



LICENCE/WORKS APPROVAL NUMBER: L8334/2009/2
LICENCE/WORKS APPROVAL FILE NUMBER: DEC10417
APPLICATION DATE: 15/05/2012
EXPIRY DATE: 26/07/2017

PREMISES DETAILS

LICENSEE/WORKS APPROVAL HOLDER

Mt Romance Australia Pty Ltd
169 Broadway
NEDLANDS, WA, 6009
ACN: 060 122 698

PREMISES

The Sandalwood Factory
Lot 6 on Diagram 85134 and part of Lot 500 on Diagram 100636, Down Rd
DROME, WA, 6330

PRESCRIBED PREMISES CATEGORY

Category number*	Category Description*	Category Production or Design Capacity*	Premises Production or Design Capacity#	Premises Fee Component**
67	Fuel burning: premises on which gaseous, liquid or solid fuel is burnt in a boiler for the supply of steam or in power generation equipment.	In aggregate 2 000 kilograms or more per hour (fuel with a sulphur content of less than 0.25%	2, 650 kg/hr	Not applicable

* From Schedule 1 of the Environmental Protection Regulations 1987

From application

** From Schedule 4 of the Environmental Protection Regulations 1987

This Environmental Assessment Report (EAR) has been drafted for the purposes of detailing information on the management and mitigation of emissions and discharges from the prescribed premises. The objective of the EAR is to provide a risk assessment of emissions and discharges, and information on the management of other activities occurring onsite which are not related to the control of emissions and discharges from the prescribed premises activity. This does not restrict DEC to assessing only those emissions and discharges generated from the activities that cause the premises to become prescribed premises.

Basis of Assessment

The Sandalwood Factory, which has been assessed as "prescribed premises" category number 67, under Schedule 1 of the *Environmental Protection Regulations 1987*.

Category 67 "Fuel burning: premises on which gaseous, liquid or solid fuel is burnt in a boiler for the supply of steam or in power generation equipment."

In aggregate 2, 000 kg or more per (fuel with a sulphur content of less than 0.25%)

Mount Romance Australia (MRA) accept Blue Gum plantation offcuts, with a sulphur content of less than 0.01%, to fuel the 6 MW Waste Wood Fired Boiler (WWFB), which provides steam for the steam distillation process in the manufacturing of sandalwood oil. The WWFB, which has replaced



a 4MW Recycled Oil Fuelled Boiler, has a nominated throughput of 1, 200 – 2, 000 kg per hour. The WWFB is the only prescribed activity on site at The Sandalwood Factory; however a Water Softening Plant feeds water to the WWFB, which then produces steam for the Distillation Unit that produces sandalwood oil. As such, all of these processes are considered under this assessment report.

1.0 BACKGROUND

1.1 GENERAL COMPANY DESCRIPTION

MRA is an Australian company with its operations based in Albany, Western Australia. The company has been operating since 1996 as a manufacturer of skin care and cosmetic products, a tourism destination and producer of essential oils for use in fine fragrances. The essential oil part of the business constitutes the largest component of MRA with approximately 90% of the product exported around the world. MRA have obtained Organic Certification on their sandalwood oil, demonstrating a commitment to sustainable harvesting and processing practices. MRA has signed up to a Water Efficiency Management Plan with the Water Corporation. This plan commits MRA to a range of long term and short term actions to reduce water consumption. MRA replaced their 4 MW Recycled Oil Boiler with a 6 MW Waste Wood Fuelled Boiler in an attempt to become carbon neutral in their operation of The Sandalwood Factory (MRA) and meet the environmental demands of international export customers. The WWFB operates 351 days of the year, with a two week shut down for maintenance. The 4 MW Oil Fired Boiler is used during periods that the WWFB is shut down to continue production, albeit at a lower rate.

1.2 LOCATION OF PREMISES

The premises (Figure 1) are located on the Albany Highway, approximately 15 km north of Albany, in the Mirimbeena Industrial Estate. The area is zoned as Special Industry and there is a buffer zone on three boundaries zoned Special Use. Situated within a 2 km radius is areas zoned Rural, Parks and Recreation and Public Purposes. There are 5 neighbouring residences within 2 km of MRA, with the closest residence approximately 150 metres east of the premises. Neighbouring business activities are agriculture, plantation timber and light industrial.

Soils in the area can be summarised as dark brown sand with silt top soil overlaying sandy gravel, white silty clay and dark very hard silty gravel. Drainage though the soil is poor. The proposal did not require the clearing of native vegetation and the premises is not within any nature reserves or water ways. The closest nature reserve located 500 m south, on the eastern side of Albany Highway. There are no catchment areas for drinking water near the premises. No Aboriginal Sites have been identified in the area. There are 3 groundwater bores within a 1 km radius of the premises and one groundwater bore located on the eastern boundary of the premises. Groundwater in the area is at approximately 12.5 m depth, sometimes ranging between 7.5 – 14.3 m. The long term median annual rainfall in Albany is approximately 930 mm although it can vary significantly (e.g. 1395 mm in 1955; 629 mm in 1972) (BOM 2008). Most of the rainfall, approximately 70%, occurs between May and October. The average annual pan evaporation at Albany Airport is approximately 1390 mm, with mean daily figures ranging from 2 mm in winter up to 7 mm in summer (BOM 2008).

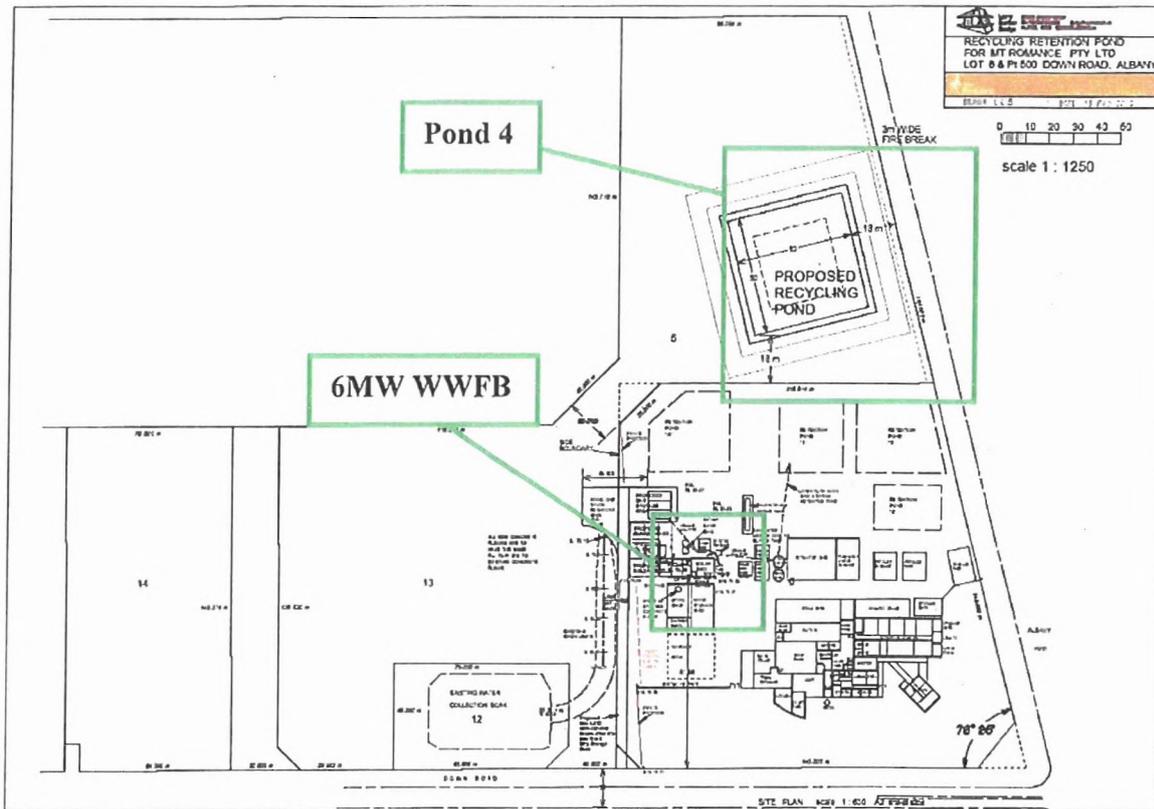


Figure 1. Site plan of The Sandalwood Factory showing pond 4 (receives boiler blow down, cooling tower bleed off, and water softener regeneration waste water discharge) and the 6 MW Wood Fired Boiler and associated infra-structure marked in green.

1.3 PROCESS DESCRIPTION

MRA operate a WWFB to produce steam, which is used in the distillation process to manufacture essential oils (see Figure 2). The WWFB requires "softened" water to be operated safely and efficiently. In order to access "soft" water MRA have to chemically treat the mains (scheme) water provided in the Water Softening Plant. The softened water is fed to a Boiler Feed Water Tank that then feeds the water into the WWFB. The WWFB has a conveyer belt feeding wood fuel into it. This wood fuel is combusted, heating the "softened" water carried in water tubes to produce steam. The steam leaves the WWFB in pipes that flow to the Distillate Shed. In the Distillate Shed steam is passed through each of the fourteen 300 l Distillate Units, each of which use 1500 kilos of sandalwood chips to extract the sandalwood oils. It takes eight days to distil 30 L of sandalwood oil from the chips. After the steam has passed through the Distillation Units it is piped to Cooling Towers where it is cooled and then returned to the WWFB for reuse.

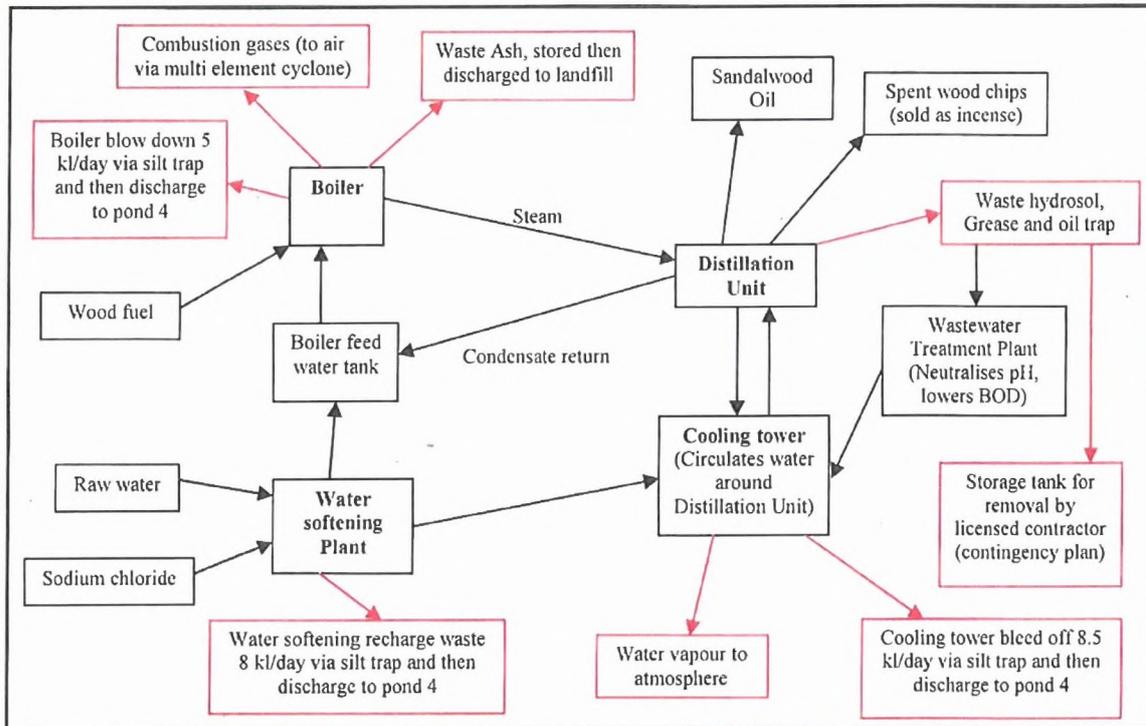


Figure 2. Overview of the process occurring onsite at Mt Romance Biomass Plant (red lines indicate outgoing emissions).

6 MW Waste Wood Fired Boiler

The WWFB is a fixed combustion grate 6 MW Wood Fired Water Tube Boiler manufactured by Coalbrix Boiler Industries Pty Ltd. Classified as an unattended boiler, the WWFB has wood constantly fed into the combustion chamber on a conveyer system. The WWFB has been constructed and installed in accordance to the relevant Australian Standards. Wood combustion provides heat to the water tubes that run through the WWFB, making steam for the distillation process. Combustion is controlled by an Allen Bradley PLC that controls and displays parameters including, but not limited to, burner firing rate; fan speed and efficiency. This includes combustion will fuel and air flows being monitored and regulated continually. Thermal efficiency of the WWFB is approximately 80%, meeting design standards set by the New Zealand Ministry for the Environment which recommend a design thermal efficiency of 65%. A combustion stack vents air emissions produced by the burning of wood.

A multi-element cyclone trap captures suspended particulates before exhaust air leaves the 24 m stack. The multiclone trap cannot be removed from the stack but must be checked and cleaned regularly to maximise efficiency. MRA performs daily inspections and maintenance of all WWFB equipment, including efficient boiler and multiclone operation. The maintenance regime includes a comprehensive inspection and service of the WWFB by a suitable qualified engineer every five weeks. Part of the five weekly services includes a combustion check to ensure efficient combustion with monitoring of combustion gases. An annual service is conducted, also by a suitably qualified engineer, to ensure safe and correct operation of all boiler and multiclone operating systems. Part of the annual service also involves a combustion check to ensure efficient combustion with monitoring of combustion gases. Further to the monitoring and maintenance regime, MRA have fitted an in line obscuration meter to monitor visual particulates in combustion gases released after they have passed through the multiclone. An alarm is fitted to the obscuration meter, which is attached to an alarm that is triggered by 25% obscuration being exceeded. 0% obscuration occurs when no



particulates are present, 100% obscuration occurs when particulates are dense, fully obscuring the air. When this alarm sounds operators will respond by checking for correct operation of the boiler combustion systems (i.e. PLC, fans, fuel feed system and fire beds). If operators cannot correct the problem the issue is escalated to MRA's Engineer and then Plant Manager. If these personnel cannot solve the problem then it is further escalated to MRA's combustion engineers or the suppliers.

The maintenance regime ensures that the multiclone is regularly inspected to optimise its efficiency. In the initial stages of operation, the multiclone was continually emptied via grit refiring. The ash was returned to the combustion box where it was refired and combusted or removed with the ash from the fire box. This emptying was for the purpose of cleaning out the multiclone; however during operation it was found that the process did not reduce the amount of ash produced from the boiler and increased the frequency of shut-down without any additional benefit and is therefore no longer undertaken. A narrow stack tip (460 mm) is used to disperse the combustion gases more rapidly as they leave the flue. Firing conditions at MRA indicate that the stack will not require annual cleaning. The annual service does include inspection of the stack and it will be cleaned as necessary. Stack monitoring was undertaken upon commissioning of the WWFB to confirm air modelling estimates for criteria pollutants. A report was submitted with compliance documents to the DEC verifying compliance with all relevant guidelines and standards.

To remove the salts left behind by water after it evaporates the boiler needs to be blown down, producing a boiler blow down waste stream. An automated dosing of boiler chemical is used to reduce scaling and ensure precipitates are dropped out in boiler mud. If blow down is not performed then salts build up, causing damage to the boiler and compromising safe operation. The boiler blow down waste stream (see Table 2) mixes with water softener regeneration waste to settle in a sump, before being pumped to evaporation pond 4 (see Figure 1). At maximum operating capacity approximately 5 kL of boiler blow down is emitted per day.

Ash waste is produced from burning wood in the WWFB. At maximum throughput 330 kg of ash will be produced per day. This waste is taken to a licensed landfill facility for disposal.

Table 2. Waste water composition emitted from each process stream.

Discharge	Volume kL/day	TDS (mg/l)	pH	Nitrogen (mg/l)	Phosphorus (mg/l)	BOD (mg/l)	Discharge Point
Boiler Blow Down	5	2,000	11	<13	10-40	n/a	Pond 4
Cooling tower bleed off	8.5	3,500	8.5	n/a	n/a	n/a	Pond 4
Water softening process	8	6,700	7.6	0.1	0.13	n/a	Sump 2 → Pond 4
Steam distillation	20	n/a	3.5	30	1.6	3,900	WWTP → Cooling Tower. Storage tank(s) for carting offsite as contingency

Water Softening Plant

The Water Softening Plant removes undesired salts from mains water through the addition of an anion exchange resin. Calcium and magnesium saturate the anion resin, which needs to be replenished with sodium chloride. Waste generated from this "softening" process, at maximum operating capacity, is 8 kL of waste water and 50 kg of sodium chloride per day (see Table 2). Waste water from the plant is discharged via a sump, where it mixes with



boiler blow down waste before being discharged to evaporation pond 4 (see Figure 1). After commissioning, MRA installed a water bore that extracts considerably "softer" groundwater, with lower salinity (10mg/l) than that supplied by scheme water (200mg/l). MRA has had a reduction in the water softening waste stream from 8, 000 L per day to an average of 400 L per day since using the groundwater bore.

Steam Distillation Unit

The Steam distillation process involves the passing of steam through 1.5 vats of Sandalwood chips. This process distils sandalwood oil from the Sandalwood chips. Fourteen of the 300 L distillation units are operational in the Distillate Shed. A high organic, low pH, waste stream is generated from the distillation process (see Table 2). Due to the high biological oxygen demand (BOD) in the distillate waste water, this waste stream is considered to be a "Controlled Waste" by DEC unless adequately treated. The distillate waste passes through a grease and hydrosol trap, where lower grade oil is collected to be used in products, such as incense. After recyclable oil has dropped out the distillation waste is pumped to a wastewater treatment plant (WWTP) which uses aerobic digestion to neutralise pH to approximately 7.3 and lower BOD to <50mg/L. The treated wastewater is then reused in the cooling tower with the bleed off water being sent to evaporation pond 4. The site was originally designed such that the untreated distillate wastewater would be directed straight to a 20 kL storage tank and two 25 kL storage tanks, resulting in a storage capacity of over 60 kL for collection by a controlled waste contractor. The WWTP was installed in 2009, and since this time it has been expanded with the inclusion of an additional clarifier and aeration tank. 20 kL of the distillate waste stream is produced, at maximum operating capacity, per day. The distillate waste can still be collected from the storage tanks by a licensed contractor to be disposed of at a licensed facility as a contingency measure.

Cooling Tower

The Cooling Tower circulates water from and to the factory. The water softening plant, wastewater treatment plant and rainwater caught on rooftops, provides water that flows into the steam distillation units (in a separate pipe) to cool the vapours produced in the distillation process. After the water has flowed past the steam distillation units it returns to the Cooling Tower and water vapour is released, from latent heat of evaporation, to the atmosphere. MRA ensure that regular cleaning and maintenance checks are undertaken by staff and external contractors, which includes testing and reporting of microbiological growth, including Legionella. The towers are automatically dosed with inhibitors to prevent corrosion and microbial growth. Drift eliminators in the towers minimise airborne water droplets around them. At maximum throughput 8.5 kL of cooling tower bleed off (see Table 2 for a break down of the waste stream) is released, per day, to evaporation pond 4. Approximately 50 kL of water vapour is released, from latent heat of evaporation, to the atmosphere. This waste stream mixes with boiler blow down and water softener regeneration waste in pond 4.

Evaporation Ponds

MRA has committed that waste water emissions generated by the WWFB and its associated processes are only to be discharged to a 50 m x 50 m evaporation pond (pond 4 in Figure 1). Table 3 shows the water quality in ponds that received the 4 MW Recycled Oil Boiler waste streams (ponds 1 and 2 in Figure 1) when it was operation. The waste streams received by Pond 4 are similar in quality. Pond 4 has a maximum depth of 3.0 m and a subsequent capacity of 3, 750 m³. The surface area is 2, 500 m². Local clay and soil has been sourced locally and compacted to achieve a permeability of less than 1 x 10⁻⁹ ms⁻¹. Depth to water table at the closest monitoring bore to the site, approximately 370 m northwest of the premises, is 12.5 m. There is more than 2 m between the highest anticipated wet season



watertable and the underside of pond 4, satisfying containment design requirements in the Water Quality Protection Note (WQPN) released by the Department of Water (DOW) (2006), *Liners for containing pollutants, using engineered soils*. MRA hired an engineer to construct pond 4 in accordance to the WQPN and has submitted a geotechnical certificate to confirm compliance. All wastewater is carried from discharge points to pond 4 in covered pipes with a permeability of less than $1 \times 10^{-9} \text{ ms}^{-1}$.

Table 3. Water quality in ponds that received waste streams* from the 4 MW Recycled Oil Boiler

Parameter	Pond 1	Pond 2
Conductivity (us/cm)	7,900	7,000
BOD (mg/l)	60	20
pH	8.3	8.3
TN (mg/l)	27	17
TP (mg/l)	0.7	0.8
TDS (mg/l)	4,500	4,000

*Waste stream is a combination of water softening recharge, boiler blow down, and cooling tower bleed off

Table 4 summarises MRA's overall waste water discharge from the premises. MRA rely on water cartage to maintain a zero water balance in pond 4. Daily inspections are performed by MRA staff to monitor and manage pond 4. Pond capacity is assessed and a minimum free board of 500 mm maintained by MRA keeping abreast of weather forecasts and planning for cartage of water offsite by a licensed contractor in advance when heavy rainfall is predicted. When heavy rainfall is expected at the same time as high production MRA arrange for water to be carted offsite before capacity problems arise. MRA ensure excess water does not accrue onsite and that pond 4 always has a freeboard of 500 mm due to their careful management of inflows and cartage, when required.

Table 4: Annual water balance equation for pond 4 (worst case: calculated at 100% capacity at a 1 in 10 year rainfall event).

Input / output	Volume (kL)
Wastewater volume	2 032
Annual evaporation rate	-3 470
Rainfall influent	2 398
Evaporation by cooling towers (WWTP)	-840
Cartage offsite by licensed contractor	-120
Net water balance	0

Note: Table 4 is calculated on a 1 in 10 year rainfall event with production occurring at 100% capacity for the year. MRA estimate waste water generated will be lower than is presented here (worst case). Influent calculations have been determined using water obtained from an on site water bore. It is assumed that the pond will be empty at the beginning of the year.

Rainwater Runoff

Storm water from hardstand and car park areas is collected onsite on rooftops for reuse in Cooling Tower operations. Other rain water is collected in soak well sumps on site and then overflows into stormwater drains if these fill. MRA endeavour to keep waste water discharge separate from stormwater, ensuring that no contaminants are discharged off site. Drains to effluent ponds are covered, which prevents escape of effluent to the environment and inflow of rainwater into ponds. There are channels and mounds around effluent ponds to prevent storm water runoff entering effluent ponds.

Fuel Supply and Storage



MRA has entered into an agreement with Vancouver Waste Pty Ltd (VW) to supply a minimum of 10, 000 tonnes of wood per annum. Up to 300 tonnes of wood, *Eucalyptus Globulus* (Bluegum) and *Pinus Radiata* (Pine), is stored on site at a time, which is the amount required for 7 days production. Waste wood is provided from limbs and bark that are stripped from the tree in harvesting and coppicing operations and presently left in the field. Alternative fuel sources have been sourced by MRA in case VW are for any reason unable to meet their contract obligations. Plantation Energy, beginning operation in February 2009, are able to supply wood pallets for fuel. The Albany Port Authority is also able to supply waste wood chips from ship loading operations.

Fuel specifications place the sulphur content of wood at 0.01%. Although MRA planned for all 300 tonnes of wood to be stored in enclosed areas they have found this to be unachievable. The wood chip storage area is capable of storing one day production of wood fuel. Four days production of wood fuel is stored in concrete bins, without overhead cover. The balance (two days production of wood fuel) is stored on the ground in the open. There is material handling equipment associated with the boiler to manage fuel handling, which includes:

- A day bin to hold the fuel to feed the burner
- A covered storage area that can hold one days production of the wood fuel.
- A conveyor system to move fuel from the bulk storage area to day bin and from day bin to boiler.

1.4 REGULATORY CONTEXT

1.4.1 Part IV Environmental Protection Act 1986, Environmental Impact Assessment

Not referred as this project is not considered as a significant proposal.

1.4.2 Part V Environmental Protection Act 1986, Environmental Management

Stack monitoring was required by works approval Conditions to confirm air modelling estimates for criteria pollutants from the WWFB. A report was submitted with compliance documents to the DEC verifying air emissions comply with all relevant guidelines and standards. The works approval also imposed a Condition requiring a geotechnical report detailing the design and construction of the effluent pond that receives high TDS wastewater from the WWFB. MRA provided the geotechnical report and produced evidence that demonstrates the pond complies with DEC's relevant standards and guidelines.

COMPLIANCE HISTORY

A compliance inspection of the site in August 2010 found the site to be operated in compliance with all licence conditions; however an unauthorised discharge (diesel) was noted on site due to a pump overflow. The issue was promptly addressed after being raised by DEC.

DEC will administer the following regulations to manage this site:

- *Environmental Protection Regulations 1987*
- *Environmental Protection (Controlled Waste) Regulations 2004*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environmental Protection (Noise) Regulations 2004*
- *National Environmental Protection Measure for Ambient Air Quality*



DEC guidelines that also apply to the proposal:

- Water Quality Protection Note 27: *Liners for containing pollutants, using engineered soils*. **Department of Water, February 2009**
- *Air Quality Modelling Guidance Notes*. **Department of Environment and Conservation, March 2006**

Australian Standards that apply to the WWFB:

- AS 1228-2006 *Pressure equipment – boilers*
- AS 1271-2003 *Safety valves, other valves, liquid level gauges, and other fittings for boilers and unfired pressure vessels*
- AS 2593-2004 *Boilers – Safety Management and Supervision Systems*
- AS 4323.1-1995 *Stationary Source Emissions Selection of Sampling Positions*

1.4.3 Other Making Authorities' Legislation which applies

- Department of Commerce
Occupational Safety and Health Act 2004 and regulations – Boiler Licence
- Department of Mines and Petroleum:
Dangerous Goods Safety Act 2004 and regulations

1.4.4 Rights in Water Irrigation Act 1914

No groundwater licence required for the site. Not a proclaimed area under the Act.

1.4.5 Local Government Authority

The premises is located within the City of Albany and has planning approval.

2.0 STAKEHOLDER AND COMMUNITY CONSULTATION

SUBMISSIONS RECEIVED DURING 21 DAY PUBLIC COMMENT PERIOD

The Application for Licence details for this facility were advertised in the West Australian newspaper on 4 June 2012 as a means of advising stakeholders and to seek public comments. One submission was received from the City of Albany reminding of the requirements to comply with the City of Albany Health Local Laws 2001 Part 5 Nuisances and General, Division 1 – Nuisances, under the title Escape of Smoke, etc.

3.0 EMISSIONS AND DISCHARGES RISK ASSESSMENT

The DEC considers that conditions should focus on regulating emissions and discharges of significance. Where appropriate, emissions and discharges which are not significant should be managed and regulated by other legislative tools or management mechanisms.

The following section assesses the environmental risk of potential emissions from the Sandalwood Factory. In order to determine the site's appropriate environmental regulation, an emissions and discharges risk assessment was conducted of the Sandalwood Factory using the environmental risk matrix outlined in Appendix B. The results of this are summarized in Table 2.



ENVIRONMENTAL ASSESSMENT REPORT

Table 2: Risk assessment and regulatory response summary table.

Risk factor	Significance of emissions	Socio-Political Context of Each Regulated Emission	Risk Assessment	DEC Regulation (EP Act - Part V)	Other management (legislation, tools, agencies)
Air emissions NO ₂ (nitrogen dioxide) (point source)	<u>Operation:</u> 1. Maximum ground level concentrations (GLC) from the boiler have been verified through stack testing, under works approval, to be 17.6 µg/m ³ (7% of the NEPM standard of 246.28 µg/m ³ for 1-hour (max)).	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No Conditions	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986
Air emissions SO ₂ (sulphur dioxide) (point source)	<u>Operation:</u> 1. Maximum GLC from the boiler are 7.0 µg/m ³ (1.2% of NEPM 1-hour (max)).	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No Conditions	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986
Air emissions CO (carbon monoxide) (point source)	<u>Operation:</u> 1. Maximum GLC from the boiler were predicted to reach 38 µg/m ³ (0.3% of NEPM 8-hour (max)). Cumulative GLC's for CO (background concentration and boiler emissions) were predicted to reach 663 µg/m ³ (5.9% of NEPM 8-hour (max)).	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No Conditions	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986
Air emissions PM ₁₀ (Particulate Matter <10 µm) (point source)	<u>Operation:</u> 3. Maximum GLC from the boiler have been verified through stack testing, under works approval, to be 8.3 µg/m ³ (17% of NEPM standard at 50 µg/m ³ for 1-day (max)). Cumulative GLC's for PM ₁₀ (background concentration and boiler emissions) are 41.1 µg/m ³ (82% of NEPM standard at 50 µg/m ³ for 1-day (max)).	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	C – licence conditions	LIC – Annual Service and Inspection routine for WWFB. - Service and Inspection Report to be submitted to DEC as part of the annual reporting requirements. - Intent to vary the fuel source from off-cuts from blue gum or pine plantations or wood chips must be reported to DEC, who may impose monitoring requirements to manage anticipated changes to air emissions.	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986



ENVIRONMENTAL ASSESSMENT REPORT

Air emissions Lead (point source)	<u>Operation:</u> 1. Maximum GLC from the boiler were predicted to be 0.0005 µg/m ³ (0.1% of the NEPM standard for 1-year)	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No Conditions	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986
Air emissions PAH (as Benzo(a)-pyrene) (point source)	<u>Operation:</u> 1. Predicted maximum GLC from the boiler have been verified through stack testing, under works approval, to be 0.00022 µg/m ³ (1-hour (max)). Note 10 pg/ m ³ or 0.000010 µg/m ³ ~ level of detection for PAHs	2. Minimal community interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No Conditions	AS 4323.1 – 1995 (Amdt 1-1995) Stationary source emissions – Selection of sampling positions DoCEP - Occupational Safety and Health Regulations 1996 General provisions of the Environmental Protection Act 1986
Dust emissions	<u>Operation:</u> n/a (dust emissions from the WWFB are considered under PM ₁₀ and PM _{2.5} ; no other significant dust emissions are expected during plant operation)	n/a	n/a	LIC – n/a	Environmental Protection (Unauthorised Discharge) Regulations 2004
Odour emissions	<u>Operation:</u> 1. No odour is expected during operation. High BOD distillate waste stream is treated by a WWTP which lowers BOD to less than 50mg/L/20ppm. Storage tanks are able to contain over 60 kL of the high BOD distillate waste stream (3 days waste at maximum production rate), which can be carted offsite to a licensed treatment facility as a contingency (e.g. failure of WWTP).	2. Low level of community interests. Complaints have been received in relation to existing ponds releasing noxious odour. Distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – Standard odour condition	General provisions of the Environmental Protection Act 1986
Noise emissions	<u>Operation:</u> 1. The WWFB has not increased noise emissions significantly from the levels that occurred at the site when the 4 MW Recycled Oil Boiler was operational. This site will operate in compliance with the EP (Noise) Regulations.	1. No interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC – No conditions	EP (Noise) Regulations General provisions of the Environmental Protection Act 1986
Light emissions	<u>Operation:</u> n/a (The works are contained in closed buildings. Light emissions are not expected to be a problem)	n/a	n/a	LIC – n/a	General provisions of the Environmental Protection Act 1986
Discharges to water	<u>Operation:</u> n/a (there are no planned discharges to water). There are no nearby natural surface water features.	n/a	n/a	LIC – n/a	Environmental Protection (Unauthorised Discharge) Regulations 2004



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Discharges to land	<u>Operation:</u> 1. Waste water from the prescribed activity is discharged to pond 4. The waste water has high TDS (approximately 7,000 us/cm) content. The pond has been constructed with an impermeable clay liner.	2. Low level of community interests. Complaints have been received in relation to runoff from ponds and spray drifting over the property boundary.	E – No regulation, other management mechanisms	LIC – Standard Conditions, as per WAELS advice, to maintain a 500 mm freeboard.	Water Quality Protection Note, <i>Liners for containing pollutants, using engineered soils</i> (DOW 2006) <i>Environmental Protection (Unauthorised Discharge) Regulations 2004</i> General provisions of the <i>Environmental Protection Act 1986</i>
Solid / liquid wastes	<u>Operation:</u> 1. Ash waste will be stored onsite and then disposed of at a licensed landfill facility.	1. No interest or concern, distance to the nearest residence is 150 m.	E – No regulation, other management mechanisms	LIC - No conditions	<i>Environmental Protection (Controlled Waste) Regulations 2004</i>
Hydrocarbon/ chemical storage	<u>Operation:</u> 1. All chemicals and hydrocarbons will be stored in banded areas in accordance with Australian Standards.	1. No interest or concern, distance to the closest residence is 150 m.	E – No regulation, other management mechanisms	LIC – Standard chemical storage condition	<i>AS 1940 – 2004 Storage and Handling of Flammable and Combustible Liquids.</i> <i>Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulation 2007</i> <i>Dangerous Goods Safety (General) Regulations 2007</i>
Native vegetation clearing	Clearing of native vegetation will not be assessed as part of this EAR	n/a	n/a	LIC – n/a	<i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i>
Contaminated site identification	Contaminated sites will not be assessed as part of this EAR	n/a	n/a	LIC – n/a	<i>Contaminated Sites Act 2003</i>



4.0 GENERAL SUMMARY AND COMMENTS

This Environmental Assessment Report (EAR) has provided necessary guidance for the regulation of MRA. Stack verification of selected air emissions (NO₂, PM₁₀, and PAH as indicated by Benzo (a) pyrene) from the WWFB indicate that emissions are within the range predicted in the application for works (W4479/2008/1). PM₁₀ is the only air parameter that may have a negative environmental impact. Since the background levels are a significant contributor to the overall PM₁₀ levels, with levels increasing from 17% from the stack to 82% of the NEPM with background levels included, DEC are managing PM₁₀ emissions through a regular maintenance and service program of the WWFB that will minimise air emissions. A condition has also been imposed to ensure that only the wood fuel sources proposed in MRA's initial application are to be burned in the boiler. DEC requires the maintenance and servicing regime be documented and then submitted as part of a boiler annual service report annually.

MRA will be licensed to discharge all wastewater, a mixture of boiler blow down, water softener regeneration waste and cooling tower bleed off, to evaporation pond 4. Compliance documentation has been received by DEC indicating that pond 4 has been constructed with an appropriate material that obtained a permeability of less than 1×10^{-9} ms⁻¹. The underside of the lowest liner of the pond is at least two metres above the highest anticipated watertable. MRA has committed to maintain a minimum free board of 500 mm for Pond 4 at all times. DEC requires MRA to ensure that Pond 4 does not overtop through the water management and weather forecasting procedures that have been outlined in this EAR.

Although odour and hydrocarbon/chemical storage have scored a low risk rating, it is proposed that they will also be managed in the licence using standard conditions. Odour has been identified as an issue historically (via complaint) and chemicals are stored on site.

The premises is awarded an overall environmental risk of low. It is recommended that the licence be reissued for a period of 5 years.

OFFICER PREPARING REPORT

Cassie Bell

Position: Environmental Officer
South Coast
Department of Environment and Conservation
9842 4500
July 2012

ENDORSEMENT

Caron Goodbourn

Position: Regional Leader
South Coast
Department of Environment and Conservation
9842 4500
July 2012



APPENDIX B: EMISSIONS AND DISCHARGES RISK ASSESSMENT MATRIX

Table 3: Measures of Significance of Emissions

Emissions as a percentage of the relevant emission or ambient standard		Worst Case Operating Conditions (95 th Percentile)			
		>100%	50 – 100%	20 – 50%	<20%*
Normal Operating Conditions (50 th Percentile)	>100%	5	N/A	N/A	N/A
	50 – 100%	4	3	N/A	N/A
	20 – 50%	4	3	2	N/A
	<20%*	3	3	2	1

*For reliable technology, this figure could increase to 30%

Table 4: Socio-Political Context of Each Regulated Emission

		Relative proximity of the interested party with regards to the emission				
		Immediately Adjacent	Adjacent	Nearby	Distant	Isolated
Level of Community Interest or Concern*	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Note: These examples are not exclusive and professional judgement is needed to evaluate each specific case

*This is determined by DEC using the DEC "Officer's Guide to Emissions and Discharges Risk Assessment" May 2006.

Table 5: Emissions Risk Reduction Matrix

		Significance of Emissions				
		5	4	3	2	1
Socio-Political Context	High	A	A	B	C	D
	Medium High	A	A	B	C	D
	Medium	A	B	B	D	E
	Low	A	B	C	D	E
	No	B	C	D	E	E

PRIORITY MATRIX ACTION DESCRIPTORS

A = Do not allow (fix)

B = licence condition (setting limits + EMPs - short timeframes)(setting targets optional)

C = licence condition (setting targets + EMPs - longer timeframes)

D= EIPs, other management mechanisms/licence conditions (monitoring/reporting)/other regulatory tools

E = No regulation, other management mechanisms

Note: The above matrix is taken from the DEC Officer's Guide to Emissions and Discharges Risk Assessment May 2006.