



EnviroStraw & EnviroMatrix Case Study (BHP Billiton) South Walker Creek Mine Site Rehabilitation

- Prepared by: Hercules Strydom, Agronomist (Specialising in Biological Farming Enterprises)
 - Date: October-December 2015
 - Project: 50-hectare rehabilitation program on the South Walker Creek mine site.
 - Background: During this period the site received no significant rain events, with the exception of one 5 – 10 mm rain event on the southern section of the project. From that single rain event, some seed germination was experienced and some water pooling occurred from overland flow (which was sufficient to moisten the soil). Average daily temperatures were 35 to 40 degrees C.
- * Please see separately attached typical soil analysis report of the different areas that needed rehabilitation.

The soil analysis report showed soils with unbalanced nutrients, low organic carbon and very high sodium levels. The applied top soils were highly dispersive, slaking & hydrophobic, with signs of very poor moisture penetration.

The EnviroStraw GrowSafe mineral fertiliser system and principals were applied as part of the rehabilitation program. A mineral based fertiliser, inoculated with 30 different microbial species was used as part of the program, with a specially formulated hydromulch medium on the steeply sloped areas. The flat areas were treated with a direct seeded application method which included a biologically activated mineral fertiliser and specified seed mix.

On the sloping areas, the soil surface was roughed up by deep ripping, to create a proper seedbed and to help with moisture penetration.

The EnviroMatrix Hydraulic Growth Medium (HGM) was developed with the aim to apply all required mediums to the soil. When sufficient rain occurs, it then activates seed germination and plant establishment. The first step in the

rehabilitation program is when the new growth reaches maturity and produces seeds.

Some germination was observed in pooled areas with less than a 10mm rain event.

Soil surface temperature measurement comparisons: treated versus untreated

The mine site environmental officers were surprised by the successful germination and growth after the initial major rain event. They commented that it is one of the best results they have witnessed when compared to other projects on this site.

Nearly all plants that germinated went to seed without yellowing or premature seed setting, in comparison to all other previous revegetation projects.

The EnviroStraw GrowSafe revegetation concept is driven by a better understanding of how the ecological system works. In a natural ecological recovery mechanism system, pioneer plant species (with the help of soil microbes), rebuild the low soil organic matter (carbon

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↑ A seedbed was prepared by ripping the sloped areas.



↑ Sloped areas were hydromulched at various stages and showed signs of water pooling





↑ Cover crop growth 5 – 6 weeks after 50 – 70 mm of rain.

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levels) until they reach a point where the soil is conditioned enough to sustain the climax plant species (native plant species), which follows up the ecological succession process.

Until carbon levels in the soil reach the optimum level most climax (native), plant

species will not be activated to germinate. They cannot compete with the soil microbes for moisture and nutrients.

Please reference the attached document with a detailed explanation on how the regenerative ecological rehabilitation program is designed.

— Prepared by Hercules Strydom, Agronomist (Specialising in Biological Farming Enterprises). Hercules Agronomy & Consultancy Services



↑ Treated Temperature reading, left, 45 degrees, and untreated temperature reading, right, 50+ degrees.