



Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8974/2016/2
Licence Holder	Eclipse Soils Pty Ltd
ACN	131 802 661
File Number	DER2016/000832-1
Premises	Abercrombie Road Resource Recovery Centre Abercrombie Road POSTANS WA 6167 Legal description – Lot 115 on Plan 48295 (Volume 2602, Folio 976) and Lot 2 on Plan 29392 (Volume 2219, Folio 775)
Date of Report	21/02/2022
Decision	Revised licence granted

MANAGER WASTE INDUSTRIES

REGULATORY SERVICES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L8974/2016/2 is held by Eclipse Soils Pty Ltd (Licence Holder) for the Abercrombie Road Resource Recovery Centre (the premises), located at Lot 115 on Plan 48295 and Lot 2 on Plan 29392, Postans.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the premises. As a result of this assessment, Revised Licence L8974/2016/2 has been granted.

The Revised Licence issued as a result of this amendment supersedes the Existing Licence previously granted in relation to the premises.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary

On 23 March 2021, the Licence Holder submitted an application to the department to amend Licence L8974/2016/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act).

This amendment is limited only to changes to Category 61A activities from the Existing Licence. No changes to the aspects of the Existing Licence relating to Category 67A were requested by the Licence Holder.

Table 1 below outlines the proposed changes to the Existing Licence.

Table 1: Proposed maximum throughput changes

Category	Description	Current maximum throughput capacity	Proposed maximum throughput capacity	Description of proposed amendment
61A	Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated or discharged onto land.	200,000 tonnes per annual period	500,000 tonnes per annual period	Reprocessing and treatment of up to 500,000 tonnes of solid wastes per annual period triggers Category 61A under Schedule 1 of the <i>Environmental Protection Regulations 1987</i> (EP Regulations) (more than 1,000 tonnes)

Category	Description	Current maximum throughput capacity	Proposed maximum throughput capacity	Description of proposed amendment
67A	Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.	50,000 tonnes per annual period	No change	No change

The following amendments are being sought to the proposed waste acceptance rates for Category 61A, as specified in condition 1 of the Existing Licence:

- acid sulfate soils (ASS) and potential acid sulfate soils (PASS) increasing from 100,000 tonnes per annual period to 300,000 tonnes per annual period;
- Class I contaminated soils increasing from 20,000 tonnes per annual period to 100,000 tonnes per annual period; and
- Class IV hydrocarbon and pesticide contaminated soils increasing from 1,000 tonnes per annual period to 20,000 tonnes per annual period.

As condition 1 in the Existing Licence does not specify the maximum waste acceptance rate for clean fill, the proposed increases in the Category 61A throughput would also result in an increase in the quantity of clean fill that could potentially be received at the premises each year.

The Licence Holder did not propose any changes to containment infrastructure (i.e. hardstands, basins and sumps) at the premises as they consider the existing infrastructure is adequate to accommodate the increased Category 61A throughput. The Licence Holder's application indicated their intention to bring some additional mobile equipment onto the premises to increase the daily processing capacity. This additional equipment comprises the following:

- one McCloskey 512 trommel;
- one McCloskey R155 screen;
- one Kleeman MS15Z screen;
- one Tesab TS1550 screen
- three Komatsu loaders; and
- one Edge FTS75 grizzly stacker.

The Existing Licence included two improvement conditions relating to the installation of two new groundwater monitoring bores at the premises. As the Licence Holder has now completed these works, the Delegated Officer has incorporated the removal of these conditions within the scope of this assessment.

The Delegated Officer has also taken the opportunity to make minor amendments to improve the clarity of some conditions as part this assessment. Further detail about amendments made as a result of this assessment is provided in Section 6.1.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020a).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	<p>Operation of processing and earthmoving equipment (trommels, screens, stackers, loaders, dozers, excavator)</p> <p>Vehicle movements</p> <p>Lift-off from stockpiles of wastes and/or products</p>	Air/ windborne pathway	<p>Existing dust suppression infrastructure comprising a reticulated irrigation system with manual and automated knocker sprinklers, sourcing water from two abstraction bores operating at 120,000 L/hour.</p> <p>A 15,000 L water truck is available for additional dust suppression as required.</p> <p>Stormwater from the bioremediation area stormwater basins is reused for irrigation onto contaminated soils stored within the bioremediation area.</p> <p>Dust controls on the Existing Licence, in addition to those discussed in the application and outlined above, are as follows:</p> <ul style="list-style-type: none"> • Stockpiles are limited to a height of 7 m above natural ground level (as defined in the Existing Licence) or less. • Detailed requirements for the specifications and operation of the reticulated sprinkler system. • Vehicle speed limit of 25 km/hr on unconsolidated or unsealed roads. • Activities are ceased if they cause visible dust lift-off where dust emissions are, or are likely to, impact on sensitive receptors.
Noise	<p>Operation of processing and earthmoving equipment (trommels, screens, stackers, loaders, dozers, excavator)</p> <p>Vehicle movements</p>	Air/ windborne pathway	Site operations restricted to between 6am to 6pm Monday to Saturday.

Emission	Sources	Potential pathways	Proposed controls
Contaminated stormwater	Storage and treatment of ASS/PASS and contaminated soils	Seepage to soils and groundwater	<p>Clean fill and Class I soils:</p> <p>No controls proposed.</p> <p>ASS/PASS:</p> <p>ASS/PASS to be stored on the existing treatment pad draining to sumps (refer to Section 3.3.2 for further information).</p> <p>ASS/PASS is treated immediately upon receipt and validated in accordance with the Licence Holder's <i>Acid Sulfate Soils Management Plan</i> (Eclipse Soils 2021a) and <i>Treatment and management of soils and water in acid sulfate soil landscapes</i> (Department of Environment and Conservation (DEC) 2011) (note this guideline was superseded by <i>Treatment and management of soils and water in acid sulfate soil landscapes</i> (ASS Treatment Guideline), published by the Department of Environment Regulation in 2015 (DER 2015b)).</p> <p>ASS/PASS with metals exceeding ecological investigation levels (EILs) are immediately remediated and validated to meet EILs.</p> <p>All soils are tested and validated to meet remediation criteria following remediation, before being removed off the treatment pads.</p> <p>Minimal water applied to stockpiled ASS/PASS for dust suppression purposes.</p> <p>Class IV hydrocarbon and pesticide contaminated soils:</p> <p>Contaminated soils to be stored on the existing lined bioremediation area pad that drains to two lined stormwater basins (refer to Section 3.3.2 for further information).</p> <p>Stormwater from the bioremediation area basins is reused back onto soil stockpiles within the bioremediation area. No increase in external irrigation water will be required to treat the proposed quantities of contaminated soils.</p> <p>All soils are tested and validated to meet remediation criteria following remediation, before being removed off the treatment pads.</p>

Emission	Sources	Potential pathways	Proposed controls
Odour	Storage and treatment of contaminated soils	Air/ windborne pathway	<p>Hydrocarbon odour levels for Class IV contaminated soils are assessed by the Quality Control Manager and Site Manager upon receipt and if there is a perceived risk of odour leaving the premises boundary, the stockpile will be covered with a layer of sand following the addition of water, organics and nutrients. The stockpile would be reassessed throughout the bioremediation process and kept covered until further testing by the two Managers confirms that odours have sufficiently decreased.</p> <p>Odours caused by anaerobic decomposition within stockpiles of Class IV hydrocarbon and pesticide contaminated soils are monitored and if ammonia is detected, the stockpile will be turned to reinstate aerobic conditions.</p>

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020a), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020b)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential areas of Medina and Orelia	Nearest residential area is approximately 730 m south of the premises boundary. No residential receptors were identified down hydraulic gradient of the premises.
Recreational receptors	There is an area zoned for parks, recreation and drainage located about 780 m west of the premises boundary. Visitors to the Spectacles wetlands about 1.2 km east of the premises boundary. Visitors to the Perth Motorplex about 1.4 km west of the premises boundary.
Industrial receptors	The premises is surrounded by the Alcoa Kwinana Alumina Refinery to the east and north, the Kwinana Wastewater Treatment Plant further east and WA Limestone to the west. The Latitude 32 industrial area is located 200 m north-west of the premises boundary. There are a number of industrial receptors located down hydraulic gradient of the premises in Postans, Kwinana Beach, Naval Base and the Latitude 32 industrial area.
Agricultural research station	The Department of Primary Industries and Regional Development's Medina agricultural research station is located directly south of the premises. The Licence Holder has indicated that the former caretaker's residence on this property is unoccupied and was recently destroyed by fire.
Environmental receptors	Distance from prescribed activity
Groundwater	Based on monitoring undertaken at the premises, the depth to the water table of the superficial aquifer ranges from about 13.5 m below ground level (BGL) at ARMB5 to 23 m BGL at ARMB8. The depth of the water table below ground level is shallower (about 3.5 to 4 m BGL) in previously excavated quarry voids on the premises. The surface geology and superficial aquifer at the premises are within the Tamala Limestone formation. Based on the Perth Groundwater Map, the regional groundwater flow direction is west north-west, towards Cockburn Sound. Aurora Environmental (2021) report that relative groundwater levels measured during quarterly monitoring indicate a local groundwater flow direction to

	<p>the west south-west. There are two abstraction bores operated by the Licence Holder within the premises boundary and additional abstraction bores on the lots surrounding the premises. Groundwater flow at the premises may be locally affected by drawdown from on- and off-site abstraction bores.</p> <p>The Delegated Officer considers that the regional groundwater flow direction to the west north-west is the most reliable representation of potential contaminant transport pathways from the premises. However, the localized influences from groundwater abstraction also require consideration when interpreting groundwater monitoring data and inferring potential contaminant transport pathways.</p> <p>The premises is within the Cockburn Groundwater Area which is a proclaimed area under the <i>Rights in Water Irrigation Act 1914</i>.</p> <p>Groundwater in the superficial aquifer below the premises is fresh to brackish. The main beneficial use of groundwater in the superficial aquifer in the vicinity and down hydraulic gradient of the premises is likely to be non-potable use for irrigation, dust suppression and industrial purposes. More than ten groundwater licences have been granted at sites down hydraulic gradient of the premises. Shallow groundwater may also support groundwater dependent ecosystems of the Swan Coastal Plain including wetlands (see below) and groundwater dependent vegetation such as shrubland scrub heath and tuart woodlands.</p>
Geomorphic Wetlands of the Swan Coastal Plain	<p>The following wetlands were identified as potentially down or cross hydraulic gradient of the premises:</p> <ul style="list-style-type: none"> - Unnamed resource enhancement basin dampland – 1.8 km north-west - Unnamed resource enhancement basin dampland – 780 m north north-west - Unnamed multiple use basin dampland – 880 m north north-west - Long Swamp, conservation basin sumpland – 1.3 km north - Unnamed resource enhancement basin sumpland – 2.9 km north-west
Surface water	No hydrological features were identified directly down hydraulic gradient of the premises.
State Environment Policy Cockburn Sound Policy Boundary	The premises is within this area and is located about 3.4 km from the Cockburn Sound coastline.
Environmental Protection Policy areas	The premises is located on the boundary of Areas B and C of the <i>Environmental Protection (Kwinana) (Atmospheric Wastes) Policy Area</i> .
Threatened and Priority Ecological Communities	<p>The premises is within the 500 m buffer area for the following communities:</p> <ul style="list-style-type: none"> - Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain, mapped within and surrounding the premises boundary. - <i>Melaleuca huegelii</i> – <i>Melaleuca systema</i> shrublands on limestone ridges. - Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region.

<p>Department of Biodiversity, Conservation and Attractions legislated tenure, Regional Parks and Bush Forever</p>	<p>Beeliar Regional Park including the Spectacles wetlands about 1.2 km east of the premises.</p>
<p>Threatened fauna</p>	<p>One Priority 4 species (Quenda), one Priority 3 species (Perth slider) and one endangered species (Carnaby's cockatoo) were identified within about 1 km of the premises.</p>

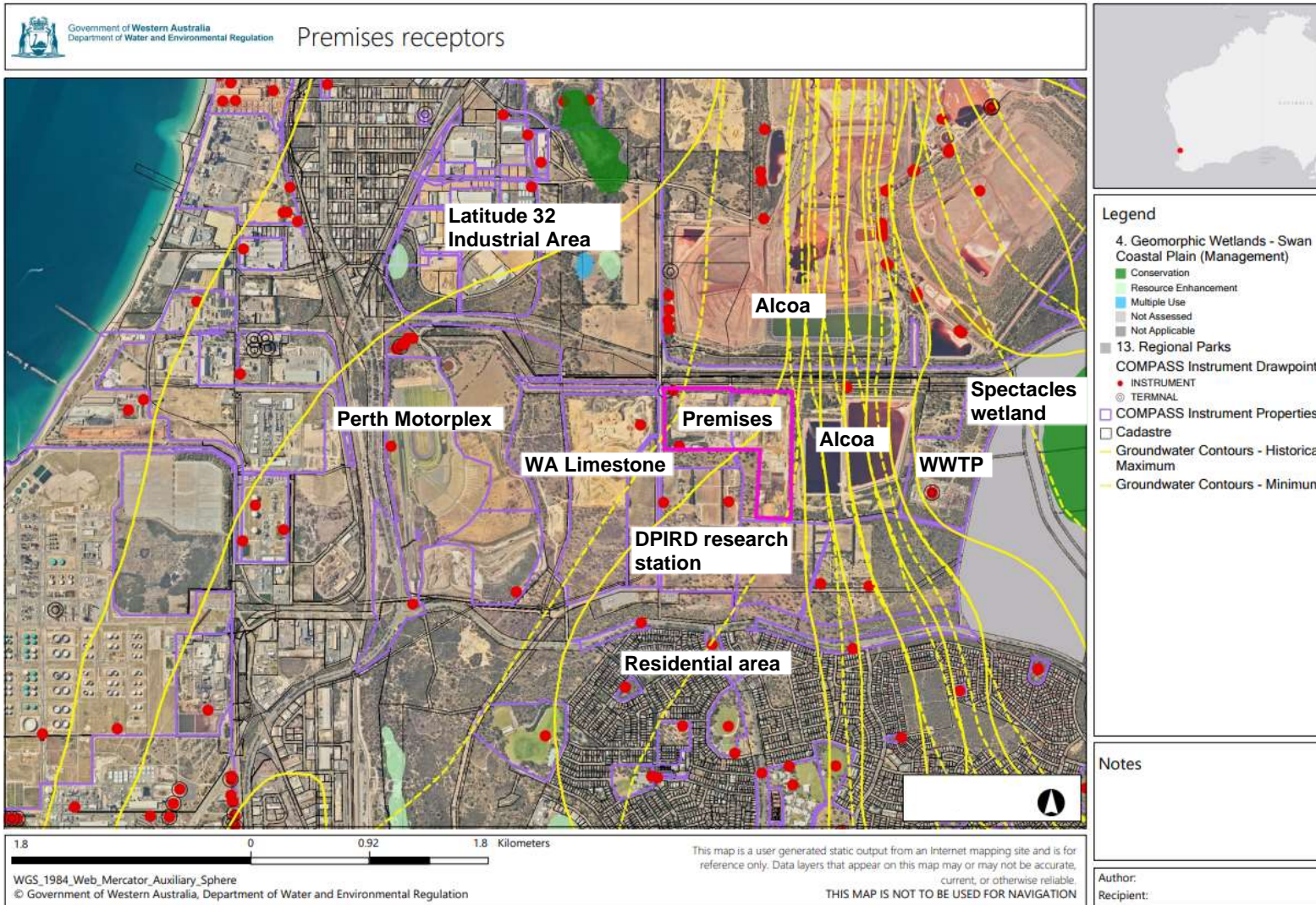


Figure 1: Distance to sensitive receptors

The premises boundary is shown by the pink line. Purple lines show sites with groundwater licences, red dots show groundwater licence drawpoints and yellow lines show the historical maximum (solid) and minimum (dashed) superficial aquifer groundwater contours from the Perth Groundwater Map. Threatened ecological communities and fauna are not shown.

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3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The Revised Licence L8974/2016/2 that accompanies this Amendment Report authorises emissions associated with the operation of the premises i.e. storage, reprocessing and treatment of solid wastes.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015a).

Table 4: Risk assessment of potential emissions and discharges from the premises during operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient ?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
<p>Operation of processing and earthmoving equipment (trommels, screens, stackers, loaders, dozers, excavator)</p> <p>Vehicle movements</p> <p>Lift-off from stockpiles of waste and/or products</p>	Dust	<p>Air/windborne pathway causing impacts to health and amenity</p> <p>Adverse impacts to natural ecosystems</p>	<p>Medina and Orelia residential areas 730 m south of the premises</p> <p>Workers at surrounding industrial premises and agricultural research station</p> <p>Visitors to recreational areas 780 m to 1.4 km west, and 1.2 km east of the premises</p> <p>Beeliar Regional Park and Spectacles wetlands 1.2 km east</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Possible</p> <p>Medium Risk</p>	N	<p>Conditions 1, 6 and 8</p> <p>Condition 7</p>	<p>The Licence Holder's proposed controls in combination with the reticulated dust suppression system, speed limits and dust response measures conditioned in the Existing Licence are generally suitable.</p> <p>Condition 4 on the Existing Licence limits the height of stockpiles to 7 m above natural ground level. Natural ground level is defined as the level of the top of embankments around an area in the north-east of the premises. When this stockpile height condition was originally specified on the licence in 2017, there were multiple quarry voids in the east of the premises that were over 10 m deep. The maximum stockpile height was specified in relation to natural ground level to allow stockpiles higher than 7 m within these quarry voids. However, filling since 2016 has reduced the quarry void space and the remaining voids are now substantially shallower. The deepest quarry void currently used for stockpiling is the 'main screening area' (Figure 2 in the licence) where asbestos and ACM contaminated soils are stored and remediated.</p> <p>The Delegated Officer considers that the height of stockpiles in the west and south of the premises should be limited to 7 m above the base of the stockpile, rather than 7 m above natural ground levels from the north-east of the premises. This control will be simpler to implement and enforce. The Delegated Officer considers that greater stockpile heights can be allowed in the quarry voids that remain in the north-east of the premises, up to 30 m Australian Height Datum (AHD) in the main screening area and 35 m AHD in the surrounding area termed the 'north-eastern stockpiling area'. These maximum stockpile heights are specified relative to a height datum (mAHD) so that a consistent regulatory control can be maintained over time, even if the elevation of the ground surface changes again in the future.</p> <p>The Delegated Officer determined to expand the existing infrastructure and equipment table to ensure it clearly conveyed the equipment authorised to be used at the premises. These changes are summarised as follows:</p> <ul style="list-style-type: none"> • Add all types of mobile equipment and related operational requirements. Based on the risk assessment, the Delegated Officer considered that it was not necessary to specify the make and model or operating location of equipment. No limits were placed on the numbers of screens, trommels, stackers, loaders, excavators, bobcats, telehandlers, tractors, dozers and rollers that can be present onsite as this was not considered necessary to mitigate dust emissions from the premises. • Add the requirement for a water truck with a capacity of at least 15,000 L to be present onsite to provide supplementary dust suppression capability, in addition to the reticulated sprinkler system.
<p>Operation of processing and earthmoving equipment (trommels, screens, stackers, loaders, dozers, excavator)</p> <p>Vehicle movements</p>	Noise	<p>Air/windborne pathway causing impacts to health and amenity</p>	<p>Medina and Orelia residential areas 730 m south of the premises</p> <p>Workers at surrounding industrial premises and agricultural research station</p> <p>Visitors to recreational areas 780 m to 1.4 km west, and 1.2 km east of the premises</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Unlikely</p> <p>Medium Risk</p>	N	<p>Condition 6</p>	<p>The Delegated Officer determined to include an operational requirement that mobile equipment is maintained in good working order to mitigate the risk of elevated noise emissions from faulty equipment. Based on the risk assessment, the Delegated Officer considered that no other additional regulatory controls are required and it is not necessary to specify the make and model, operating location or maximum number of mobile equipment onsite.</p> <p>Based on the proposed scope of activities, current environmental siting and distance to receptors, the Delegated Officer considers that a noise monitoring assessment is not required to verify that noise emissions from the premises comply with the relevant assigned noise levels in the <i>Environmental Protection (Noise) Regulations 1997</i>. However, if surrounding land uses change and the separation distances to receptors decrease, the Licence Holder may need to commission a noise verification assessment to confirm compliance with the relevant assigned noise levels.</p> <p>Noise verification assessments at prescribed premises should capture the maximum potential noise impacts from the prescribed and directly related activities. At the premises this would mean</p>

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient ?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
								conducting a noise verification assessment once the proposed throughput has ramped up and at a time when all equipment is in use. Based on the current premises operating hours, a noise verification assessment would need to consider assigned levels applicable during both daytime (0700 to 1900 hours) and night time (2200 to 0700 hours) on Monday to Saturday.
Storage and treatment of ASS/PASS and contaminated soils	Contaminated stormwater	Seepage to soils and groundwater and migration down hydraulic gradient Deterioration of groundwater quality	Non-potable groundwater users down hydraulic gradient Groundwater dependent ecosystems down hydraulic gradient	Refer to Section 3.1	Refer to Section 3.3	N	Conditions 1 and 20 Condition 3 and 5	Refer to Section 3.3
Storage and treatment of contaminated soils	Odour	Air/windborne pathway causing impacts to health and amenity	Medina and Orelia residential areas 730 m south of the premises Workers at surrounding industrial premises and agricultural research station Visitors to recreational areas 780 m to 1.4 km west, and 1.2 km east of the premises	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	None	The Licence Holder's proposed controls are adequate but do not need to be included as regulatory controls in the licence due to the low risk rating for this emission.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments (DWER 2020a)*.

Note 2: Proposed Licence Holder's controls are depicted by standard text. **bold and underline text** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment for contaminated stormwater

3.3.1 Description of risk event

Contaminated stormwater may be generated through interaction of stormwater with ASS/PASS or contaminated soils on the premises. The Licence Holder proposes to increase the quantities of ASS/PASS, Class I contaminated soils and Class IV hydrocarbon and pesticide contaminated soils stored and processed at the premises.

If the areas where these materials are stored and processed do not adequately capture and retain stormwater, or are not constructed to achieve a sufficiently low permeability, contaminated stormwater may seep into soil and migrate through the unsaturated zone to the superficial aquifer.

Contaminants associated with ASS/PASS, Class I contaminated soils and Class IV hydrocarbon and pesticide contaminated soils may degrade groundwater quality and have the potential to impact down gradient groundwater users and groundwater dependent ecosystems.

3.3.2 Identification and general characterization of emission

Contaminated stormwater is generated when contaminants from stockpiled wastes leach into stormwater during and following rainfall. Water applied to stockpiled wastes for dust suppression can also contribute to contaminated stormwater generation.

Stormwater associated with ASS/PASS storage has the potential to be acidic and contain elevated concentrations of sulfate. The interaction of acidic stormwater with stockpiled soils has the potential to mobilise metals such as arsenic, aluminium and iron. Treatment of ASS/PASS is undertaken at the premises using aglime, limestone or lime sand which would have a neutralising effect on soils and stormwater in treatment areas.

Class I contaminated soils are defined in the *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)* (Landfill Definitions; DWER 2019a). Class I contaminated soils could potentially contain a broad range of contaminants such as metals, cyanide, fluoride, petroleum hydrocarbons, benzene, toluene, ethylbenzene and xylenes (BTEX), polychlorinated biphenyls (PCBs) and pesticides. The relatively low concentrations and leachability of contaminants in Class I soils means they have a lower likelihood of leaching contaminants into stormwater than other contaminated soils handled at the premises.

Class IV contaminated soils are defined in the Landfill Definitions. Based on the Existing Licence, the contaminants associated with Class IV contaminated soils authorised for acceptance at the premises are hydrocarbons and the following pesticide compounds: 2,4-dichlorophenoxyacetic acid, 2,4,5-trichlorophenoxyacetic acid, aldrin, chlordane, DDT, dieldrin, lindane and metolachlor. The high concentrations and/or leachability of contaminants in Class IV contaminated soils means they have a higher likelihood of leaching contaminants into stormwater than other contaminated soils at the premises. The Licence Holder adds nutrients and other substances to Class IV contaminated soils to facilitate bioremediation processes and these additives may also affect stormwater quality in the bioremediation area.

The current containment infrastructure controls for areas used to store and process ASS/PASS, Class I contaminated soils and Class IV hydrocarbon and pesticide contaminated soils are set out in Table 5. The Licence Holder's application indicates that the existing storage areas at the premises are large enough to accommodate the proposed increased throughputs and are in good condition with no outstanding maintenance. Once ASS/PASS and Class IV contaminated soils have been treated, tested and validated to meet remediation criteria, they are relocated off containment infrastructure to other parts of the premises.

Table 5: Specifications of existing waste storage and processing areas

Material	Designated area(s)	Hardstand/pad specifications	Stormwater basin/sump specifications
ASS/PASS	ASS/PASS area Green waste area	Pad comprising minimum thickness of 300 mm compacted limestone surrounded by a 150-300 mm high bund – permeability of the pad is unknown. About 10.5 ha combined area across the ASS/PASS and green waste areas	ASS/PASS area¹: Two sumps lined with clay overlying a compacted limestone base Storage capacity unknown Green waste area: Basin constructed with a minimum thickness of 300 mm compacted limestone A minimum 300 mm embankment freeboard must be maintained on the stormwater basin Storage capacity unknown
Class I contaminated soils	No designated area	No designated hardstand/pad Application indicates a storage area about 21 ha in size	No designated stormwater storage
Class IV hydrocarbon and pesticide contaminated soils	Bioremediation area	Compacted crushed limestone pad overlain by 1.50mm high-density polyethylene (HDPE) liner, 150 mm screened sand and 150 mm crushed limestone laid to a 1% fall ² About 1 ha in size	Two basins lined by a 1.50 mm HDPE liner A minimum 300mm embankment freeboard must be maintained on the stormwater basins Storage capacity of each basin is 425 m ³ , sized to accommodate about five 1 in 5 year storm events, each lasting for 20 mins at 50 mm/hour

Note 1: There are no containment infrastructure requirements specified for the ASS/PASS area sumps in the Existing Licence.

Note 2: The specifications of the bioremediation area pad and basins are based on specifications assessed under works approval W4424/2008/1 and related construction compliance documentation from when the bioremediation area was constructed in 2009. After reviewing this documentation, the Delegated Officer has identified that the bioremediation area specifications in condition 6 of the Existing Licence do not accurately reflect how the hardstand and basin liners were installed.

The Licence Holder considers that there will be no net changes to the stormwater volumes at the premises as a result of the proposed throughput changes. This is because stormwater volumes are predominantly influenced by the catchment area of containment infrastructure which will not change.

The Licence Holder has indicated that dust suppression water volumes applied to ASS/PASS are minimal, only used to wet the surface of stockpiles and are mostly lost through evaporation. It is assumed that dust suppression water is applied to Class I contaminated soils in a similar manner. Dust suppression of Class IV contaminated soils is achieved through recycling water from the basins in the bioremediation area and the Licence Holder has indicated that no additional inputs will be required with the proposed throughput increase.

The storage capacity of the stormwater basins in the bioremediation area is based on holding the stormwater runoff from the pad from five consecutive 1 in 5 year 20 minute rainfall events which equates to about 83 mm. The department's currently regulatory approach would

generally be for contaminated stormwater basins to have sufficient capacity to hold the rainfall from a 5% annual exceedance probability (AEP) 24-hour rainfall event. This equates to about 103 mm of rainfall based on the Bureau of Meteorology (BOM) Design Rainfall Data System and is a more severe rainfall event than the bioremediation area stormwater basins were designed to accommodate. Historical aerial photography and a compliance inspection at the premises in January 2018 indicate that stormwater intermittently overtops the bioremediation area stormwater basins and pools onto the adjacent hardstand pads.

Based on the considerations discussed above, emissions of contaminated stormwater affected by ASS/PASS, Class I contaminated soils or Class IV contaminated soils could occur by the following mechanisms:

- **ASS/PASS:** Infiltration of stormwater through the compacted limestone pads and sumps of the ASS/PASS area and green waste area. These pads and sumps are unlikely to provide an impermeable barrier to stormwater to infiltration.
- **Class I contaminated soils:** Class I contaminated soils are not stored on containment infrastructure designed to capture and retain stormwater. Infiltration of stormwater that has interacted with Class I contaminated soils could therefore occur wherever these soils are stored.
- **Class IV contaminated soils:** Infiltration of contaminated stormwater from the bioremediation area could potentially occur through leaks in the HDPE liner comprising the pads and basins or via overtopping of the basins or pad bunding. Leaks in the HDPE liner could occur due to deterioration of the liner condition or damage such as tears or punctures. The bioremediation area pad and basins were constructed in 2009 and the current condition of the HDPE liner and protective layers over the pad are unknown.

3.3.3 Description of potential adverse impact from the emission

Infiltration of contaminated stormwater has the potential to degrade soil and groundwater quality of the superficial aquifer. Soil beneath the premises may become impacted through the accumulation of contaminants such as hydrocarbons and pesticides in the unsaturated zone. Contaminants which are transported to the superficial aquifer may impact the beneficial use of groundwater for non-potable purposes down hydraulic gradient from the premises. There is the potential for some contaminants to undergo natural attenuation within the superficial aquifer as groundwater flows down hydraulic gradient.

The Existing Licence requires that all ASS/PASS must be treated on the day of delivery or otherwise stored in accordance with the procedures outlined in section 2.8 of the ASS Treatment Guideline (DER 2015b). Although contaminated stormwater from ASS/PASS is likely to be acidic, the neutralisation of soils with alkaline materials soon after they are accepted at the premises should ensure that any acid generated is effectively neutralised. Additionally, the buffering capacity of the limestone pad and natural limestone soils underlying the premises are likely to mitigate the potentially low pH of impacted stormwater before it enters the superficial aquifer.

The eventual fate of shallow groundwater migrating from the premises is likely to be discharge to the Cockburn Sound marine environment about 3.4 km to the west, recharge to a deeper aquifer or extraction from one of the licensed groundwater production bores between the premises and the coast. Shallow groundwater may also be taken up by groundwater dependent vegetation or discharged to wetlands down hydraulic gradient from the premises.

Wetlands have been screened out of the risk assessment because they are either not likely to be directly down hydraulic gradient from the premises or are more than 1.5 km from the premises. Cockburn Sound has been screened out of the risk assessment because it is 3.4 km from the premises and the potential contaminant loading resulting from contaminated stormwater infiltration at the premises is considered minor compared to other nearby sources.

Groundwater data review

As part of the previous licence amendment assessment dated 21 December 2020, the department completed a review of quarterly groundwater monitoring data collected from the premises between 2018 and 2020 (DWER 2021a). This review identified some spatial trends in groundwater quality which could potentially be related to activities at the premises, but also highlighted some uncertainties that limited the department's interpretation of monitoring results.

The Licence Holder installed two new groundwater monitoring bores during 2021, comprising ARMB7 (alternative to monitoring bore ARMB2) and ARMB8 (new location down hydraulic gradient of the green waste area) (Figure 2). The 2020-2021 Annual Environmental Report (AER) submitted to the department reported on two quarterly monitoring events (July and October 2020) of the previous monitoring network and the first six-monthly monitoring event (April/May 2021) of the revised monitoring network (Aurora Environmental 2021).

To inform the risk assessment for potential contaminated stormwater emissions, the department conducted an updated groundwater data review which considers the recent monitoring results reported in the 2020-2021 AER (Aurora Environmental 2021). The findings of this review are summarized under the following sub-headings.

General water quality and nutrients

- Groundwater at the premises is generally fresh to brackish (429-1,203 mg/L total dissolved solids), of neutral pH (6.81-7.98) and ranges from negative to positive redox potential with variable dissolved oxygen content (0.14-7.12 mg/L). During the 2020-2021 annual period, the highest salinities were recorded at ARMB6A and ARMB7 and the lowest redox potentials were recorded at ARMB7 and ARMB8.
- Alkalinity in groundwater is consistently above 80 mg/L CaCO₃ in all monitoring bores. The ASS Treatment Guideline indicates that this high level of alkalinity generally provides an adequate buffering capacity to maintain an acceptable pH in the future (DER 2015b).
- Major ion analysis was included in the April/May 2021 monitoring event analysis. Based on the results from this event, the ionic composition of groundwater at ARMB5, ARMB6A, ARMB7 and ARMB8 showed a higher sulfate content relative to other major ions, compared to background bore ARMB1. ARMB6A recorded the highest sulfate concentrations (160-180 mg/L) during the 2020-2021 annual period and these were below the Non-Potable Use Guideline (NPUG) value of 1000 mg/L.
- Elevated concentrations of nitrogen (total nitrogen, total oxidised nitrogen and/or ammonia) were recorded at ARMB5, ARMB6A, ARMB7 and ARMB8 compared to the background bore ARMB1. ARMB7 and ARMB8 recorded the highest total nitrogen concentrations (18-32 mg/L) during the 2020-2021 annual period.
- Ammonia was the dominant form of nitrogen detected at ARMB6A and ARMB7. ARMB7 recorded the highest ammonia concentration (NH₃-N 18 mg/L) during the 2020-2021 annual period. Some concentrations of ammonia detected at ARMB1, ARMB6A and ARMB7 during the 2020-2021 annual period exceeded the NPUG for NH₃-N of 0.4 mg/L. This NPUG value is based on an aesthetic drinking water quality guideline set to avoid corrosion of copper pipes and is not a human health risk-based assessment level.
- Nitrate was the dominant form of nitrogen detected at ARMB5 and ARMB8. ARMB8 recorded the highest nitrate concentration (NO₃-N of 32 mg/L) during the 2020-2021 annual period. Recorded concentrations of nitrate and total oxidized nitrogen during the 2020-2021 annual period were below the NPUG value for NO₃-N of 113 mg/L.
- Nitrite was the dominant form of nitrogen detected at background monitoring bore

ARMB1. The detected concentration of 1.7 mg/L NO₂-N was below the NPUG value of 9.13 mg/L.

- Biochemical oxygen demand (BOD) was included in the April/May 2021 monitoring event analysis. BOD was not detected above the limit of reporting (LOR) at any of the bores sampled during this monitoring event.

Metals

- Elevated concentrations of arsenic were recorded at ARMB6A and ARMB7 compared to the background bore ARMB1. ARMB7 recorded the highest arsenic concentration (0.067 mg/L) during the 2020-2021 annual period. Arsenic concentrations at ARMB6A appear to be recording an increasing trend but remain within the historical range of concentrations at this bore. Recorded concentrations of arsenic during the 2020-2021 annual period were below the NPUG value of 0.1 mg/L.
- Elevated concentrations of iron were recorded at ARMB2 and ARMB6A compared to the background bore ARMB1. ARMB6A recorded the highest iron concentrations (4.7-5.6 mg/L) during the 2020-2021 annual period and appear to be recording an increasing trend. Concentrations of iron detected at ARMB2 and ARMB6A during the 2020-2021 annual period exceeded the NPUG value of 0.3 mg/L. This NPUG value is based on an aesthetic drinking water quality guideline set to avoid iron precipitation and is not a human health risk-based assessment level.
- An elevated concentration of manganese was recorded at ARMB7 (1.2 mg/L) compared to the background bore ARMB1, and was the highest concentration that has been reported at the premises since at least 2012. Recorded concentrations of manganese during the 2020-2021 annual period were below the NPUG value of 5 mg/L.
- No significant spatial trends were observed in concentrations of aluminium, chromium, copper, cadmium, lead, mercury, nickel, selenium and zinc. Concentrations of these metals did not exceed the relevant NPUG values.

Organic compounds

- The total recoverable hydrocarbon (TRH) fraction TRH >C₁₆-C₃₄ F3 was detected at a concentration of 0.2 mg/L at ARMB7 during the April/May 2021 monitoring event. This was the first detection of TRH or total petroleum hydrocarbons (TPH) in groundwater at the premises since at least 2012.
- Dieldrin was detected at a concentration of 0.002 µg/L at ARMB6A during one monitoring event during the 2020-2021 annual period. This result is consistent with previous sporadic detections of dieldrin at low concentrations near the LOR at this monitoring bore. The recorded concentration of dieldrin was below the NPUG value of 0.003 mg/L. Other organochlorine and organophosphate pesticides were not detected above the LOR during the 2020-2021 annual period.
- BTEX, PCBs and polycyclic aromatic hydrocarbons (PAHs) were not detected above the LOR during the 2020-2021 annual period. This is consistent with previous monitoring results from the premises.



Figure 2: Groundwater monitoring network sampled during 2020-2021 annual period
Monitoring bores in the revised monitoring network are shown by the blue dots and the monitoring bore removed from the monitoring network as a result of the December 2020 licence amendment is shown by the red dot.

3.3.4 Criteria for assessment

Based on the environmental siting, relevant groundwater assessment criteria are the Non-Potable Use Guidelines (Department of Health 2014) as outlined in the *Guideline: Assessment and management of contaminated sites* (DWER 2021b). These criteria are relevant to assessing potential amenity and human health risks from non-potable uses of groundwater.

3.3.5 Key findings

The Delegated Officer has reviewed the information regarding contaminated stormwater emissions and has found:

1. The proposed increases to the quantity of ASS/PASS, Class I contaminated soils and Class IV contaminated soils are not expected to significantly affect the quantity of stormwater captured and managed at the premises. However, the increased quantities are expected to increase the likelihood that stormwater will be impacted by contaminants associated with these wastes.
2. There is uncertainty about the current integrity of the HDPE liner in the bioremediation area pad and basins and this will be considered in the risk assessment.
3. The stormwater basins in the bioremediation area were designed and installed to hold the runoff from a less severe rainfall event than the department would generally require when approving new containment infrastructure. The potential for these basins to overtop outside of the HDPE lined area will be considered in the risk assessment.

4. The hardstand pads and sumps of the ASS/PASS area and green waste area are unlikely to be sufficiently impermeable to prevent infiltration. Stormwater affected by ASS/PASS stored and treated in these areas is therefore likely to infiltrate to soil and groundwater. The crushed limestone used to form this infrastructure and natural limestone soils underlying the premises are likely to have a neutralising effect on infiltrating stormwater.
5. The specifications of the ASS/PASS area and green waste area pads meet the requirements for a treatment pad and guard layer for short-term storage (up to 2.5 days) of ASS/PASS, as outlined in the ASS Treatment Guideline (DER 2015b). Additional controls would be required to mitigate the risks from medium-term (up to four weeks) and long-term (more than four weeks) storage of ASS/PASS before treatment. These additional controls are set out in Section 2.8 of the ASS Treatment Guideline and include measures such as the installation of leachate collection and treatment systems and capping or lining stockpiles to reduce exposure to oxygen.
6. The main receptors of significance to groundwater contamination which migrates down hydraulic gradient of the premises are groundwater users. Groundwater in this area is used for non-potable purposes including irrigation, dust suppression and industrial processes.
7. Groundwater quality at bores inferred to be down hydraulic gradient of the premises shows changes compared to the background bore on the eastern boundary. The observed changes could be a result of activities on the premises, including but not limited to storage and treatment of ASS/PASS, Class I contaminated soils and Class IV contaminated soils. However, due to several sources of uncertainty it is not possible to determine the source of the observed changes.
8. Concentrations of potential contaminants in groundwater generally comply with the NPUG values which are relevant to assessing the suitability of groundwater for non-potable uses. Concentrations of ammonia and iron exceed the NPUG values in some groundwater bores that are potentially down hydraulic gradient from the premises. These specific guideline values are based on aesthetic drinking water quality guidelines relating to pipe corrosion and iron staining. They are therefore most relevant to assessing potential amenity impacts rather than human health risks from using groundwater for non-potable purposes down hydraulic gradient from the premises.
9. The groundwater monitoring network is considered suitable to assess groundwater quality up hydraulic gradient of the premises and down hydraulic gradient of the ASS/PASS area and green waste area. It is not known if monitoring bores ARMB6A and ARMB7 are appropriately sited to assess groundwater quality down hydraulic gradient from the bioremediation area as there remains uncertainty about local groundwater flow direction at the premises.

3.3.6 Consequence

If infiltration of contaminated stormwater occurs at the premises, then the Delegated Officer has determined that the relevant consequence criteria (for amenity and public health) for groundwater of the Non-Potable Use Guidelines (NPUG) are likely to be met. Therefore, the Delegated Officer considers the consequence of contaminated stormwater infiltration to be **minor**.

3.3.7 Likelihood

The Delegated Officer has determined that contaminants associated with ASS/PASS, Class I contaminated soils and Class IV contaminated soils could migrate to groundwater via contaminated stormwater infiltration at some time. Therefore, the Delegated Officer considers the likelihood of this Risk Event to be **possible**.

3.3.8 Overall risk rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix in the *Guidance Statement: Risk Assessments* and determined that the overall rating for the risk of this Risk Event is **medium**.

3.3.9 Justification for additional regulatory controls

The waste processing conditions in the licence need to explicitly require that ASS/PASS and Class IV contaminated soils are tested and validated against treatment criteria before being moved off containment infrastructure. This will ensure that wastes have been appropriately treated before being moved to uncontained portions of the premises for subsequent storage or blending.

Section 2.8 of the ASS Treatment Guideline sets out the short-term, medium-term and long-term stockpiling requirements for ASS/PASS before treatment by neutralisation. The Licence Holder has indicated that they treat ASS/PASS immediately upon receipt, which is consistent with the short-term stockpiling timeframes (up to 2.5 days depending on soil type) set out in the ASS Treatment Guideline. To help mitigate the potential risks from the proposed increased quantities of ASS/PASS to be received at the premises, the conditions in the licence need to specify that medium-term and long-term stockpiling before treatment are not permitted.

The stormwater basins on the bioremediation area have a smaller storage capacity than the department would typically require and there have been previous instances of these basins overflowing onto the adjacent HDPE-lined pads. The Delegated Officer considers that the existing minimum freeboard requirement should be measured from the height of the lowest embankment, between the basin and adjacent HDPE-lined pad. Stormwater should not be allowed to overtop the basins and pool on the bioremediation pads because this increases the potential for contaminants to leach into stormwater and be released from containment infrastructure.

The total volume of Class III and IV contaminated soils proposed to be accepted and processed on the bioremediation area is 70,000 tonnes per year and the Licence Holder has indicated that this infrastructure has a total storage capacity of about 60,000 tonnes of soils at one time. The bioremediation area is about 10,000 m² in size and bioremediation of Class III and IV contaminated soils can require an extended period of time (i.e. six months or more). Based on these considerations, the Delegated Officer has determined that it is necessary to stipulate the maximum volume (40,000 m³) of Class III and IV soils that are untreated or undergoing treatment that can be stored at the premises at one time. This will ensure the premises does not accept more Class III and IV contaminated soils than can be effectively contained within the bioremediation area at one time.

The Delegated Officer considers that it is not necessary to stipulate maximum storage volumes for ASS/PASS and Class I contaminated soils at the premises at one time. This is because the proposed annual acceptance rates for these materials are substantially less than the available storage capacity and the treatment of these materials can be undertaken over a relatively short timeframe (i.e. on the order of one day).

The Existing Licence includes specifications for containment infrastructure on the premises but does not include any specifications for the stormwater basins associated with the ASS/PASS area. The Delegated Officer considers that inclusion of specifications for these basins in the containment infrastructure table is required to address this gap.

Although there is some uncertainty about whether monitoring bores ARMB6A and ARMB7 are down or cross hydraulic gradient from the bioremediation area, the Delegated Officer considers that the existing groundwater monitoring network is adequate. The department will review the adequacy of the monitoring network, including in the vicinity of the bioremediation area, in the future based on the findings of ongoing monitoring and in the context of other potential changes at the premises.

4. Other regulatory considerations

4.1 Recycling of waste materials

The Licence Holder recycles wastes to produce clean structural fill and blended water retentive soils at the premises. These recycled products are generated by blending a range of ingredients, including treated or bioremediated contaminated soils, ASS/PASS and composted green waste. The term 'blended water retentive soils' is used by the Licence Holder to capture a range of products including soil improver, soil conditioner, mulch and other specialised blended soil products.

As the Licence Holder proposes to significantly increase the quantities of ASS/PASS, Class I contaminated soils and Class IV contaminated soils received for treatment and recycling at the premises, the Delegated Officer has determined to review the current controls on recycled product quality within the scope of the assessment.

The department's *Factsheet – Assessing whether material is waste* (DWER 2018) sets out key factors that should be considered when determining whether outputs from a waste recycling facility are a waste or not. It is the waste recycling facility occupier's responsibility to make this determination. Waste recycling facility occupiers who consider that their product has ceased to be waste should satisfy themselves that they have sufficient recorded evidence to document and support this determination.

If a waste recycling facility output has not been substantially transformed or does not meet a suitable end use standard, it may still be considered a waste and needs to be managed as part of the regulatory framework for waste. Additional regulatory controls may apply to the transportation, storage and final use or disposal of outputs classified as wastes. This may include potential waste levy liability and tracking requirements for wastes accepted at other premises for disposal or reuse.

The *Waste Avoidance and Resource Recovery Levy Regulations 2008* (WARR Levy Regulations) provide for a levy to be payable in respect of "waste disposed of to landfill" which includes waste that is buried and used as fill.

4.2 End use standards for recycled products

Substantial transformation is a key factor in assessing whether material has ceased to be a waste, and meeting relevant specifications or end use standards is a key consideration in assessing whether a waste has been substantially transformed (DWER 2018).

The appropriate selection of end use standards to assess whether waste materials have been substantially transformed into recycled products is dependent on a number of factors, such as:

- the original waste composition;
- the nature and type of transformation process;
- the proposed end use for the recycled product; and
- the relevance of existing published specifications or standards such as department guidelines or Australian Standards.

The following sub-sections describe existing published specifications and standards that may

be applicable to the recycled products produced at the premises, as well as the Licence Holder's current approach to product quality standards.

ASS/PASS validation criteria

The ASS Treatment Guideline (DER 2015b) sets out validation criteria that are required to be met to confirm the effective neutralisation of ASS/PASS. Condition 3 of the Existing Licence requires that treated ASS/PASS are validated in accordance with the procedures outlined in Section 2.5 of the ASS Treatment Guideline. This guideline requires the following validation criteria to be met to confirm the effective neutralisation of soils:

- the neutralising capacity of the treated soil must exceed the existing plus potential acidity of the soil (e.g. field peroxide pH ($\text{pH}_{\text{FOX}} > 5$);
- the neutralising material has been thoroughly mixed with the soil;
- soil pH must be in the range 6.0 to 8.5; and
- excess neutralising agent must remain within the soil until all acid generation reactions are complete and the soil has no further capacity to generate acidity.

Uncontaminated fill specification

On 27 April 2018, the *Environmental Protection Amendment Regulations 2018* were gazetted and the Landfill Definitions were amended to allow for the use of clean fill or uncontaminated fill at a clean fill premises without the need for a landfill premises licence or payment of the waste levy.

In accordance with the Landfill Definitions, uncontaminated fill is defined as:

- a) inert waste type 1 (excluding asphalt and biosolids) that meets the requirements set out in Table 6 of the Landfill Definitions, as determined by relevant sampling and testing carried out in accordance with the requirements set out in Table 7 of the Landfill Definitions; and
- b) neutralised acid sulfate soil that meets the requirements for relevant metals, metalloids and sulfate set out in Table 6 of the Landfill Definitions, as determined by relevant sampling and testing carried out in accordance with the requirements of Table 7 of the Landfill Definitions.

A clean fill premises is a premises on which all of the waste that is, or has ever been, accepted for burial is uncontaminated fill or clean fill, as determined by reference to the Landfill Definitions. Recycled fill material that does not meet the definition of uncontaminated fill cannot be disposed to a clean fill premises.

Australian standards

The *Australian Standard 4419 Soils for landscape and gardening use* (AS 4419) may be relevant to assessing whether some of the blended water retentive soils produced at the premises have been substantially transformed from their component waste inputs such as ASS/PASS, Class I contaminated soils or Class IV contaminated soils. AS 4419 specifies physical, chemical and biological requirements for different types of soils, including physical contaminant limits for glass, metal and plastics. AS 4419 does not specify chemical contaminant limits (e.g. hydrocarbons or pesticides) for soils, but requires that all soils fully comply with chemical contaminant provisions of the current version of State or Territory guidelines for use in application to land.

The *Australian Standard 4454 Composts, soil conditioners and mulches* may be relevant to assessing whether some of the blended water retentive soils produced at the premises have been substantially transformed from their component waste inputs. The scope of this application does not include changes to composting activities or green waste acceptance

rates at the premises. However, peat that is received as ASS/PASS and initially treated under Category 61A could be an ingredient in soil conditioners and mulches produced at the premises. AS 4454 specifies physical, chemical and biological contaminant limits for soil conditioners and mulches.

Condition 17 in the Existing Licence requires the Licence Holder to sample and test blended soils in accordance with the requirements of AS 4419 and composts in accordance with the requirements of AS 4454.

Other standards

Under the current regulatory framework, end use standards for recycled products can be determined on a site-specific basis by the waste recycling facility occupier. This approach may be used where there is an absence of published specifications or standards for a particular type of recycled product, or the waste recycling facility occupier considers that an alternative end use standard is appropriate based on the intended end use of the recycled product.

Waste recycling facility occupiers must satisfy themselves that they can justify the suitability of their chosen standard based on the intended end use of the recycled product.

Licence Holder's standards

The Licence Holder implements post-treatment validation testing to verify the effectiveness of onsite treatment processes and final product testing to verify the suitability of product quality for the intended end uses.

Based on the Licence Holder's *Acid Sulfate Soils Management Plan* (Eclipse Soils 2021a), neutralisation of ASS/PASS is considered successful if, after neutralisation, the treated soils meet the following validation criteria:

- individual verification samples have field test results of pH (pH_F) > 6 and peroxide pH (pH_{FOX}) > 5.0 and this is confirmed by lab testing; and
- the total potential acidity is less than the laboratory limit of reporting.

The Licence Holder's current end use standards for potential contaminants in clean structural fill and blended water retentive soil products are outlined in Table 6. These parameters and end use standards are based on the Licence Holder's *Quality Control Plan* (Eclipse Soils 2021b) and *Structural Fill Sand Production Protocol* (Eclipse Soils 2021c). The Licence Holder has additional end use standards for the physical and chemical properties of clean structural fill and blended water retentive soil products (e.g. particle size distribution, plant nutrient content and wettability).

Table 6: Licence Holder's end use standards for contaminants in clean structural fill and blended water retentive soils

End use standard	Parameters
Ecological Investigation Levels (EILs) from the <i>Assessment levels for soil, sediment and water</i> (DEC 2010)	Metals: arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc Pesticides: dieldrin, aldrin, DDT/DDD/DDE, heptachlor, heptachlor epoxide, chlordane (cis/trans) Hydrocarbons: total petroleum hydrocarbons C ₁₀ -C ₃₆ Polycyclic aromatic hydrocarbons: benzo(a)pyrene BTEX: benzene, toluene, ethylbenzene and xylenes

End use standard	Parameters
Tested to National Association of Testing Authorities (NATA) accredited laboratory levels of detection	Asbestos

4.3 Key findings

Based on the regulatory framework for waste, the Delegated Officer has made the following key findings in relation to the application:

1. The Licence Holder's ASS/PASS validation criteria are not consistent with the requirements of the ASS Treatment Guideline (DER 2015b) as they do not include a maximum soil pH value of 8.5. Validation monitoring results reported in the 2020-2021 AER indicate that ASS/PASS neutralised at the premises regularly exhibit pH_F and potassium chloride pH (pH_{KCl}) values above the upper limit of 8.5 specified in the ASS Treatment Guideline (DER 2015b). The Licence Holder indicates (Appendix 1) that the cause of high soil pH results in post-treatment validation samples is the naturally high pH of some PASS received at the premises. The Delegated Officer considers this to be an acceptable reason for some post-treatment validation samples deviating from the performance criteria in Section 2.5.6 of the ASS Treatment Guideline. Based on information provided by the Licence Holder about their ASS/PASS treatment method, the Delegated Officer is satisfied that there should be minimal risk of pH overshoot (i.e. generation of excess alkalinity) in treated materials.
2. The Licence Holder's current end use standard for clean structural fill and blended water retentive soils is based on assessment levels that have been superseded by more recent publications. The assessment levels outlined in DEC (2010) were superseded by investigation and screening levels published in the *National Environmental Protection (Assessment of Site Contamination) Measure 2013* (NEPM ASC) in 2013.
3. The NEPM ASC advises that: *“Investigation and screening levels are intended for assessing existing contamination and to trigger consideration of an appropriate site-specific risk-based approach or appropriate risk management options when they are exceeded. The use of these levels in regulating emissions and application of wastes to soil is inappropriate...the inclusion of an investigation and screening level in this guidance should not be interpreted as condoning discharges of waste up to these levels.”*

Based on the above guidance, the Licence Holder's use of EILs as a general end use standard for clean structural fill and blended water retentive soil products is not an appropriate application of investigation levels.
4. The uncontaminated fill specification¹, as outlined in the Landfill Definitions, is

¹ The uncontaminated fill thresholds are based on investigation and screening levels from the NEPM ASC and other international publications of assessment levels. This approach is not consistent with guidance from the NEPM ASC which indicates that investigation and screening levels should not be interpreted as condoning discharges of waste up to these levels. However, when the uncontaminated fill specification was developed, it was considered that these investigation and screening levels provided a practical starting point from which thresholds could be derived (DWER 2019b). This was considered an acceptable approach given that there was an absence of sufficient Western Australian data to derive thresholds, specifically for the reuse of waste-derived fill, or a legislative mechanism to allow for site-specific or application-specific reuse of waste (DWER 2019b).

an appropriate end use standard for assessing whether a waste has been substantially transformed into a fill material product. Waste recycling facility occupiers may use an alternative end use standard to assess whether a waste has been substantially transformed into a fill material product. However, the current waste regulatory framework limits how recycled fill materials that do not meet the uncontaminated fill specification can be used.

5. The department does not have published guidance on a suitable end use standard for assessing whether a waste has been substantially transformed into a blended water retentive soil product. It is therefore the waste recycling facility occupier's responsibility to determine a suitable end use standard based on the factors discussed in Section 4.2.
6. The regulatory controls in the Existing Licence do not specify end use standards for recycled products that are produced using treated ASS/PASS, Class I contaminated soils or Class IV contaminated soils. Additional regulatory controls are required to align the conditions of the licence with the regulatory requirements outlined in the *Factsheet – Assessment whether material is a waste* (DWER 2018).

5. Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (3/06/2021)	None received	N/A
Local Government Authority advised of proposal (8/06/2021)	<p>The City of Kwinana replied on 21/06/2021 and 24/06/2021 confirming that temporary Planning Approval was issued to the premises in 2020 for a period of five years subject to conditions (DA9585 and DA9586).</p> <p>The City of Kwinana highlighted that Condition 17 of the relevant Planning Approvals states the following:</p> <p><i>Composting of green waste, treatment of contaminated and acid sulfate soils, blended soils production and production of fill products to be in accordance with the prescribed premises license issued under Part V of the Environmental Protection Act 1986, and the Management Plan for Abercrombie Road, Resource Recovery Operations dated July 2019 to the satisfaction of the City of Kwinana, on advice from the Department of Water and Environmental Regulation.</i></p> <p>It is noted that the management plan from 2019 (as referenced in the above condition) does not state the overall production capacity (this is only stated under the licence).</p>	The department shared the City of Kwinana's response with the Licence Holder and asked them to contact the City to directly address their requests for further information.

Consultation method	Comments received	Department response
	<p>The City of Kwinana asked for further information from the Licence Holder on the following matters:</p> <ul style="list-style-type: none"> • The applicant should therefore provide written confirmation to the City demonstrating that the amended operations can continue to operate in accordance with the approved management plan from 2019. This written confirmation should detail how the increase in production capacity from 200,000 tonnes to 500,000 tonnes per annum can be undertaken in accordance with the approved management plan. Where this cannot be demonstrated, an amended planning application is required to be submitted to the City and the existing management plan be updated. • It is requested the applicant provide information relating to the increase in production from 200,000 tonnes to 500,000 tonnes per annum and the impact this will have on truck traffic volumes and sizes using the local road network. • A condition of the Planning Approval exists over the site restricting traffic entering and exiting the site to be via Anketell Road only - vehicles are not permitted to use Thomas Road. It is requested that confirmation be provided that this will continue into the future. <p>In addition to the above comments, the applicant should be advised that regardless of the proposed license amendment, the operations are required to comply with all conditions of the relevant Planning Approvals issued by the City. Where this is not possible, the applicant is to submit an amended planning application to the City for consideration.</p>	
	<p>Following subsequent correspondence between the Licence Holder and the City of Kwinana, the City of Kwinana sent a supplementary response on 2/12/2021 confirming the following:</p> <ul style="list-style-type: none"> • From a planning perspective, the City can confirm that the information provided satisfies the queries raised in relation to the proposed increase in capacity and vehicle volumes/routes. • Regardless of the proposed changes, the operations are required to comply with all conditions of the relevant planning approvals issued by the City. • The above comments are in relation to the planning approvals only. It is advised that the Licence Holder contact the City's 	<p>Based on the City's response, the Delegated Officer is satisfied that the Licence Holder can implement the proposed changes under their existing planning approval. The Delegated Officer acknowledges the City's comments about the Extractive Industry Licence, but considers that this outstanding matter does not preclude the department from granting an amendment to the licence.</p>

Consultation method	Comments received	Department response
	Engineering team in relation to the existing Extractive Industry License. The Extractive Industry License is unrelated to the planning approvals and will be required to be amended prior to operating with the increased capacities (and associated increased truck movements).	The Licence Holder is responsible for ensuring they hold all necessary approvals before implementing the proposed changes at the premises.
Licence Holder was provided with draft amendment on (14/01/2022)	Refer to Appendix 1	Refer to Appendix 1

6. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

As a result of this licence amendment, stricter controls have been imposed on contaminated stormwater management in the bioremediation area. The Licence Holder will need to ensure they implement operational controls to maintain the required freeboard and prevent overtopping more effectively. Operational controls could include pumping stormwater between the two basins to achieve a more even distribution of stormwater or promoting evaporation by using stormwater for dust suppression on the pad. If the Licence Holder is unable to comply with the freeboard and overtopping conditions using operational controls, it may be necessary for an additional stormwater basin to be constructed to increase the available storage capacity. Approval for a new stormwater basin would require assessment by the department under a works approval application.

The Delegated Officer considers that a noise monitoring assessment is not required to verify that noise emissions from the proposed changes at the premises comply with the relevant assigned noise levels in the *Environmental Protection (Noise) Regulations 1997*. However, if surrounding land uses change or separation distances to receptors decrease, the Licence Holder may need to commission a noise verification assessment to confirm whether noise emissions from their premises comply with the relevant assigned noise levels.

The department will continue to review the adequacy of the current groundwater monitoring network based on the findings of ongoing monitoring and in the context of other potential changes at the premises. There remains some uncertainty about whether monitoring bores ARMB6A and ARMB7 are appropriately sited to assess potential impacts to groundwater from the bioremediation area.

6.1 Summary of amendments

Table 8 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process. Some condition numbers have changed as a result of amendments summarised in Table 8.

Table 8: Summary of licence amendments

Condition no.	Proposed amendments
Assessed production capacity	Category 61A design capacity increased from 200,000 tonnes per annual period to 500,000 tonnes per annual period.
1, Table 1 – Waste acceptance	<p>Reference to ‘Class I/II contaminated soils’ replaced with ‘Class I contaminated soils’ for consistency with other conditions in the licence (there is no difference between the concentration limits or leachable concentrations defined for Class I and II contaminated soils in the Landfill Definitions).</p> <p>The combined rate at which waste is received for clean fill, ASS and PASS, Class I, III and IV contaminated soils and soil contaminated with visible asbestos or ACM was increased from 200,000 tonnes to 500,000 tonnes.</p> <p>The rate at which waste is received was increased for specified waste types as follows:</p> <ul style="list-style-type: none"> • ASS and PASS from 100,000 tonnes per annual period to 300,000 tonnes per annual period. • Class I contaminated soils from 20,000 tonnes per annual period to 100,000 tonnes per annual period. • Class IV hydrocarbon and pesticide contaminated soils from 1,000 tonnes per annual period to 20,000 tonnes per annual period. <p>Addition of an acceptance specification for ASS and PASS and Class III and IV contaminated soils requiring that these materials are classified in accordance with Steps 1-6 and Figure 1 of the Landfill Definitions prior to acceptance (requirement moved from condition 3, Table 2 – waste processing table).</p> <p>Addition of an acceptance specification for ASS and PASS requiring that the net acidity of these soils is characterised in accordance with the <i>Identification and investigation of acid sulfate soils and acidic landscapes</i> (DER 2015c) prior to their acceptance on the premises.</p> <p>Editing of the acceptance specification for Class III and Class IV hydrocarbon and pesticide contaminated soils to clarify that concentrations of contaminants other than hydrocarbons and pesticides must be less than Class I landfill acceptance criteria.</p>
3, Table 2 – Waste processing	<p>Minor rewording of existing conditions for improved clarity.</p> <p>Changes to the waste processing requirements for ASS/PASS as follows:</p> <ul style="list-style-type: none"> • Editing of the ASS/PASS processing conditions to clarify that this material must be treated within the maximum short-term stockpiling timeframes specified in Section 2.8.2 of the ASS Treatment Guideline. • Additional requirement that treated material is tested and validated in accordance with Section 2.5.6 of the ASS Treatment Guideline prior to removal from the ASS/PASS area or green waste area. <p>Changes to the waste processing requirements for Class III and Class IV hydrocarbon and pesticide contaminated soils as follows:</p> <ul style="list-style-type: none"> • Additional requirement that the combined volume of untreated soils and soils undergoing treatment stored at the premises is no more than 40,000 m³ at one time. • Additional requirement that treated material is tested and validated to confirm that hydrocarbon and pesticide concentrations are equal to, or less than, Class I landfill acceptance criteria, prior to removal from the bioremediation area. • Removal of the requirement for treated material to be classified in accordance with Steps 1-6 and Figure 1 of the Landfill Definitions prior to soil blending, reuse or removal offsite. <p>Addition of soil blending to the authorised waste processes for clean fill as this is an acceptable practice and the department understands that this already occurs at the premises.</p>
5, Table 3 (formerly condition 6) –	Reworking of condition text and table headers to use more consistent and appropriate terminology.

Condition no.	Proposed amendments
Containment infrastructure	<p>Minor rewording of material descriptions to better describe the materials stored and/or treated within each item of containment infrastructure.</p> <p>Minor rewording of existing conditions for the ASS/PASS area and green waste area to avoid duplication with the requirements in condition 3, Table 2.</p> <p>Clarification that the ASS/PASS area and green waste area can both be used to store ASS/PASS, green waste, mulch or composting green waste.</p> <p>Addition of the ASS/PASS stormwater basins to this table with the inclusion of the following specifications:</p> <ul style="list-style-type: none"> • All runoff and leachate from the ASS/PASS area shall be directed to the stormwater basins that have been constructed from a minimum thickness of 300 mm compacted limestone. • A minimum 300 mm embankment freeboard must be maintained on the stormwater basins. <p>Correction of the bioremediation area construction specifications based on the revised specifications in amended works approval W4424/2008/1, as follows:</p> <ul style="list-style-type: none"> • The Existing Licence stated that the bioremediation area pad comprised a minimum thickness of 200 mm compacted clay with 150 mm crushed limestone overlain by a 1.00 mm HDPE liner. However, based on amended works approval W4424/2008/1 and related documents, the constructed bioremediation area comprises a compacted crushed limestone base overlain by a 1.50 mm HDPE liner, which has been overlain by 150 mm of screened sand and 150 mm of crushed limestone. • The Existing Licence stated that the bioremediation stormwater basins were lined with a 1.00 mm HDPE liner. However, based on amended works approval W4424/2008/1 and related documents, the stormwater basins were lined with a 1.50 mm HDPE liner. <p>Editing of the bioremediation area grading requirement to clarify that the surface is maintained to achieve a 1% fall towards the stormwater basin.</p> <p>Editing of the freeboard requirement for the bioremediation area stormwater basins to require that the 300 mm freeboard is measured and maintained in relation to the eastern retaining embankment. The eastern embankment is the lowest retaining embankment for both basins so maintenance of the freeboard in relation to this embankment is required to prevent overtopping of the basins onto the adjacent pads.</p> <p>Addition of the requirement that the stormwater basins must not overtop onto the adjacent HDPE lined cell or outside the HDPE lined area.</p>
6, Table 4 (formerly condition 7) – Infrastructure and equipment	<p>Rewording of condition text and table headers to use more consistent terminology.</p> <p>Addition of mobile equipment (screens, trommels, stackers, grinder, loaders, excavators, bobcats, telehandlers, tractors, dozers and rollers) and related operational requirements to the infrastructure and equipment controls table. All mobile equipment is required to be maintained in good working order.</p> <p>Addition of the requirement for at least one water truck with a capacity of at least 15,000 kL to be present on the premises at all times.</p> <p>Replacement of the abstraction bore production rate requirement with reference to the two abstraction bores being licensed to take groundwater by GWL109942, granted under section 5C of the <i>Rights in Water and Irrigation Act 1914</i>.</p>
7, Table 5 (formerly condition 4)	<p>Reconfiguration to specify the following stockpile height limits:</p> <ul style="list-style-type: none"> • 30 mAHD in the main screening area; • 35 mAHD in the north-eastern stockpiling area; and • 7 metres above the base of the stockpile in all other areas.
8, Table 6 – Dust management	<p>Rewording of table header to use consistent terminology with condition text.</p> <p>Minor rewording of 'water sprays' to 'reticulated sprinkler system' for consistency with equipment terminology used in condition 6.</p>

Condition no.	Proposed amendments
9 and 10 – Output testing	<p>New conditions added to ensure outputs from the premises (wastes and products) are appropriately tested and classified based on their intended end use, and to align with the regulatory framework for waste (see Section 4 of this Amendment Report). These conditions are as follows:</p> <ul style="list-style-type: none"> • Outputs from the premises that are intended for disposal to landfill are classified in accordance with Steps 1-6 and Figure 1 of the Landfills Definitions prior to removal offsite. • Products are tested and shown to conform to the uncontaminated fill requirements in Table 6 and Table 7 of the Landfill Definitions or another end use standard.
15 (formerly condition 13) – Asbestos product testing recordkeeping	Removal of the requirement for records of asbestos testing in products derived from asbestos or ACM contaminated soils to be retained for two years because this contradicts the record keeping retention period specified in condition 28 of the Revised Licence.
17 (formerly condition 15) – Timing of monitoring events	Removal of reference to quarterly monitoring because no quarterly monitoring is specified in the Revised Licence.
18, Table 7 (formerly condition 16) – Input and output monitoring	<p>Replacement of the list of waste types to be monitored and recorded under waste inputs with a reference to the waste types specified in Table 1.</p> <p>Replacement of the term 'other outputs' with 'product outputs'. Editing of the list of product outputs to remove wastes and use product terminology that is more representative of the three main product types produced at the premises, as follows:</p> <ul style="list-style-type: none"> • blended soils – applies to products comprised of a mixture of soils and composted green waste; • composted mulches, soil conditioners and composts – applies to products comprised of composted green waste only; and • fill products.
20, Table 9 (formerly condition 18) – Groundwater monitoring	Editing to allow in-field non-NATA accredited analysis of standing water levels, pH, electrical conductivity, redox potential and dissolved oxygen.
Former licence conditions 21 and 22 and Table 10 – Improvement conditions	The improvement conditions relating to installation of two additional groundwater monitoring bores have been removed because the requirements in these conditions have generally been satisfied. The Licence Holder installed ARMB7 and ARMB8 in January 2021, then later redrilled these bores in April 2021 and has submitted satisfactory bore construction reports for the redrilled bores.
25 – Recordkeeping for contaminated soils	New condition specifying recordkeeping requirements for Class I, III and IV contaminated soils received at the premises.
26 – Recordkeeping for products	New condition specifying recordkeeping requirements for products produced at the premises.
27 – General recordkeeping	New condition outlining general recordkeeping requirements not specified under conditions 23 to 26. This approach aligns with the current regulatory approach to recordkeeping

Condition no.	Proposed amendments
	requirements.
28 (formerly condition 25) – General recordkeeping	Minor rewording of condition to align with current regulatory approach to recordkeeping requirements. These amendments include changing the retention period for all records to the duration of the licence and requiring that records are available to be produced to an inspector or the CEO as required.
29 (formerly condition 26) - Complaints	Reworking of condition to align with current regulatory approach to recordkeeping requirements for complaints.
31, Table 11 (formerly condition 28) - AER	<p>Reworking of the condition text for improved clarity.</p> <p>Amending the reporting requirement for ASS and PASS validation and testing results to be a tabulated summary. The Licence Holder would not be required to submit laboratory test reports to satisfy this reporting requirement.</p> <p>Addition of a new reporting requirement for a tabulated summary of treated Class III and IV contaminated soil validation and testing results.</p> <p>Addition of a new reporting requirement to provide a list of the different products produced at the premises and specification of the end use standard that each product conforms to.</p> <p>Additional detail about the requirements for the reporting of input and output monitoring.</p>
32, Table 12 (formerly condition 29) – Non-annual reporting requirements	<p>Additional reporting requirement for laboratory reports of ASS/PASS and Class III and IV contaminated soil validation testing, subject to CEO request.</p> <p>Additional reporting requirement for product end use standards and testing analytical results, subject to CEO request.</p> <p>Clarification of the non-annual reporting schedule for asbestos fibre monitoring and recycled product testing because the previous wording was not clear and caused confusion. The requirement for a monitoring report to be submitted after the initial four weeks of asbestos fibre monitoring has been removed because this requirement was satisfied during 2020. The timeframe for submission of six monthly reports has been extended to be within 30 days of each six monthly period ending so that every second submission date aligns with the submission date for the AER.</p>
Definitions	<p>Amendments to guideline definitions to reflect recent revisions to these documents and remove publication dates, in accordance item (d) in the Interpretation section of the licence.</p> <p>Removal of defined terms that are not used in the conditions of the Revised Licence including 'AS 1726', 'ASTM D5092/D5092M-16', 'DER', 'natural ground level', 'quarterly' and 'uncontaminated fill'.</p> <p>Addition of a definition for 'AS 4964', 'ASS Identification and Investigation Guidelines', 'end use standard', '<i>Factsheet: Assessing whether material is waste</i>' and '<i>Guideline: Managing asbestos at construction and demolition waste recycling facilities</i>'.</p> <p>Editing of the definition for 'product' so that it applies to all recycled products produced at the premises, rather than just soils that have been screened to remove asbestos or ACM. The new definition means that the term 'product' is applicable to a fit for purpose recycled product that has been produced from the substantial or material transformation of waste through treatment, reprocessing and/or screening so that it is no longer waste. The definition also refers to the <i>Factsheet: Assessing whether material is waste</i> for relevant factors for determining whether a material meets this description.</p> <p>Editing of the term for 'six monthly' to 'six monthly period' for clarity.</p>
Schedule 1, Figure 7	Replacement of the map of groundwater monitoring bore locations to show the newly installed AMRB7 and ARMB8.
Schedule 1, Figure 8	Replacement of Figure 8 with a map of areas on the premises where different maximum stockpiles heights apply, as specified under condition 7 of the Revised Licence.

Condition no.	Proposed amendments
Attachment 2	Removal of the following sections of the ASS Treatment Guideline: 2.8, 2.8.1, 2.8.3, 2.8.4, 2.8.5, 2.9, 2.9.1, 2.9.2 and 2.9.3. These sections are not referenced in the conditions in the Revised Licence which does not permit medium-term or long-term stockpiling of ASS/PASS before treatment. Section 2.8.2 of the ASS Treatment Guideline has been retained because it is relevant to short-term stockpiling.
Attachment 4	Replacement of the Asbestos factsheet with the revised factsheet from the current version of the <i>Guideline: Managing asbestos at construction and demolition waste recycling facilities</i> which was published in April 2021. The only material change because of this amendment is the removal of the factsheet section titled <i>Disposal sites for material containing asbestos</i> which contained an outdated list of landfill sites.

References

1. Aurora Environmental 2021, *2020/2021 Quarterly groundwater monitoring report, Abercrombie Road Resource Recovery Centre, Abercrombie Road, Kwinana, WA.* (DWER record DWERDT483771)
2. Department of Environment and Conservation 2008, *Environmental Protection Act 1986 – Amended Works Approval W4424/2008/1*, Perth, Western Australia. (DWER record A156918)
3. Department of Environment and Conservation 2010, *Assessment levels for soil sediment and water*, Perth, Western Australia.
4. DER 2015a, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. DER 2015b, *Treatment and management of soil and water in acid sulfate soil landscapes*, Perth, Western Australia.
6. DER 2015c, *Identification and investigation of acid sulfate soils and acidic landscapes*, Perth, Western Australia.
7. DOH, 2014, *Contaminated Sites Ground and Surface Water Chemical Screening Guidelines*, Perth, Western Australia.
8. Department of Water and Environmental Regulation (DWER) 2018, *Factsheet – Assessing whether material is waste*, Perth, Western Australia.
9. DWER 2019a, *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)*, Perth, Western Australia.
10. DWER 2019b, *Final report: Review of the uncontaminated fill thresholds in Table 6 of the Landfill Waste Classification and Waste Definitions 1996 (as amended 2018)*, Perth, Western Australia.
11. DWER 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
12. DWER 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
13. DWER 2021a, *Amendment Report, L8974/2016/2 Eclipse Soils Pty Ltd*, Perth, Western Australia. (DWER record A1967374)
14. DWER 2021b, *Guideline: Assessment and management of contaminated sites*, Perth Western Australia.
15. Eclipse Soils 2021a, *Acid Sulfate Soils Management Plan*, Perth, Western Australia. (DWER record A2068828)
16. Eclipse Soils 2021b, *Quality Control Plan*, Perth, Western Australia. (DWER record A2068828)
17. Eclipse Soils 2021c, *Structural Fill Sand Production Protocol*, Perth, Western Australia. (DWER record A2068828)
18. Standards Australia 2012, *Australian Standard 4454 Composts, soil conditioners and mulches*, Sydney, Australia.
19. Standards Australia 2018, *Australian Standard 4419 Soils for landscape and gardening use*, Sydney, Australia.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
6	<p>Eclipse understands DWER's intention of the condition to limit of the number of screens, trommels and stackers onsite is to reduce the potential for dust and noise emissions. However, this condition is not likely to have the intended effect, and may instead reduce efficiencies, increase the risk of emission in certain situations and limit the beneficial recycling of materials while in turn providing no amenity or environmental benefit.</p> <p>An increase in machine numbers does not necessarily reflect a higher potential to cause a dust emission. For example, using 2 screens in series allows mulch to be screened more efficiently, with lower machine settings, creating less noise and less dust than a single screen. The use of stackers reduces handling of materials compared to stockpiling with a loader and reduces the potential to cause dust lift off. Multiple stackers can be used in series if products are required to be transported further for stockpiling, further reducing handling with a loader. Stackers also create conical stockpiles where dust lift off is less likely and easier to manage.</p> <p>Activities onsite are monitored and managed closely to ensure there are no emissions to the environment such as dust and noise. Suitable controls are currently in place to mitigate dust lift off for Eclipse' current and future capacity including the wetting down of stockpiles and roads using the reticulated dust suppression system and water cart.</p> <p>Eclipse requests the maximum machine numbers be removed from Column 2 of Table 4 and the proposed Condition 6 to be changed to the following:</p> <p><i>The licence holder must ensure that the infrastructure and equipment specified in column 1 of Table 4 is maintained and operated in accordance with the operational requirements specified in column 2 of Table 4. Equipment must be operated with sufficient controls in place to ensure there are no emissions including noise and dust.</i></p>	<p>The Delegated Officer considers that the Licence Holder has provided sufficient justification for the number limits for screens, trommels and stackers to be removed from the Revised Licence. The Licence Holder's proposed rewording of condition 6 has not been implemented as the requirement for no emissions of noise or dust to be generated from equipment is not considered to be risk-based or achievable.</p> <p>The Delegated Officer considers that other dust controls specified in conditions 6, 7 and 8 of the Revised Licence are sufficient to mitigate the potential for dust emissions to be generated from mobile equipment and the siting of the premises is suitable to mitigate the risk of noise emissions from mobile equipment impacting off-site sensitive receptors.</p>

Condition	Summary of Licence Holder's comment	Department's response
6	<p>Eclipse Soils also requests <i>Abstraction bores with combined minimum production rate of 120,000 litres/hour</i> in Column 1 of Table 4 to be replaced with the following:</p> <p><i>Abstraction bores taking water under licence GL109942(7).</i></p>	<p>The Delegated Officer considers that it is appropriate to remove the minimum production rate of the abstraction bores and instead refer to the two bores being licensed to take groundwater by GWL109942, under section 5C of the <i>Rights in Water and Irrigation Act 1914</i>. The Licence Holder will need to ensure the abstraction bores have a sufficient operating capacity to comply with conditions 6 and 8 of the Revised Licence.</p>
7	<p>Eclipse Soils requests the proposed Condition 7 be changed to the following:</p> <p><i>The licence holder shall ensure that all stockpiles on Lot 115 on Plan 48295 do not exceed a height of 7 metres above the base of the stockpile. Stockpiles on Lot 2 on Plan 29392 must not extend higher than 35 metres above the Australian Height Datum.</i></p> <p>The maximum height of stockpiles of 35m AHD is calculated based on 7 metres above the average natural ground level surrounding the void on Lot 2. The average natural ground level was calculated to be 28 m AHD based on the enclosed plan <i>Abercrombie Road – Postans Lot 115/2/ Levels 30 June 2014</i>. The levels surrounding the southeast corner of the void were excluded in the calculation, as this area of the void is designated for screening soils potentially or actually containing asbestos fragments and sits approximately 20-25m below natural ground level.</p> <p>This condition will fall more closely in line with the previous condition and takes into account stockpiles within the void, where the base of stockpile is below the surrounding natural landform stockpiles. Stockpiles in the void can be taller than 7m without extending higher than 7m above the surrounding landform and dust lift off can be easily managed.</p> <p>All stockpiles are monitored and managed for dust very carefully and a large number of controls are in place to mitigate dust lift off including the abstraction bores, reticulated dust suppression system and use of the water cart.</p> <p>When stockpiles are formed correctly in a conical shape, dust lift off is less likely and is easy to mitigate. Moreover, larger stockpiles are easier to manage for dust on a volume basis as the surface area is greatly reduced compared to a greater number of stockpiles with a height of only 7m.</p> <p>There have been no issues with dust management to date under the current stockpile height condition.</p> <p>Eclipse Soils also notes stockpiles heights for other premises in the vicinity of the Abercrombie Rd site far exceed 7m above natural ground level including:</p> <ul style="list-style-type: none"> Alcoa bauxite residue stockpiled greater than 40m above natural ground level (located directly across Anketell Rd approximately 250m North of the Abercrombie Rd Site). 	<p>The Delegated Officer considers that it would be acceptable to allow stockpiles higher than 7 m within quarry voids in the east of the premises, as was allowed under the Existing Licence. However, the Licence Holder's proposed approach to limiting stockpile heights is not considered suitable for the following reasons:</p> <ul style="list-style-type: none"> Only a small portion of Lot 2 comprises topographic depressions formed by quarry voids. The approach to limiting stockpile heights relative to a height datum should only apply within the quarry void areas, not across the whole of Lot 2. There is too much variation in the elevation of natural ground level around the perimeter of Lot 2 (about 20 to 29 m AHD) to specify one maximum stockpile height datum across this whole area. <p>Based on these considerations, the Delegated Officer has revised condition 7 to allow stockpile heights up to 30 mAHD in the main screening area and 35 m AHD in the surrounding area termed the 'north-eastern stockpiling area'.</p> <p>The boundary of the north-eastern stockpiling area was determined based on the Licence Holder's indication of current quarry void areas and to align with the edge of the ASS/PASS area to facilitate easier delineation of this area for</p>

Licence: L8974/2016/2

Condition	Summary of Licence Holder's comment	Department's response
	<ul style="list-style-type: none"> Waste Stream waste stockpiles stockpiled greater than 50m above natural ground level (located approximately 900m Southwest of the Abercrombie Rd Site). 	<p>implementation and compliance and enforcement purposes.</p> <p>A lower maximum stockpile height has been specified for the main screening area because the natural ground level of the surrounding embankments are lower than other parts of the north-eastern stockpiling area. In combination with other controls on the licence, the Delegated Officer considers this stockpile height limit to be a suitable control for mitigating the generation of dust emissions from the storage and processing of ACM contaminated soils in this area.</p>
Section 2.2 of Amendment Report	<p>The draft Amendment Report included the following request for clarification:</p> <p><i>The department notes that clean fill, ASS/PASS, Class I contaminated soils and Class IV contaminated soils may be used as inputs to blended water retentive soils produced at the premises. The production of blended soils and composts (including mulches and soil conditioners) is regulated under Category 67A. However, the Licence Holder did not propose to increase the Category 67A production capacity of 50,000 tonnes per annual period within the scope of the application. Licence Holder to confirm whether the total quantity of blended soils and composts (including mulches and soil conditioners) produced at the premises is predicted to exceed 50,000 tonnes per annual period once the proposed increases to Category 61A inputs have been implemented.</i></p> <p>The Licence Holder provided the following response:</p> <p><i>Eclipse Soils is not proposing to increase the Category 67A production capacity above 50,000t per annual period at this stage. The total quantity of blended soils and composts (including mulches and soil conditioners) produced at the premises is not predicted to exceed 50,000 tonnes per annual period once the proposed increased to Category 61A inputs have been implemented.</i></p>	Based on the Licence Holder's response, no changes to the Revised Licence are required.
Section 3.1.1 of Amendment Report	<p>The Licence Holder's application stated that the two abstraction bores deliver 97,000 L/hour of water to the dust suppression system. The draft Amendment Report included the following request for clarification:</p> <p><i>The Existing Licence requires that the abstraction bores operate at a combined minimum production rate of 120,000 L/hour. Licence Holder to confirm if the production rate has reduced or has been retained at 120,000 L/hour.</i></p> <p>The Licence Holder provided the following response:</p> <p><i>Eclipse Soils confirms the production rate of the abstraction bores at Abercrombie Rd have been retained at 120,000 L/hour.</i></p>	Based on the Licence Holder's response, no changes to the Revised Licence are required. Refer to condition 6 above for discussion of separate changes to this condition.

Licence: L8974/2016/2

Condition	Summary of Licence Holder's comment	Department's response
Section 4.2 of the Amendment Report	<p>The draft Amendment Report included the following request for clarification:</p> <p><i>It is noted that the Quality Control Plan refers to:</i></p> <ul style="list-style-type: none"> • <i>EILs being derived from the Assessment and management of contaminated sites (DER 2014). However, this document does not publish values for EILs, and refers to the EILs as published in the National Environmental Protection (Assessment of Site Contamination) Measure 2013.</i> • <i>the source of heavy metal testing standards in Section 4.2.3 as the Draft Standards for Organics Applied to Land, WA Waste Management Board 2006.</i> <p><i>Please confirm whether the end use standards for metal, pesticide and hydrocarbon concentrations in blended water retentive soils are the EILs from the Assessment levels for soil sediment and water (DEC 2010) as has previously been indicated to the department.</i></p> <p>The Licence Holder provided the following response:</p> <p><i>Eclipse Soils confirms all blended water retentive soil products must meet Ecological Investigation Levels (EILs) as contained in: Department of Environment and Conservation (2010) – Assessment Levels for Soil, Sediment and Water. Contaminated Sites Management Series.</i></p>	Based on the Licence Holder's response, no changes to the Revised Licence are required.
Section 4.3 of the Amendment Report	<p>The draft Amendment Report included the following request for clarification:</p> <p><i>Licence Holder to explain:</i></p> <ul style="list-style-type: none"> • <i>why neutralised ASS/PASS do not comply with the upper limit of the soil pH range specified in Section 2.5.6 of the ASS treatment Guideline; and</i> • <i>whether neutralised ASS/PASS with a soil pH above 8.5 undergo further treatment, such as blending with other materials, to achieve a lower pH in final clean structural fill or blended water retentive soil products.</i> <p>The Licence Holder provided the following response:</p> <p><i>Eclipse Soils treats ASS/PASS with calcium carbonate (limestone), the pH of which generally ranges from 8.1 to 8.5. Liming rates are calculated using DWER's lime rate calculator.</i></p> <p><i>The pH of natural soils in Perth range as high as 9.5. Many soils received as ASS/PASS by Eclipse have a natural field pH above 8.5 (although SPOCAS testing has indicated the soils has potential to become acidic through oxidisation). Soils from the Guildford Formation, for example, can have a natural field pH of up to 9.5 and a Net Acidity (percentage of sulfur) above the DWER ASS guidelines requiring treatment. In these cases, the high pH is existing and the addition calcium carbonate does not further increase pH.</i></p> <p><i>In some cases, Eclipse Soils may blend soils with a naturally high pH to reduce the pH of the final</i></p>	Based on the Licence Holder's response, no changes to the Revised Licence are required. This information has been factored into the key findings discussed in Section 4.3.

Condition	Summary of Licence Holder's comment	Department's response
	<p><i>product. However, this is determined by the product type and the requirements of the receiving site.</i></p> <p><i>In the case of blended soils, the Australian Standard AS4419 allows for a pH of up to 9.0, although Eclipse Soils generally targets a pH of 7.5 for blended soils products.</i></p> <p><i>In the case of fill products, soils with a natural pH of up to 9.5 are inert and environmentally and geotechnically fit for purpose as structural fill. This material is not treated or blended with the aim of reducing pH.</i></p>	
<p>Section 6.1 of the Amendment Report</p>	<p>The draft Revised Licence grouped the licence holder's product outputs into the three categories of i) blended soils, ii) composted mulches, soil conditioners and composts and iii) fill products. The draft Amendment Report included the following request for clarification:</p> <p><i>Licence Holder to confirm that the three product types described above adequately capture all of the different products produced at the premises.</i></p> <p>The Licence Holder provided the following response:</p> <p><i>Eclipse Soils confirms the three product types currently captures the product produced at Abercrombie Rd.</i></p>	<p>Based on the Licence Holder's response, no changes to the Revised Licence are required.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY				
Application type				
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8974/2016/2	
		Relevant works approval number:		N/A
Date application received		23 March 2021		
Applicant and Premises details				
Applicant name/s (full legal name/s)		Eclipse Soils Pty Ltd		
Premises name		Abercrombie Road Resource Recovery Centre		
Premises location		Lot 115 on Plan 48295 (Vol 2602, Folio 976) and Lot 2 on Plan 29392 (Vol 2219, Folio 775) Postans WA		
Local Government Authority		City of Kwinana		
Application documents				
HPCM file reference number:		DER2016/000832-1~6 DWERDT430794		
Key application documents (additional to application form):		Initial supporting info appended to application form Response to request for further information (28 April 2021, A2006594)		
Scope of application/assessment				
Summary of proposed activities or changes to existing operations.		Increase in the assessed design capacity of Category 61A from 200,000 tonnes per annual period (tpa) to 500,000 tpa Increase in sub-limits of authorized waste: ASS and PASS from 100,000 tpa to 300,000 tpa Class I/II soils from 20,000 tpa to 100,000 tpa Class IV soils from 1,000 to 20,000 tpa		

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity
Category 61A: solid waste facility	200,000 tpa Sub-limits for waste types ASS and PASS 100,000 tpa Class I/II soils 20,000 tpa Class IV soils 1,000 tpa	Increase in the assessed product capacity of category 61A from to 500,000 tpa. Increase in sub-limits of authorized waste: ASS and PASS to 300,000 tpa Class I/II soils to 100,000 tpa Class IV soils to 20,000 t per annual period Note: the initial application gave the proposed throughputs in cubic metres, changed to tpa in the request for information.

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input type="checkbox"/> Expiry: Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Approval: Expiry date: If N/A explain why?

Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: Groundwater licence 109942
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004</i> , <i>Environmental Protection (Controlled Waste) Regulations 2004</i> , <i>State Agreement Act xxxx</i>)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Environmental Protection (Kwinana) (Atmospheric Wastes) Policy Area
Is the Premises subject to any EPP requirements?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Policy relates to particulate emissions and premises has potential to generate dust emissions.
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Site ID 5679 Classification: possibly contaminated – investigation required (PC–IR) Date of classification: 16 July 2010