Project LEAF

Greening Project – Wilson and Anderson Streets Port Hedland

Project Objectives

This project was initiated by BHP to improve the visual amenity and environmental value of the area

BHP, Curtin University and Greening Australia working together to create a native vegetation buffer to address airborne dust from the industrial area.

The vegetation buffer offers a number of benefits including:

- Developing a climate proof alternative
- Providing a visual screen of tall, dense and complex vegetation between industry and residential areas
- Improving visual amenity, air quality and showcasing Pilbara native species

Local engagement and project partners for project works include:

- IBN Nursery – Supply of seedlings
- Yurra – Partners with Greening Australia for design and install of irrigation, surface treatments, planting and maintenance
- Pilbara Environmental – Qualitive and Quantative monitoring following construction

Project Partners

BHP
Project Principal

Greening Australia
Lead site investigation, design & project delivery

Curtin University
Experimentation & design analysis

YURRA
Landscaping Services

IBN
Plant procurement & material supply

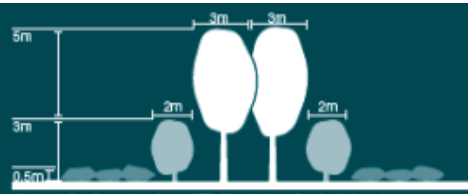
Project Sites

Design parameters and process

Wind Modelling Outcomes

Greening Australia and Curtin University collaborated to identify suitable species to trial for dust capture. Curtin University ran trials using computational fluid dynamics (CFD) modelling and wind tunnel experiments to determine the dust capture and filtration of various species and arrangements.

The species mix and planting configuration for the site is based on the outcomes of the CFD modelling, and includes species with the structure that performed best for dust capture.

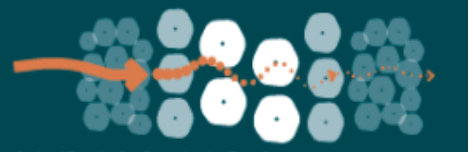


Optimal Configuration from CFD Simulation, Curtin University.

Planting Configuration

Following recommendations of CFD modelling, broad scale planting across the site is arranged in 3 distinct bands - with each band of vegetation arranged so there are no large gaps, but not so dense that the vegetation acts as a solid wall. These bands are:

- Outer band: Low ground covers with a minimum band width of 5m
- Middle band: Ground covers and shrubs with a minimum band width of 2m
- Inner band: Trees with understorey of ground covers, shrubs, and minimum band width of 6m.


Optimal Density Configuration for Dust Capture.

Species Selection

Beneficial plant structure for dust capture was identified as being open, woody species with narrow/fine leaves. The most favourable specimen was found to be *Allocasuarina fraseriana*, providing the highest collection efficiency and lowest pressure drop of all species tested at low and medium flow velocities. Additional species recommended, included *Eucalyptus vitrix*, *Allocasuarina* sp, *Acacia wanyu* and *Melaleuca bracteata*.

Final species mixes selected achieve multi-objectives for the site - including addressing criteria provided by Curtin to ensure dust mitigation - and to meet the following objectives:

- Locally native to the Pilbara area and available from local nurseries
- Diverse species mix for longevity and biodiversity
- Fast growth rate to ensure good coverage and height
- Diverse habit, form and structure to create a naturalistic setting and enhance visual amenity.

Recommended Plant Species and Leaf Shape for Dust Capture.

Typical Section - Based on Optimal Planting Configuration

Project Timeline (Indicative)

Questions?