

# QUEENSLAND MINING INDUSTRY

HEALTH & SAFETY CONFERENCE

2015



## Measurable Water Truck Spray Control System

# ECOSPRAY

PREMIUM

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Australian Diversified Engineering (ADE)



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## Conundrum of risk management

- Manage one risk but create another
  - Dust suppression
  - Watered roads

### Mine Safety Bulletins

- 94 (Jan 2010) – Excessive watering
- 99 (Aug 2010) – Uncontrolled movements
- 112 (Jan 2011) – Mine road safety (road friction)
- 144 (Dec 2014) – Uncontrolled movements (reminder bulletin)

How do we manage the risk?



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## How much water to apply to a haul road?



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## Safe Water Application Rate: $\text{mm}/\text{m}^2$

- Standard form of measurement
- Manage dust suppression and safety
  - Determine safe application rate
  - Have a spray system that can apply the rate

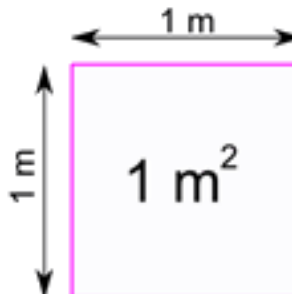
$\text{mm}/\text{m}^2$

$0.3 \text{ mm}/\text{m}^2$

=



300ml





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## How much water to apply?

- Based on science, not perception or individual judgement
- Road friction
  - Friction supply vs friction demand
  - Global Haul Road Friction Protocol

Normal	0.45	Level 1	0.35	Level 2	0.25	Level 3
Level Surface Friction above 0.45		Level Surface Friction between 0.45 – 0.35		Level Surface Friction between 0.35 – 0.25		Level Surface Friction below 0.25
Safe Operations for All Vehicles		Caution for Haul Trucks		Potentially Hazardous for Haul Trucks & Caution for Light Vehicles		Hazardous for Haul Trucks & Potentially Hazardous for Light Vehicles
		OCE/Supervisor to Determine Operational Restrictions		OCE/Supervisor to Determine Operational Restrictions		OCE/Supervisor to Determine Operational Restrictions

The Tulloch/Stocker Friction Model©.



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## Palm Room 3:15pm

Mr David Tulloch

RoadSafety Training Services

Stopping water truck related uncontrolled movements on mine haul roads.



**ROADSAFETY**  
TRAINING SERVICES

**If you can't  
measure the  
risk, you can't  
manage the risk.**



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## Measure the risk

- Road friction
- LV mounted measurement tool



## Manage the risk

- New water truck spray technology
- Monitoring water truck operations



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## Measurable Water Truck Spray System

- True “smart” spray control system
- Definable water application rate
  - Not “High flow” or “Low flow” water output
  - Not a percentage of a changing variable
- Defined input: **mm/m<sup>2</sup>**

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## Consistent Water Application

- Regardless of:
  - Ground speed
  - Engine RPM
  - Truck setup
  - Operator



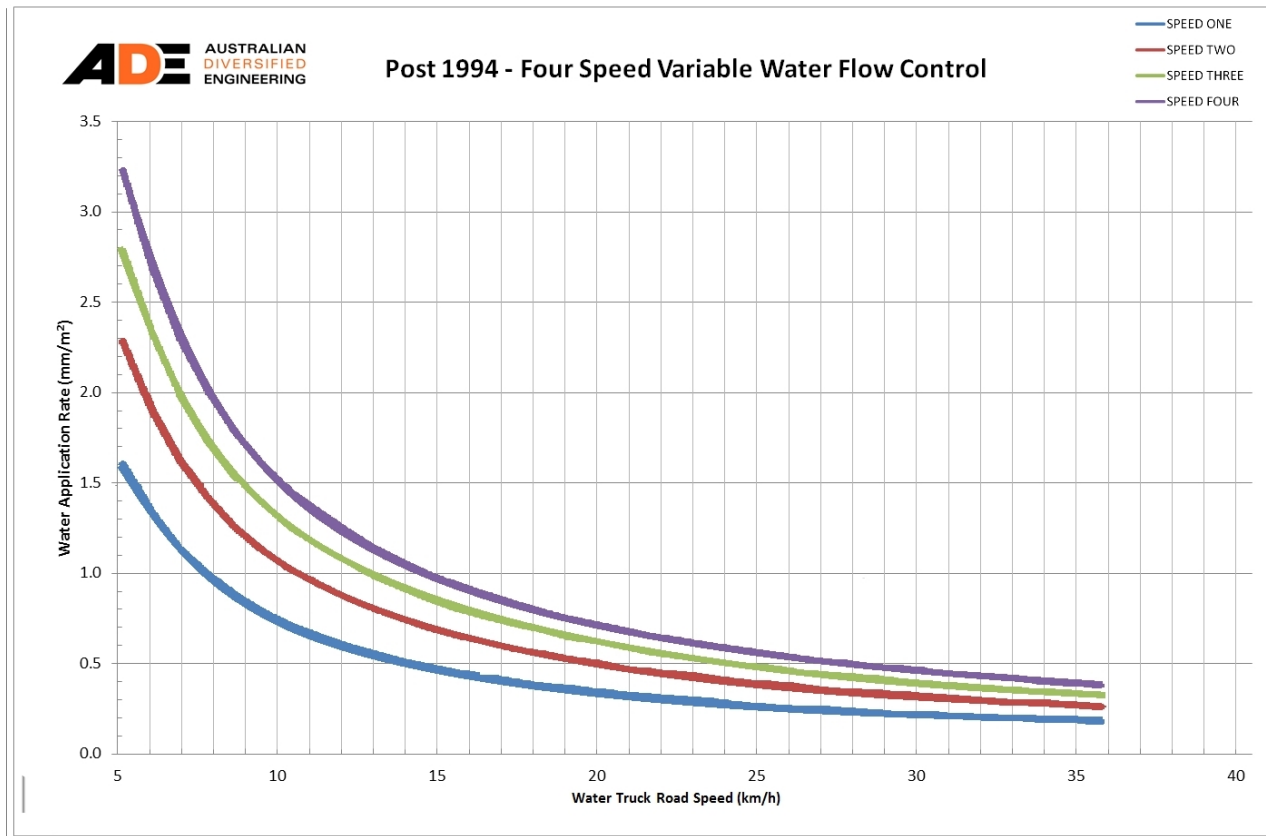
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## Water Application Profile



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## Commercial Benefits of Managing Water

### Reduce overwatering related road degradation & road maintenance

- Spot spots / Pot holes / Road deformation
- Rolling resistance

### Increased capacity of water trucks

- Increased - Average distance sprayed per hour
- Increased - Time spraying vs time not spraying
- Reduced - Overall water usage



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## Spray More Kilometres Per Tank

### 1 Truck Assessment

777 Water Truck, 70,000L tank, strip spray

- Extra road sprayed:
- Extra time spraying:
- Less water tank refills:
- Less water used:

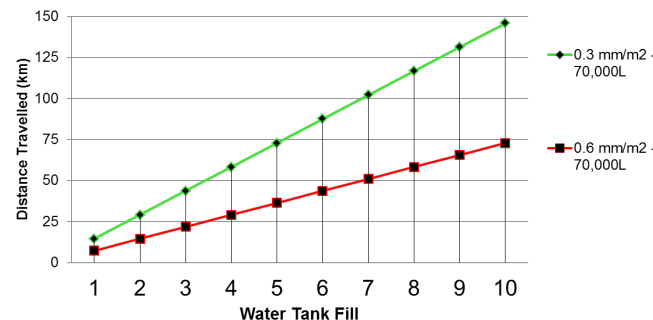
**1 Day** / 1 Year

**68kms** / 25,000km

**2.5hrs** / 38 days

**8** / 3027

**580,000 litres** / 211 million litres





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## Technology & Data

- Data logging
  - Data Reports
  - Incident investigation
  - Operations monitoring
- Remote monitoring & management
  - Live tracking
  - Remote control
- Automation – Geo-fence



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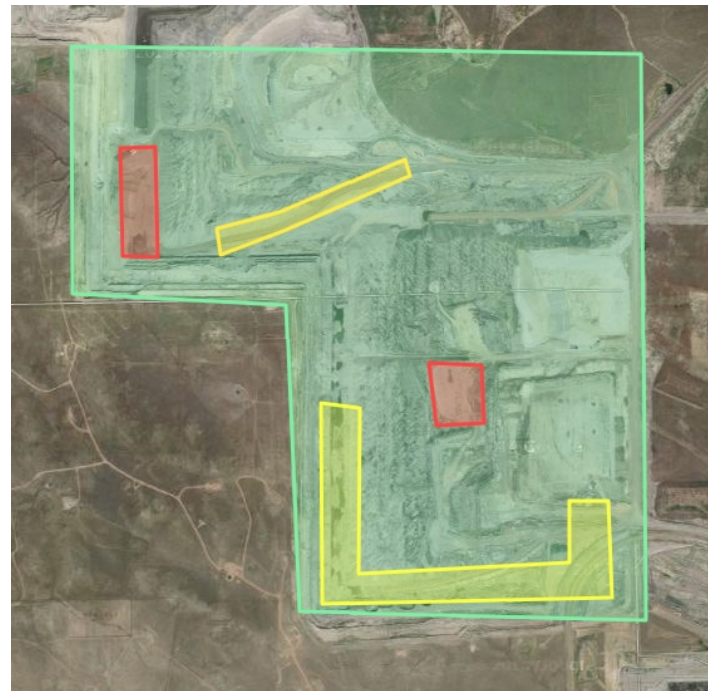
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## Geo-fence Automation

- Mine site default settings
- Priority based geo-fences
- Day / night restrictions
- Blackspot restrictions
- Intersection restrictions



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## Conclusion / Takeaways

- Haul road safety can be managed
- True smart spray system is measurable
- Standard form of measurement: mm/m<sup>2</sup>
- Absolute control with geo-fence technology



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