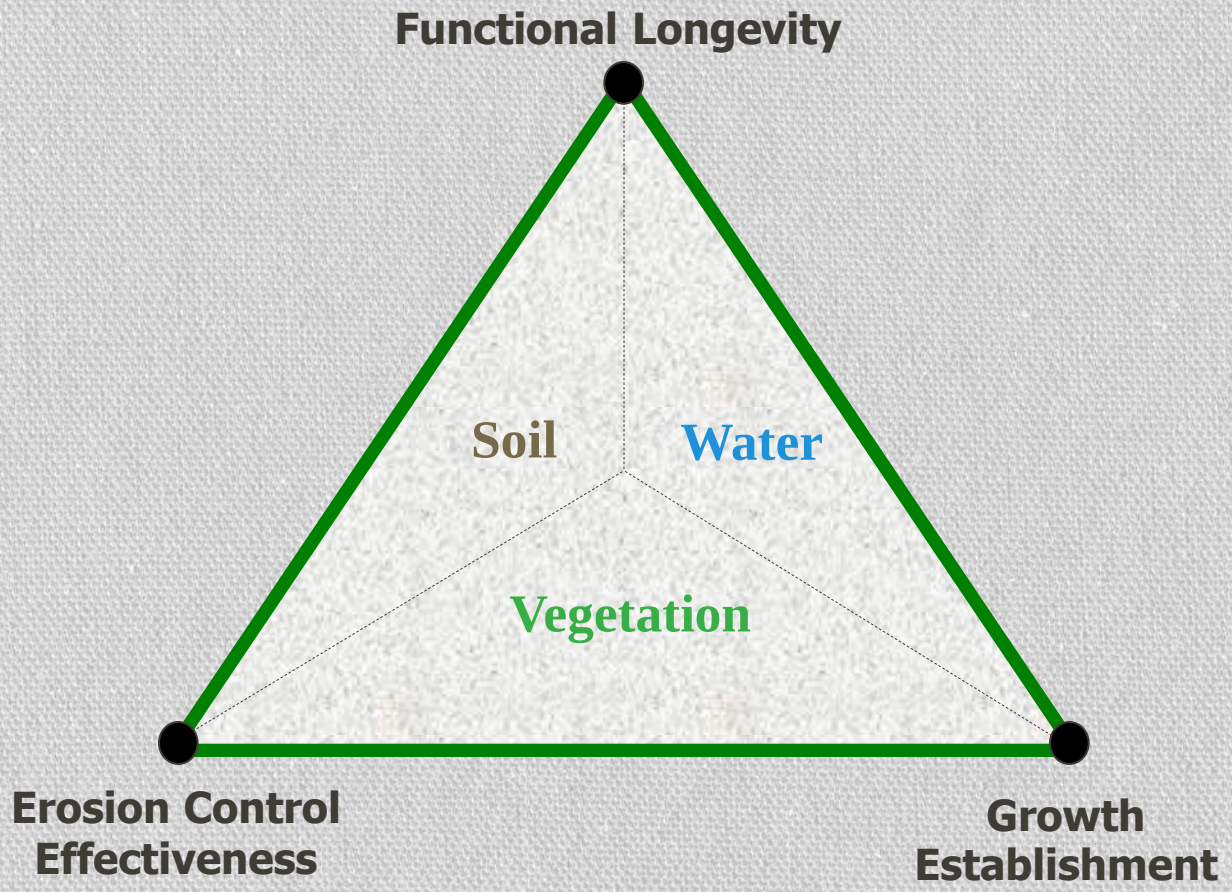
Establishing vegetation requires balancing

NATURAL VARIABLES

and

PRODUCT BENEFITS

to create the best environment for growth and establishment



"The Green Engineering Triangle"

Erosion Control Selection – Slopes

Universal Soil Loss Equation (MUSLE and RUSLE)

A = R x K x LS x C x P

Where:

A = computed soil loss/unit area/unit time for *a given storm period* and intensity

R = rainfall factor

K = soil erodibility factor

L = slope length factor

S = steepness factor

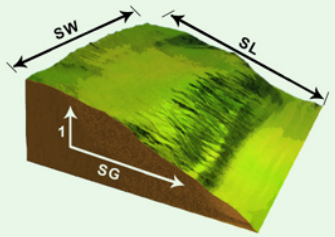
C = vegetation or cover factor

P = erosion control practice factor

C-Factor calculated as soil loss ratio of treated surface versus an untreated control surface … 5 kg/100 kg = 0.05

Project Basics - Slopes

Add / Edit Slope



Slope Name:	
Functional Longevity:	< 3 months
Supporting Practices Factor (P):	Loose - Disked Plow Layer (1.0)
Soil Density (Y):	92 lb/ft^3
Thawing Soils?	○ Yes ◉ No
Soil Loss Limit (SLL):	0.01 in
Slope Length (SL):	ft
Slope Gradient (SG):	H:1 V
Slope Width (SW):	ft
Soil Type:	Clay
Expected Final Cover Type:	No Vegetation Expected
Rainfall Factor (R):	30.6
Required Growth Establishment Factor (G):	Standard
Tank Size:	1000 gal

Save and Calculate | Cancel

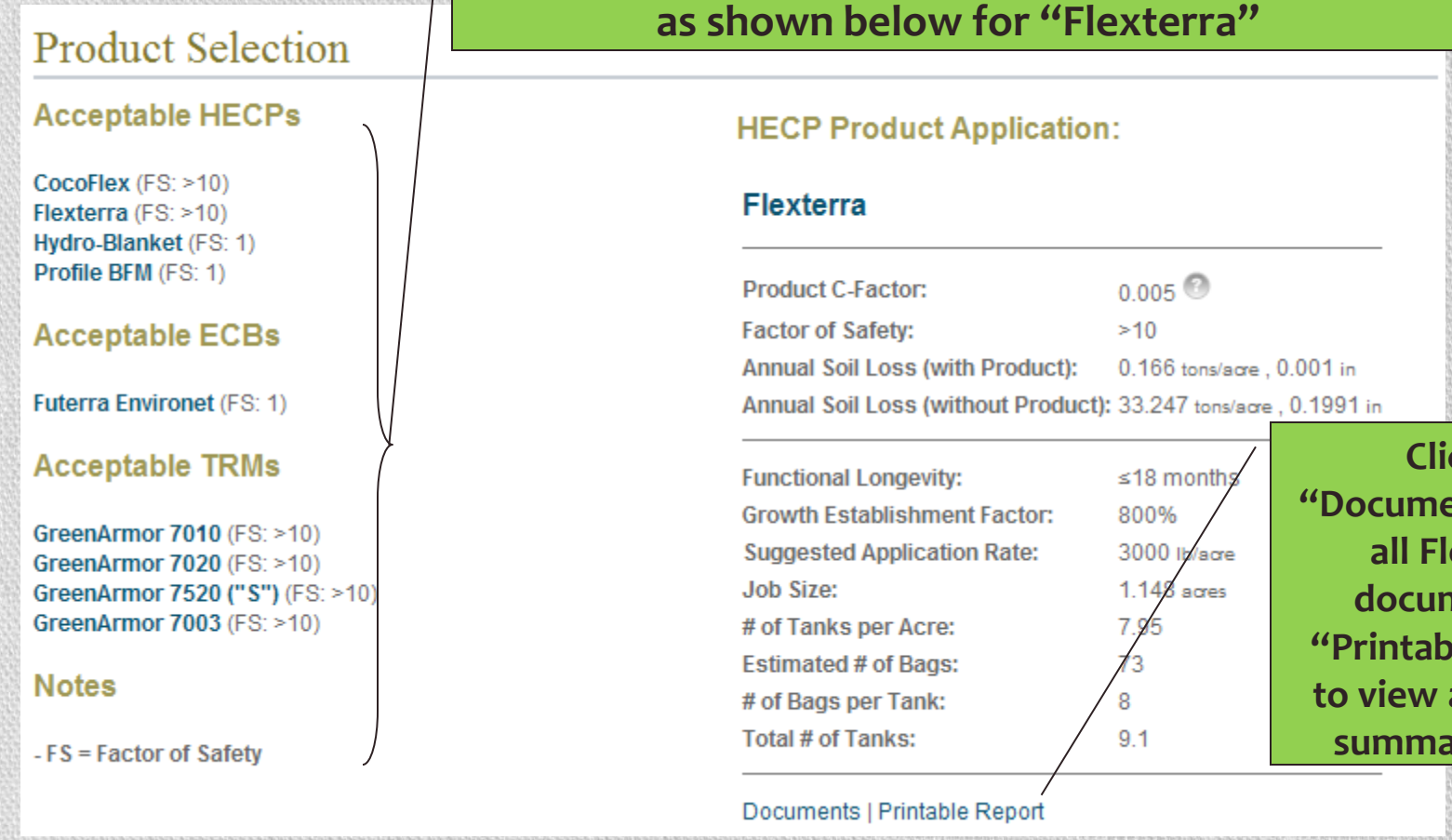
Input the necessary information to determine the most appropriate Profile Products for your slope project.

Click Save and Calculate

As a reminder, click on any of the "?" to get more information.

Project Basics - Slopes

Click on any of the products to view more details as shown below for "Flexterra"



Click on "Documents" to see all Flexterra documents or "Printable Report" to view a printable summary report

Design Considerations – Channel Applications

Manning's Equation for Permissible Velocity

$$V = \frac{C}{n} R^{2/3} S_f^{1/2}$$

V = average velocity (ft/s, m/s)

C = 1.49 for U.S. Customary Units ; = 1 for SI Units

n = manning's roughness coefficient (dimensionless)

R = hydraulic radius (ft, m)

= cross sectional area divided by wetted perimeter (A/P)

S_f = friction slope of channel (can be approximated as average bed slope for uniform flow conditions) (ft/ft, m/m)

US FHWA Hydraulic Engineering Circular #15 –
Design of Roadside Channels with Flexible Channel Liners

Design Considerations – Channel Applications

Permissible Shear Stress Equation

$$\tau = \gamma d S_o$$

τ = shear stress (lb/ft^2, Pa)

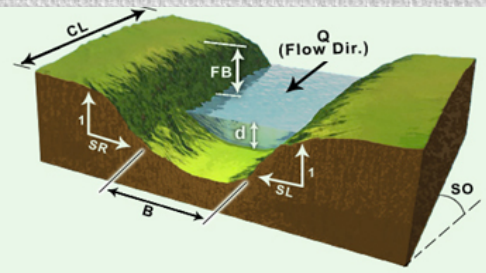
γ = unit weight of water (62.4 lb/ft^3, 9.80 KN/m^3)

d = maximum flow depth (ft, m)

S_o = average bed slope (ft/ft, m/m)

US FHWA Hydraulic Engineering Circular #15 –
Design of Roadside Channels with Flexible Channel Liners

Project Basics - Channels



Channel Name:	
Channel Shape:	Trapezoidal
Functional Longevity:	< 3 months
Existing Soil Description:	Silty Sands
Flow:	Rate (Q) ft³/s
Bottom Width (B):	ft
Right Side Slope (SR):	H:1V
Left Side Slope (SL):	H:1V
Longitudinal Channel Slope (SO):	ft/ft
Retardance Class:	C
Grass Growth Form:	Sod
Cover Density:	Very Good (80-90%)
Channel Length (CL):	ft
Required Freeboard (FB):	ft
Has Channel Bend?	Yes No

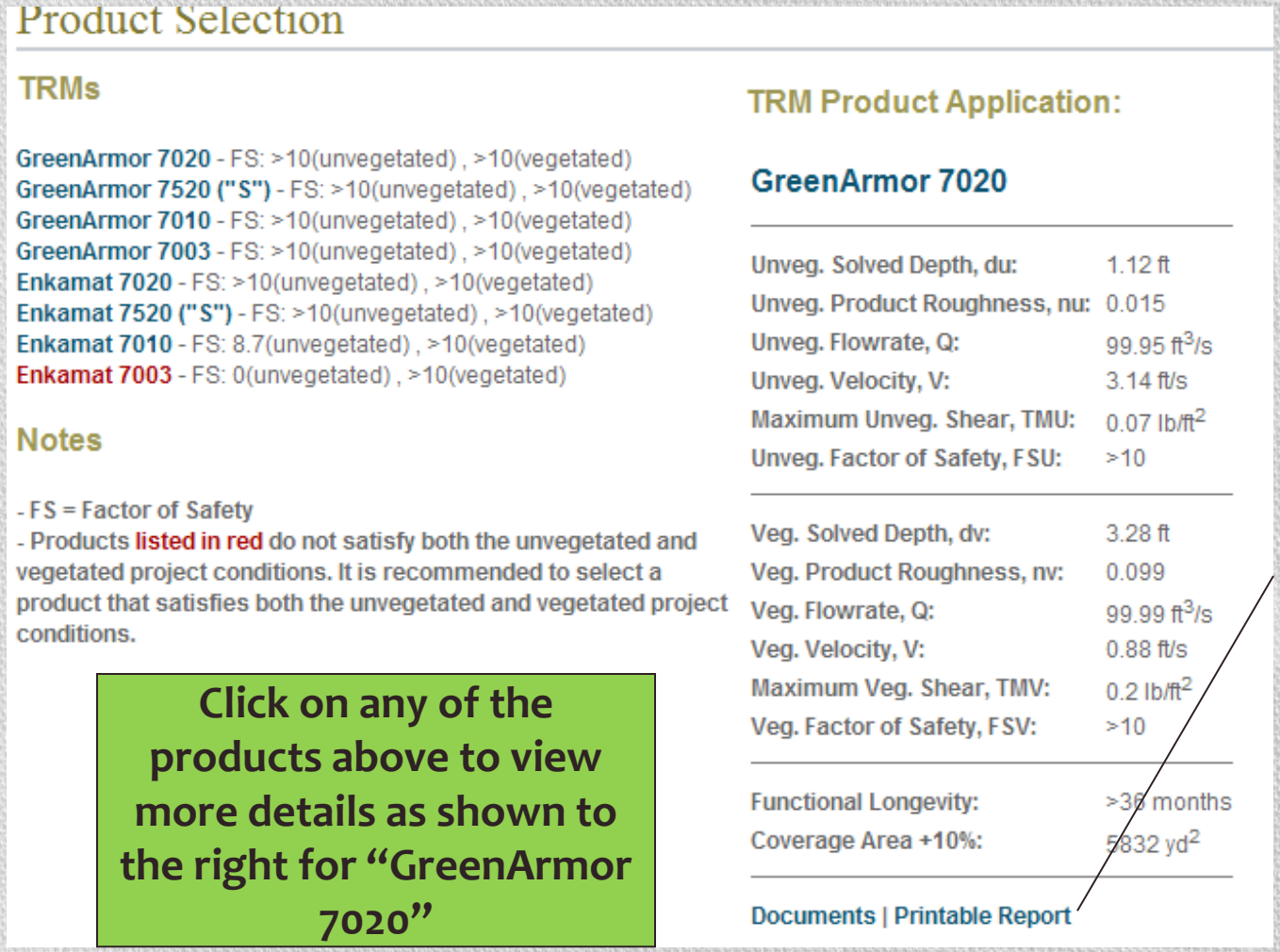
Save and Calculate | Cancel

Input the necessary information to determine the most appropriate Profile Products for your channel project.

Click Save and Calculate

As a reminder, click on any of the "?" to get more information.

Project Basics - Channels



Click on any of the products above to view more details as shown to the right for "GreenArmor 7020"

Click on "Documents" to see all GreenArmor 7020 documents or "Printable Report" to view a printable summary report

#4- Proper Installation

- Comprehensive and detailed construction specifications with plans/drawings
- Complete installation guidelines
- Tools or calculators to facilitate mixing ratios and/or application rates
- Experience…
- Site Specific Experience!

Mixing and Application Guidelines

Application Guide for Profile® HP-FGM™ and ET-FGM™

Application / Loading Procedures

A. Strictly comply with equipment Manufacturer's installation instructions and recommendations. Use approved hydro-spraying machines with fan-type nozzle (50-degree tip) whenever possible to achieve best soil coverage. Apply from opposing directions to assure 100% soil surface coverage. Slope interruption devices or water diversion techniques are recommended according to the slope interruption limits table on the back.

B. To ensure proper application rates, measure and stake area. For maximum performance, apply in a two-step process*:

1. Apply specified prescriptive agronomic formulations along with 50% of seed with a small amount of HP-FGM™ or ET-FGM™ for visual metering.
2. Mix balance of seed and apply HP-FGM or ET-FGM at a rate of 50 pounds per 125 gallons (see mixing section on the back for details) of water over freshly seeded surfaces. See loading chart on the back and confirm loading rates with equipment manufacturer. Do not leave seeded surfaces unprotected, especially if precipitation is imminent.

C. Fill 1/3 of mechanically agitated hydroseeder with water. Turn pump on for 15 seconds and purge and pre-wet lines. Turn pump off.

D. Turn agitator on and load low density materials first (i.e. seed).**

E. Continue slowly filling tank with water while loading fiber matrix into tank.

F. Consult loading chart on the back to determine the number of bags to be added for desired area and application rate.

G. HP-FGM or ET-FGM should be completely loaded before water level reaches 75% of the top of tank.

H. Top off with water and mix until all fiber is fully broken apart and hydrated (minimum of 10 minutes — increase mixing time when applying in cold conditions). This is very important to fully activate the bonding additives and to obtain proper viscosity.

I. Add fertilizer.

J. Shut off recirculation valve to minimize potential for air entrainment within the slurry.

K. Slow down agitator and start applying with a 50-degree fan tip nozzle.

L. Spray in opposing directions for maximum soil coverage.

Depending on site conditions, HP-FGM or ET-FGM may be applied in a one-step process where all components may be mixed together in single tank loads. Consult with Manufacturer for further details.

***Do not add tackifiers or polymers.*

Loading Chart for Profile's HP-FGM and ET-FGM

Tank Size (gal)	# of 50-lb bales	(lb)	Displacement (gal)	2,500 lb/acre		3,000 lb/acre		3,500 lb/acre		4,000 lb/acre		4,500 lb/acre	
				Sq ft	Acres	Sq ft	Acres	Sq ft	Acres	Sq ft	Acres	Sq ft	Acres
250	2	100	280	1,742	0.040	1,452	0.033	1,245	0.029	1,089	0.025	968	0.022
500	4	200	560	3,485	0.080	2,904	0.067	2,489	0.057	2,178	0.050	1,936	0.044
750	6	300	840	5,227	0.120	4,356	0.100	3,734	0.086	3,267	0.075	2,904	0.067
1,000	8	400	1,120	6,970	0.160	5,808	0.133	4,978	0.114	4,356	0.100	3,872	0.089
1,500	12	600	1,680	10,454	0.240	8,712	0.200	7,467	0.171	6,534	0.150	5,808	0.133
2,000	16	800	2,240	13,939	0.320	11,616	0.267	9,957	0.229	8,712	0.200	7,744	0.178
2,500	20	1,000	2,800	17,424	0.400	14,520	0.333	12,446	0.286	10,890	0.250	9,680	0.222
3,000	24	1,200	3,360	20,909	0.480	17,424	0.400	14,935	0.343	13,068	0.300	11,616	0.267
3,500	28	1,400	3,920	24,394	0.560	20,328	0.467	17,424	0.400	15,246	0.350	13,552	0.311
4,000	32	1,600	4,480	27,878	0.640	23,232	0.533	19,913	0.457	17,424	0.400	15,488	0.356

Additional Notes:

- For hose applications, 35 lb/100 gal is recommended.
- Rough surfaces (rocky terrain, cat tracks, ripped soils, etc.) may require additional product to achieve 100% coverage.
- Be sure to allow for residual material in tank on subsequent applications.

Application Rates

Slope Condition	English	SI
≤ 4H to 1V	2500 lb/acre	2800 kg/hectare
> 4H to 1V and ≤ 3H to 1V	3000 lb/acre	3400 kg/hectare
> 3H to 1V and ≤ 2H to 1V	3500 lb/acre	3900 kg/hectare
> 2H to 1V and ≤ 1H to 1V	4000 lb/acre	4500 kg/hectare
> 1H to 1V[1]	4500 lb/acre	5100 kg/hectare
Below ECB or TRM	1500 lb/acre	1700 kg/hectare
As infill for TRM[2]	3500 lb/acre	3900 kg/hectare

[1]HP-FGM or ET-FGM recommended for slopes greater than 1H:1V.
[2]Use only approved and tested TRMs to create the GreenArmor System.

Slope Interruption Limits*

Product Category	Length (ft)	Length (m)
HP-FGM	100	30
ET-FGM	125	38

*Listed slope interruption limits are for product applications on a 3H:1V slope. For application on steeper slopes, slope interruption lengths may need to be decreased.

Application Calculator

Project and Conversion Information

Calculation Name:	Low pH area	
Select A Project:	Matt's Example Project	
Desired Units:	U.S.	
Project Area:	37,000	Square Meter:
Working Capacity Hydroseeder Size:	3000	Gallons
Hydroseeding Product:	Flexterra	
Mulch Application Rate:	3500	lb/ac
Mulch Cost Per Unit (USD):	45.00	

Liquid Amendment

Product:	JumpStart	
Application Rate:	10	gal/ac
Cost Per Unit (USD):	180.00	

* DO NOT MIX AQUA-PHIX AND JUMPSTART IN THE SAME HYDROSEEDING MIXTURE. USE A TWO-STEP PROCESS.

Dry Amendments

Product	Application Rate		Cost Per Unit (USD)	Action
BioPrime	40	lb/ac	80	Delete
NeutraLime Dry	160	lb/ac	20.00	Delete

Add New

Fertilizers / Seed / Other

Product	Application Rate		Action
SlopeMaster Seed Mix	7	lb/1000 sq ft	Delete

Add New

Project Information

Project Size:	9.14 398,260.37	Acres Square Feet
Working Capacity Hydroseeder Size:	3,000.00	Gallons
Mulch Application Rate:	3500	lb/ac
Total Hydroseeder Tanks:	26.67	
Total Project Cost (USD):	$36,845.74	

Mulch

Product Name	Total Amount Required		Total Units Required		Product / Tank Load		Cost Per Unit (USD)	Total Cost (USD)
Flexterra	32,000.02	Pounds	640.00	Bags	24.00	Bags	$45.00	$28,800.02

Liquid Amendment

Product Name	Total Amount Required		Total Units Required		Product / Tank Load		Cost Per Unit (USD)	Total Cost (USD)
JumpStart	91.43	Gallons	36.57	Bottles	3.43	Gallons	$180.00	$6,582.86

* DO NOT MIX AQUA-PHIX AND JUMPSTART IN THE SAME HYDROSEEDING MIXTURE. USE A TWO-STEP PROCESS.

Dry Amendments

Product Name	Total Amount Required		Total Units Required		Product / Tank Load		Cost Per Unit (USD)	Total Cost (USD)
BioPrime	365.71	Pounds	9.14	Bags	13.71	Pounds	$80.00	$731.43
NeutraLime Dry	1,462.86	Pounds	36.57	Bags	54.86	Pounds	$20.00	$731.43

Fertilizers / Seed / Other

Product Name	Total Amount Required		Product / Tank Load	
SlopeMaster Seed Mix	2,787.84	Pounds	104.54	Pounds

#5 – Inspection and Maintenance

- Inspection by qualified professionals whose expectations are consistent with installer as well as owner and regulatory entity(s)
- Initial inspections to insure installations are in accordance with plans/specs with material quantities and activities fully documented
- Subsequent inspections conducted at pre-determined time intervals and maintenance activities conducted after each significant precipitation or other potentially damaging weather event

Is Everyone on the Same Page?

General Installation for Slopes and Channels Used for Futerra 7003, 7010, 7020 and R45 Series

These suggestions represent generally accepted procedures for successful installation of Futerra Turf Reinforcement Mats (TRMs). These instructions may be followed, modified, or rejected by the owner, engineer, contractor or their representative since they, not Profile are responsible for planning and executing procedures appropriate to a specific application.

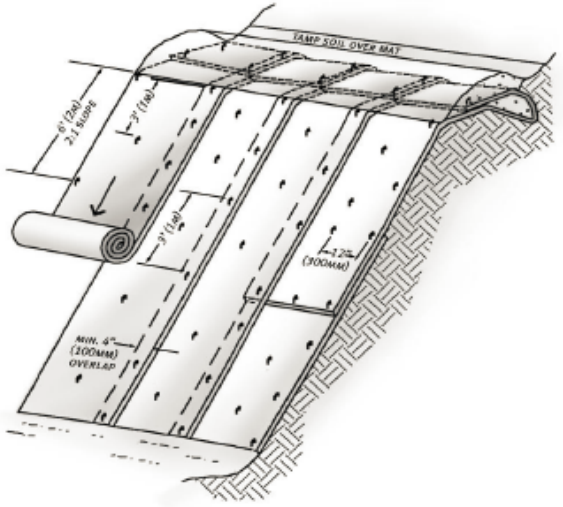
Futerra TRM is packaged in rolls that are easy to ship, store and install. No heavy equipment is needed for installation of matting: a roll can be handled by one or two workers.

1. **Site Preparation:** Whether slope or channel, the site must be shaped to the design specifications (grade geometry, density of soil, etc.) and then dressed to be free of soil clods, clumps, rocks, or vehicle imprints of any significant size that would prevent the Futerra TRM from lying flush to surface contours.

2. **Anchor Trench:** Anchor trenches are required to securely fasten the Futerra TRM to the ground surface. In channel applications, the initial anchor trench is installed at the beginning of the channel and intermediate check slots are spaced at approximately 7.6 m* intervals downstream depending on flow conditions and whether you soil fill or not. Futerra TRM is installed into the bottom of the trench and fastened with pins spaced 0.9 meters apart. The anchor trench / intermediate check slots are then backfilled and compacted in a manner as to not damage the Futerra TRM.

   * In lieu of excavated check slots, a double row of pins [or a number 1 or 2 rebar pinned across the mat] may be used at 7.6-m intervals.

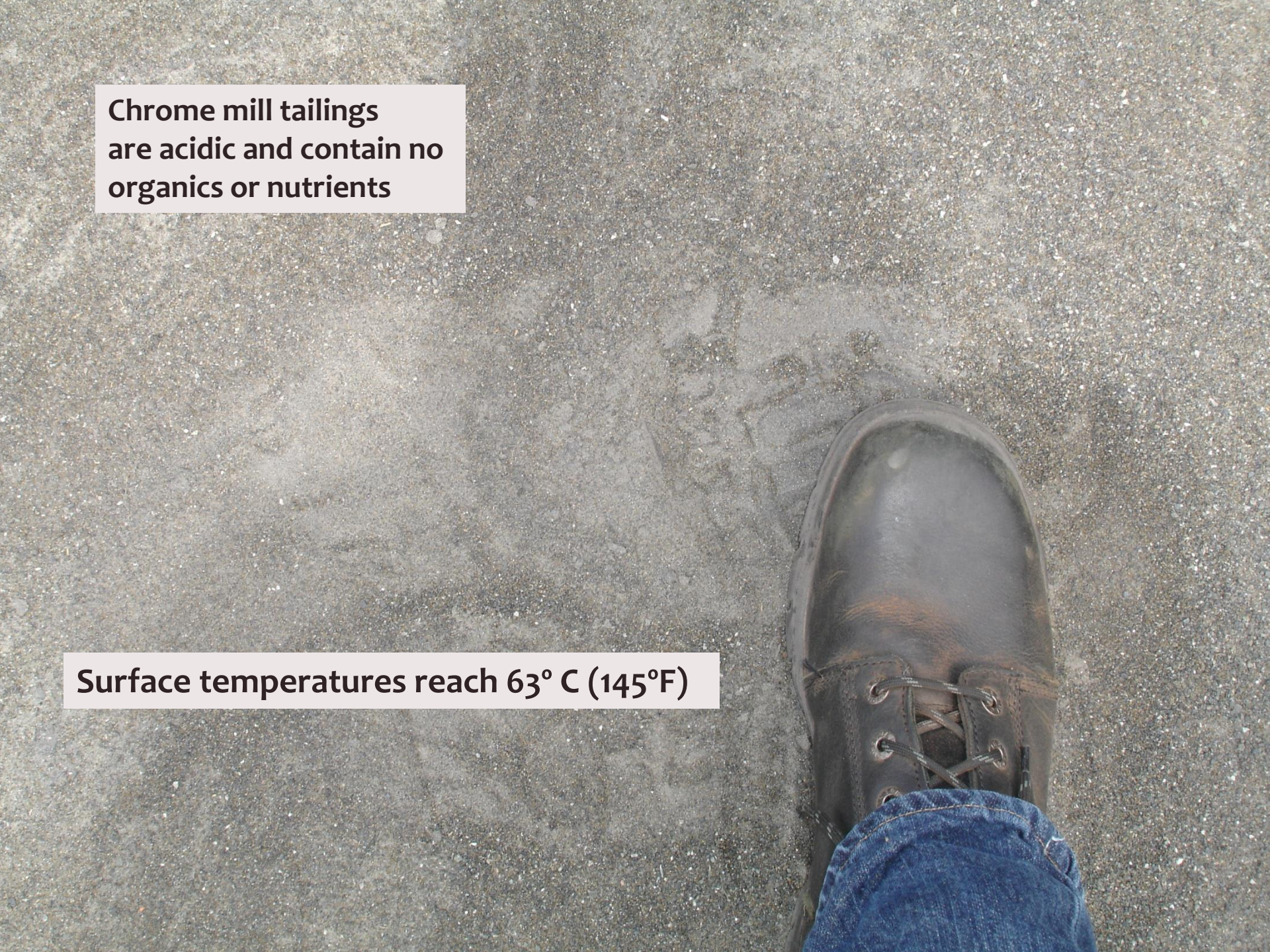
3. **Futerra TRM Installation:** Roll TRM down the slope or channel. The overlap between rolls is a minimum of 100mm. The splice between roll ends is a minimum of 60 cm. Shingle the roll in the direction of water flow. Install pins down the center of each 2.44 meter wide mat staggering them between the outside pins with a spacing interval of 0.9 to 1.5 meters. Pins patterns will vary depending upon application, soil type, slope or channel slope, geometry, etc. A rule of thumb for estimating the amount of pins required for a project is:



1H:1V to 2H:1V slopes
4-5 pins per m²

≤3H:1V slopes
3-4 pins per m²


Chrome Mine
Rustenburg/Krondaal Area, South Africa
January 2012


Chrome mill tailings
are acidic and contain no
organics or nutrients
Surface temperatures reach 63° C (145°F)

The Integrated Approach

- Prescriptive biological soil treatment hydraulically-applied at 8,000 kg/ha (7,142 lb/ac)
  - Organic matter – composted manure
  - Humic and fulvic acid
  - Microbial cultures
  - Slow release soft rock phosphate
- Lime applied at 2,240 kg/ha (2,000 lb/ac)
- Slope roughening to slow surface runoff, increase infiltration, and create pockets for germination and growth

The Integrated Approach

Transvaal Highveld Mixture
Prescriptive seed mix – "The Big Five"

- *Eragrostis tef* – "Teff "
- *Eragrostis curvula* – Weeping lovegrass/Oulandsgras
- *Digitaria eriantha* – Smutsfinger grass/Common Finger Grass
- *Chloris gayana* – Rhodes grass
- *Cynodon dactylon* – Bermuda or kweek grass

and

- Anthephora pubescens – wool grass
- Cencus cilliaris – blue buffel grass/bloubuffelgras

Erosion Control Material

- Flexible Growth Medium
  - To resist heavy downpours
  - Facilitate growth establishment
  - Long dry season – functional longevity > 1 year
- Hydraulically-applied at 3,600 kg/ha (3,214 lb/ac) on 2H:1V slopes, 8 -10 meters high
- Two-step application
  - Step one – amendments, seed mix and tracer
  - Step two – flexible growth medium from two directions


January 2012
3 weeks growth


June 2012
6 months later

February 2013
14 months later


Nickel Mill Slag
Remediation Project
Sudbury, Ontario, Canada

The Integrated Approach – Soil Test

- Slag – highly acidic, low in organic matter and nutrients
- 46 cm (18 in) clay cover specified
- 61,164 m^3 (80,000 yd^3) of clay
- Lime, synthetic fertilizer and biostimulants applied directly on clay cover

The Integrated Approach – Seed Mix

- Grasses – perennial ryegrass, Canada bluegrass, timothy, red top, hard fescue, creeping red fescue, meadow fescue, chewings fescue
- Legumes – alsike clover, red clover, white clover, birdsfoot trefoil
- Applied at 252 kg/ha (225 lb/ac)

Erosion Control Material

- Flexible Growth Medium
- Hydraulically-applied at 5,100 kg/ha (4,500 lb/ac) on 3H:1V slopes, 30 meters long
- Late fall dormant seeding
- Cat tracked (dozer walked) slopes
- Fiber filtration tubes for slope interruption
- Two-step application
  - Step one – amendments, seed mix and tracer
  - Step two – flexible growth medium from two directions


Sudbury, Ontario
October 2006


June 2008


March 2009
Power Generation Site
Flexterra® HP-FGM, 20-20-20 fertilizer &
agronomic formulations including
NeutraLime ™, JumpStart ™ and
BioPrime™


Coal Ash with 15 cm (6 in) Soil Cover
Slopemaster™ Seed Mix
K 31 Tall Fescue
Red Top
Hulled Bermuda
Weeping Love Grass
Durana White Clover
Red Clover
Millet


July 2009
4 months later


July 2010
16 months later – Sustainable Vegetation!

In Conclusion

- Five Fundamentals
  - **Test the soil or substrate** to understand your "foundation"
  - **Pick plant materials** compatible with project goals
  - **Select cost effective erosion control measures**
  - **Insure proper installation**
  - **Coordinate Inspections & Maintenance** to insure success
- Fundamentals must be integrated into a working process that entails proper planning and execution


Questions?

High Elevation Site

High Elevation Site

High Elevation Site