



BIOSOLIDS MANAGEMENT AT SOUTH EAST WATER

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OVERVIEW

- South East Water
- Biosolids Management
- Biosolids HACCP
- Challenges

SOUTH EAST WATER

- Commenced operation in 1995
- Provides water, sewerage and recycled water services in the south-east region of Melbourne
- One of 3 water retailers in the Melbourne metropolitan area
- 1.5 million people served in a 3640 square kilometre area
- 8 STPs

SOUTH EAST WATER PRODUCTS

- Drinking Water
- Recycled Water
- **Biosolids**
- Effluent for environmental discharge
- Sewage (as an ingredient of recycled water)
- IWMS products (eg. Sewer mining, Storm water)

SOUTH EAST WATER PRODUCT QUALITY OBJECTIVES

1. That our products be safe, sustainable and satisfy customer need.
2. That our products are backed by quality systems that emphasise optimal performance and accountability.

SOUTH EAST WATER QUALITY SYSTEM


BUSINESS WIDE
ISO9000 ISO14000 AS4801
HACCP & ISO22000

PRODUCTS

Drinking Water – IWMS (alternative sources)
Raw Sewage – Discharge Effluent – Recycled Water – **Biosolids**

South East Water Sewage Treatment Plants

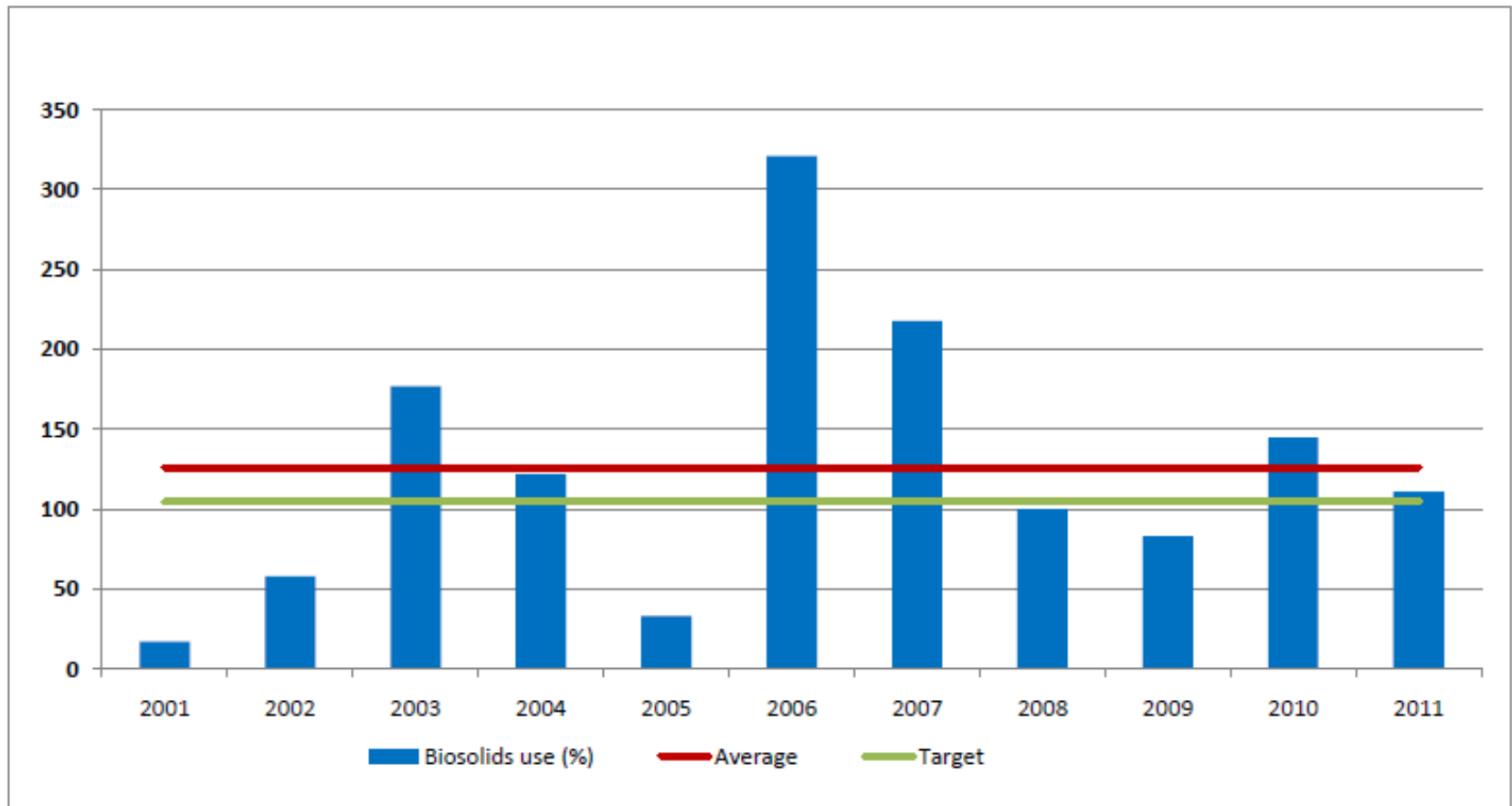


-  Melbourne Water Sewage Treatment Plant
-  South East Water Sewage Treatment Plant

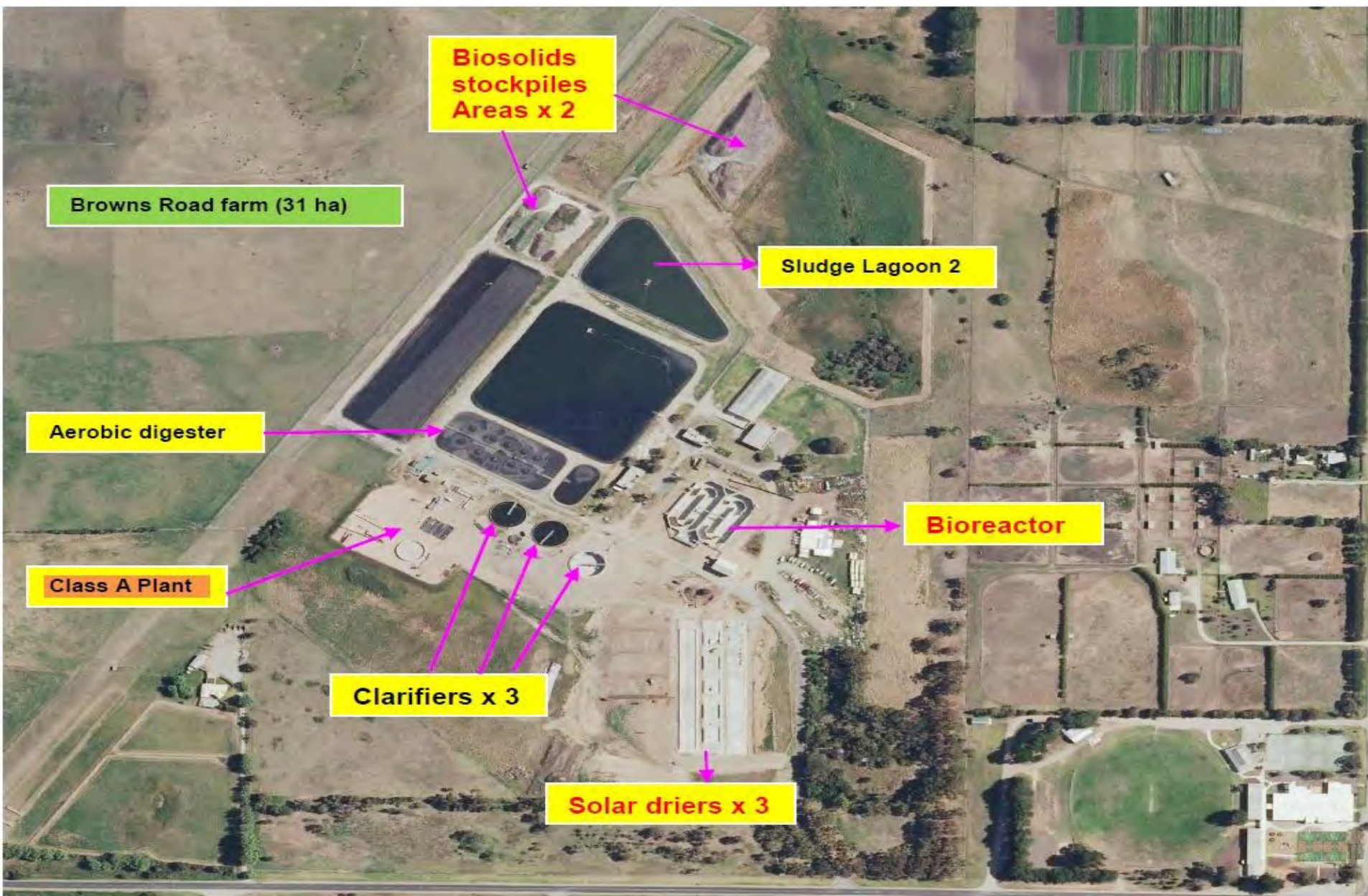
2010-11 ESC REPORTING DATA (tDS)

South East Water STP	Sludge Produced	Sludge Stored	Biosolids Used
Boneo	529	5150	789
Somers	225	2367	835
Mt Martha	665	2198	349
Pakenham	433	3608	194
Blind Bight	29	225	0
Koo Wee Rup	27	261	0
Longwarry	33	467	0
Lang Lang	13	60	0
TOTAL	1954	14355	2163

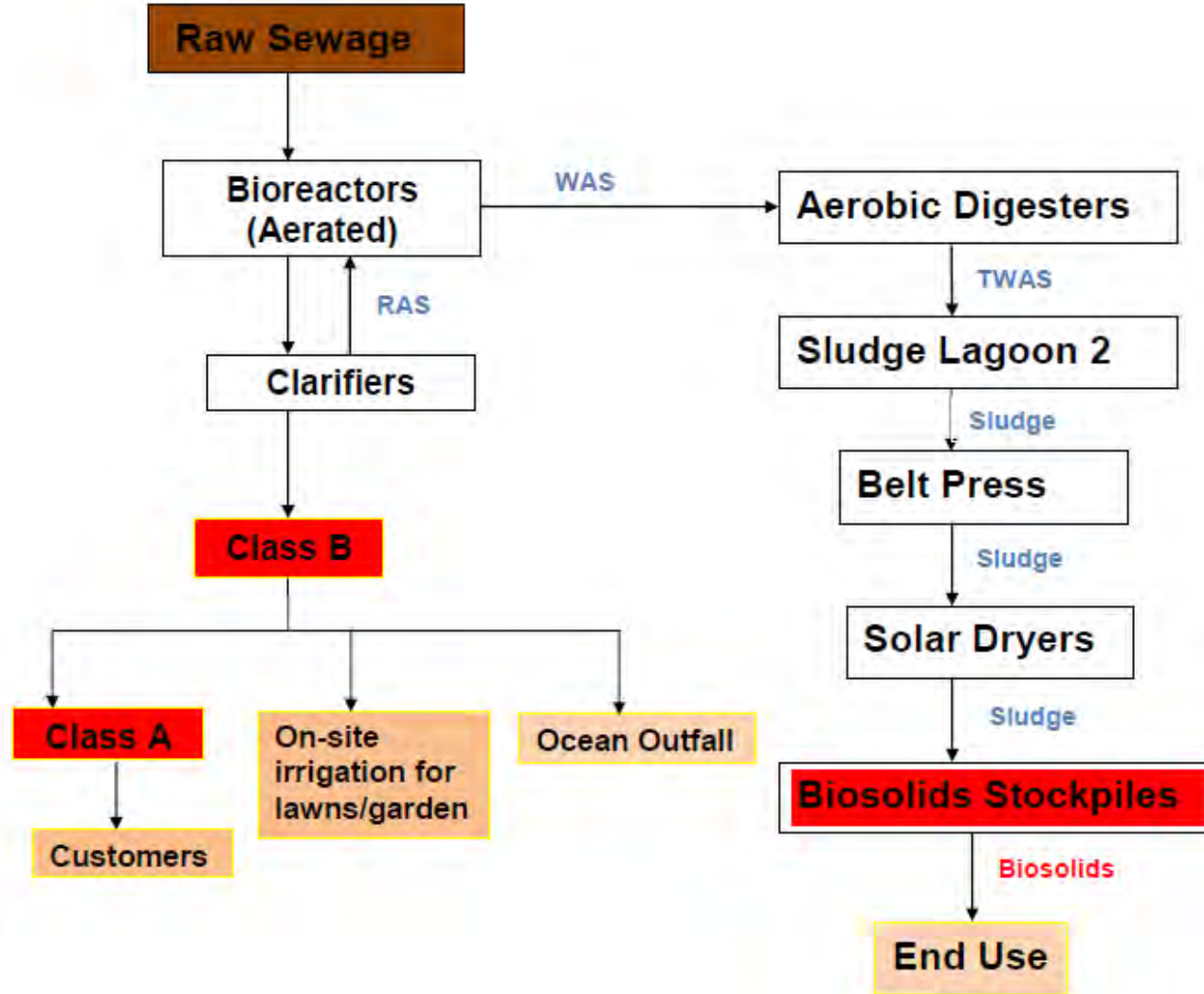
SOUTH EAST WATER'S BIOSOLIDS ANNUAL PERCENTAGE USAGE



BONEO STP – 8 ML/DAY PLANT



BONEO STP



BONEO STP – SLUDGE LAGOON 2



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BONEO STP – BELT PRESS



BONEO STP – BELT PRESS



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BONEO STP – SOLAR DRYERS



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BONEO STP – SOLAR DRYERS



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BONEO STP – SOLAR DRYER SLUDGE



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BONEO STP SOLAR DRYER SLUDGE CHARACTERISATION

Parameter	27 April 2011 (n=3)
Nitrogen (%)	4.6
Phosphorus (%)	1.9
Available K (mg/kg)	860
Total Organic Carbon (%)	23
C:N ratio	5.5
Treatment Grade	T3
Contaminant Grade	C2

So what other product is competing with biosolids ?

Which is Which ?



Poultry Litter



Broiler (meat birds) litter

Biosolids



So what are some facts on Poultry Litter ?

- 170,000 tons in Victoria
- Not usually composted prior to sale
- Largest users are vegetable growers (A\$10-15/m³)
- Little EPA regulation to date
- Industry „self-regulation“ – e.g. Vic Broiler Code
- Enteric bacteria can be found in the end product
- Tendency to over apply



BONEO STP SOLAR DRYER – HEALTHY LOOKING TOMATO PLANTS ?



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BONEO STP SOLAR DRYER – HEALTHY LOOKING TOMATOES ?



BONEO STP SOLAR DRYER – PATHOGEN FREE TOMATOES ?

Pathogens	Solar dryer tomatoes	Woolworths tomatoes
<i>E. coli</i> (org/g)	<0.3	<0.3
Salmonella (org/25g)	Not detected	Not detected

BONEO STP – SOLAR DRYER 2010 STOCKPILE



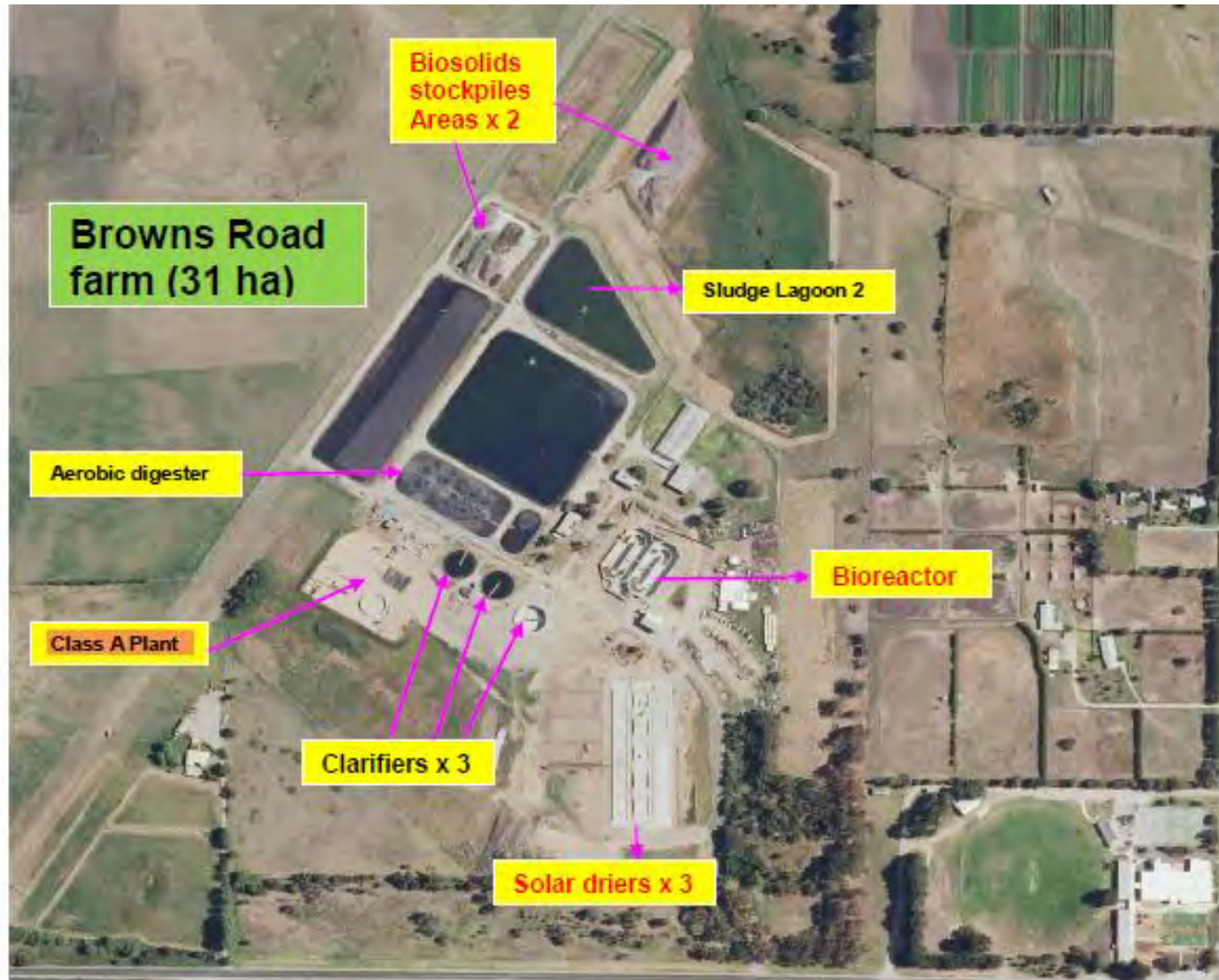
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BONEO STP – OLDER STOCKPILES



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BONEO STP – SOUTH EAST WATER OWNED LAND



BONEO STP – BIOSOLIDS TRANSPORT

2001 STOCKPILE



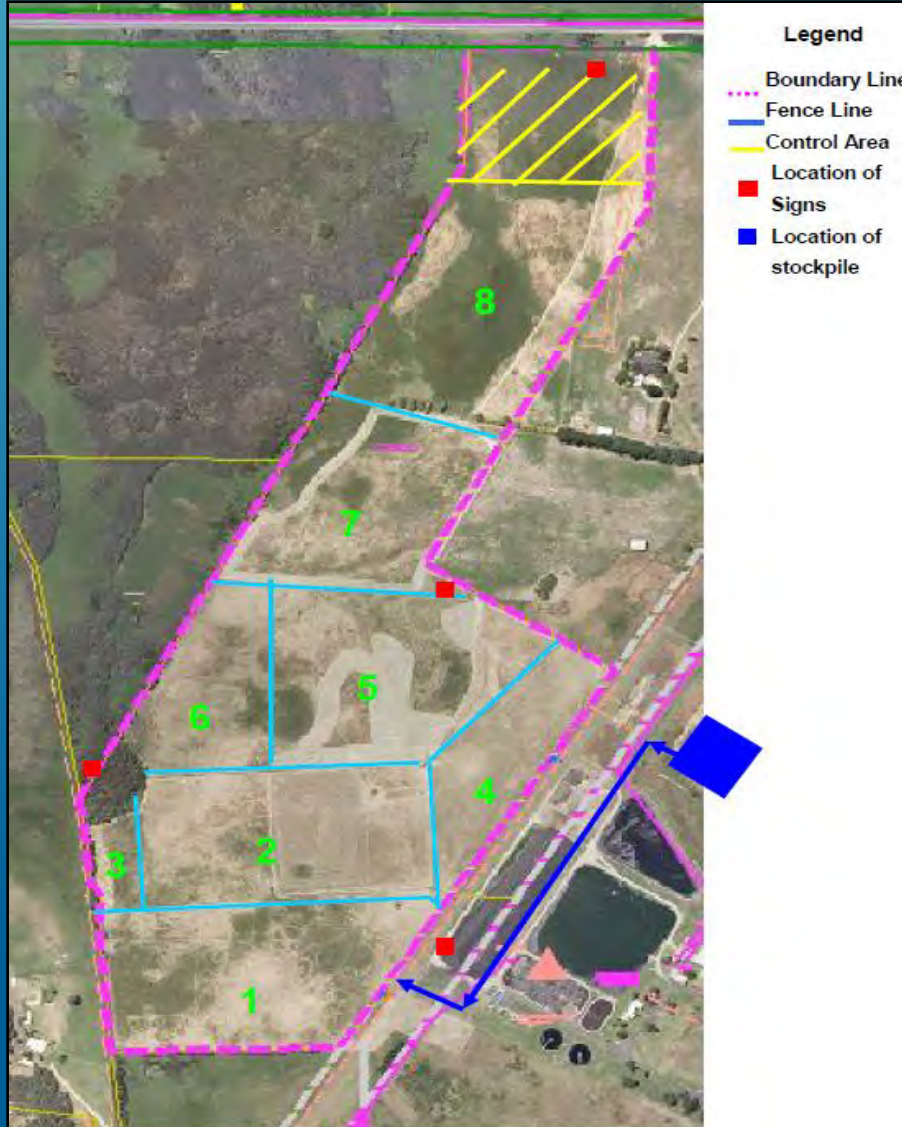
BIOSOLIDS TRANSPORTED TO BROWNS ROAD FARM



BROWNS ROAD FARM – BIOSOLIDS SPREADING



BONEO STP – BIOSOLIDS REUSE AREA



BROWNS ROAD FARM

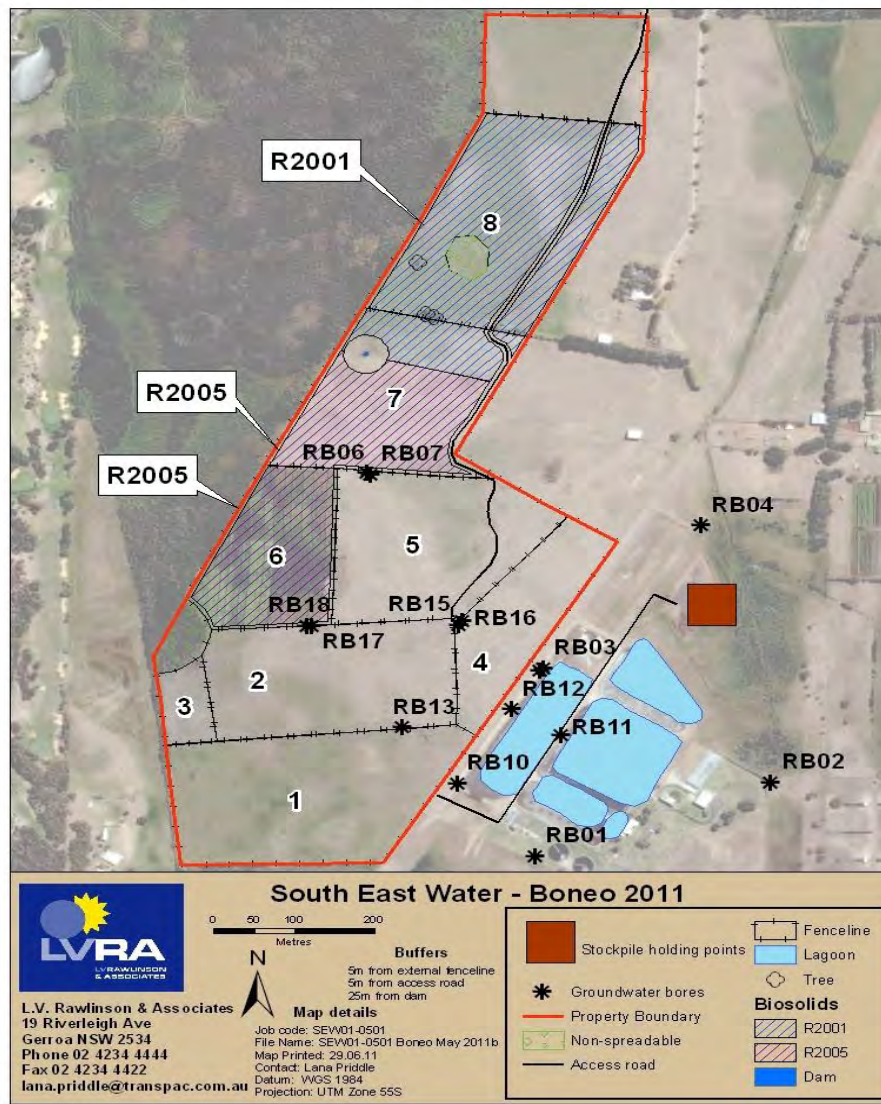
Paddock #	Application year	Application area (ha)
1, 2 & 3	2009	10
4 & 5	2010	7
6, 7 & 8	2011	14
Total		31
Off-site (Caldermeade)	Feb 2012	24

BROWNS ROAD FARM – MARCH 2011 APPLICATION

Paddock 8



POST 2011 APPLICATION REPORT



BONEO BIOSOLIDS - 2012 APPLICATION COMPLETED

Boneo stockpiles	Product wet tonnes	Application rate (Product tonnes/ha)	Application area (ha)
R2005	108	91	1.19
R2006	854	100	8.54
R2007	652	111	5.90
R2008	1099	134	8.19
TOTAL	2714		24

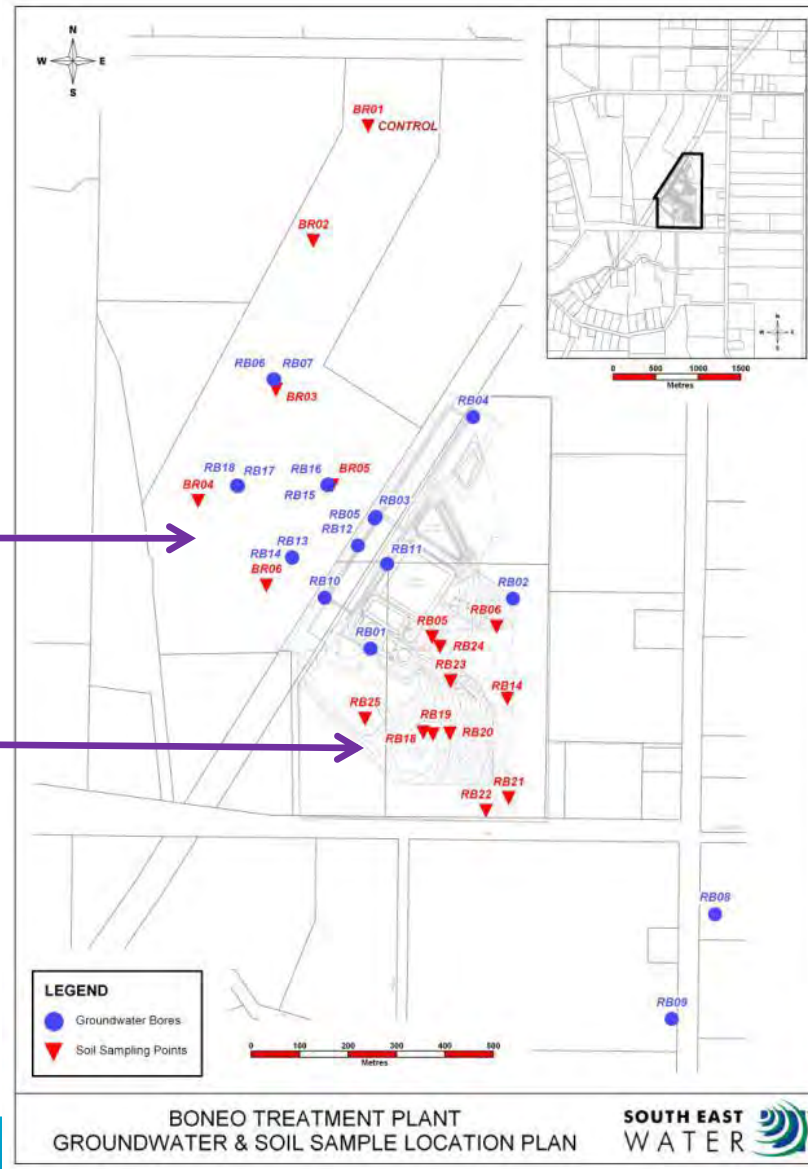
Application site = Caldermeade

Previous application year = 2010

BONEO STP – ENVIRONMENTAL MONITORING

Browns Road
farm (31 ha)

STP area



17 Groundwater bores

16 soil sampling locations

BONEO STP – BIOSOLIDS HACCP

WHAT IS HACCP?

- Acronym for Hazard Analysis Critical Control Point.
- Developed in the 1960"s by NASA to reduce the risk of astronauts becoming ill from food eaten in space flights.
- Now used all over the world by most food industries.
- Primarily used to make a product safe but can be used to manage other quality criteria.

WHAT IS HACCP MEANT TO ACHIEVE?

- Products controlled by a HACCP system are meant to be “in spec” ALL the time.
- A HACCP system is supposed to indentify non conforming product at the earliest possible stage of production.
- HACCP system emphasise roles and responsibilities, procedures for control and corrective action.
- HACCP systems are meant to feed back problems to management efficiently so that management can make the necessary changes to maintain product safety and quality.

BIOSOLIDS HACCP AT SOUTH EAST WATER

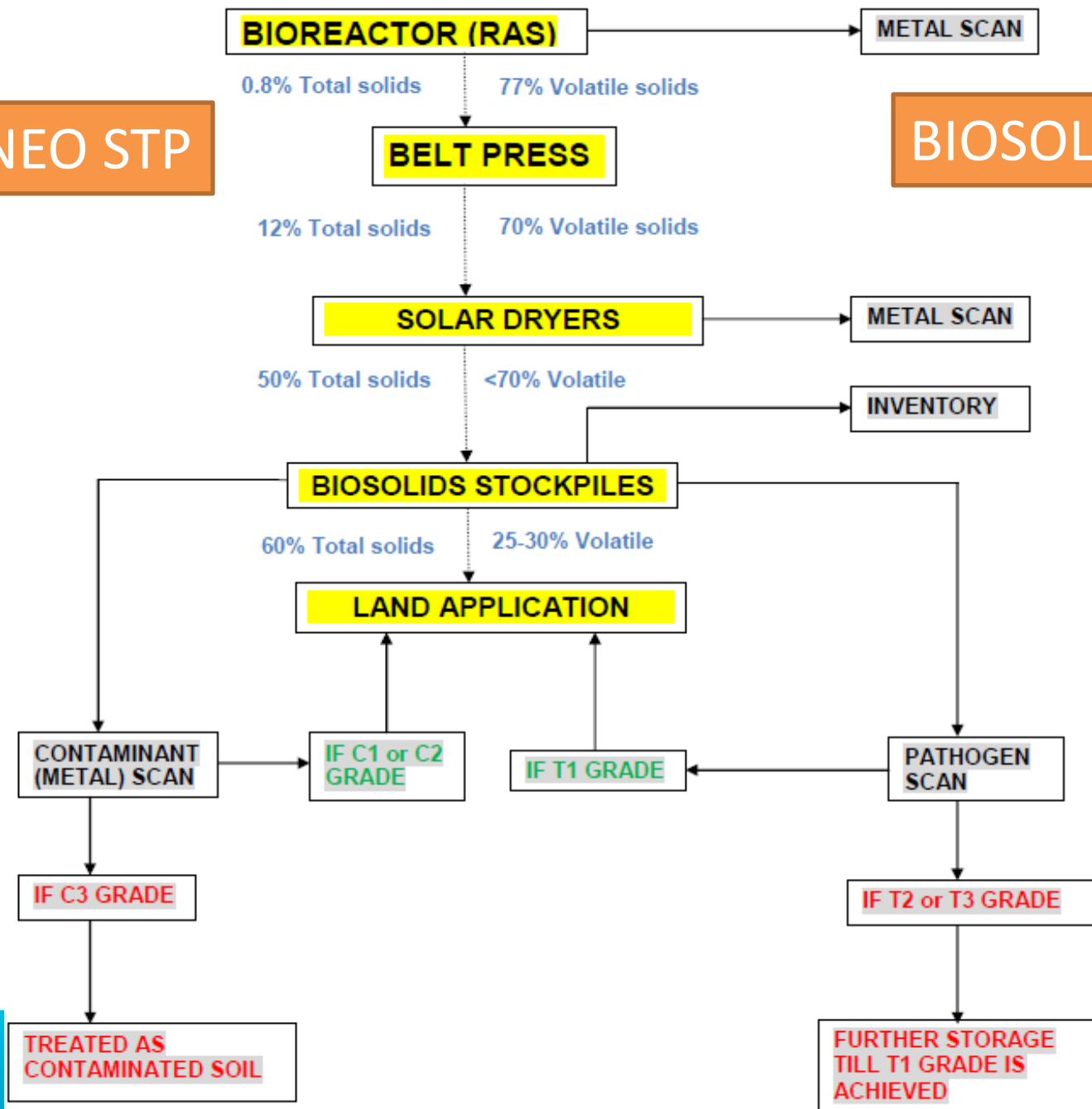
- HACCP requires that all process steps be analyzed for risk.

We have:

- HACCP teams which identify all the process steps and carry out a “what can go wrong” for all steps.
- A document controlled HACCP plan with the process and risks listed.

BONEO STP

BIOSOLIDS HACCP



RISK MANAGEMENT ACTIONS

- Biosolids risk management framework
- Annual biosolids risk review
- EPA approved EIPs
- Biosolids HACCP
- Environmental monitoring
- Regular R&D scan
- R&D collaboration

CHALLENGES

- Meeting annual 105% biosolids reuse target
- Development of off-site (external land) biosolids use
- Reduction of source contaminants that are restricting the potential for maximal reuse of biosolids (copper, zinc, cadmium, selenium & mercury) - if we could get to C1 there would be a wider range of potential uses and maybe greater potential to sell biosolids.



THANK YOU