# Decision Report

## Application for Works Approval

### Division 3, Part V *Environmental Protection Act 1986*

| | |
|---|---|
| **Works Approval Number** | W6349/2020/1 |
| **Applicant** | Puma Energy (Australia) Bitumen Pty Ltd |
| **ACN** | 147 981 020 |
| **File Number** | DER2020/000002 |
| **Premises address** | Puma Energy Kwinana<br>49 Port Road<br>Kwinana Beach, WA 6167<br><br>Legal description -<br>Part Lot 108 Vol 2953 Folio 177<br>Register No 108/DP400167<br>As defined in Schedule 1 and by the coordinates in<br>Schedule 2 of Works Approval |
| **Date of Report** | 3/07/2020 |
| **Status of Report** | Final |

# Table of Contents

# 1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

**Table 1: Definitions**

| Term | Definition |
|---|---|
| AACR | Annual Audit Compliance Report |
| ACN | Australian Company Number |
| AER | Annual Environment Report |
| AS | Australian Standards |
| Category/ Categories/ Cat. | Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations |
| CS Act | *Contaminated Sites Act 2003* (WA) |
| Decision Report | refers to this document. |
| Delegated Officer | an officer under section 20 of the EP Act. |
| Department | means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act. |
| DWER | Department of Water and Environmental Regulation<br>As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation. |
| EP Act | *Environmental Protection Act 1986* (WA) |
| EP Regulations | *Environmental Protection Regulations 1987* (WA) |
| $m^3$ | cubic metres |
| mg/L | milligrams per litre |
| NEPM | National Environmental Protection Measure |
| Noise Regulations | *Environmental Protection (Noise) Regulations 1997* (WA) |
| PM | Particulate Matter |
| $PM_{10}$ | used to describe particulate matter that is smaller than 10 microns (µm) in diameter |

| | |
|---|---|
| Prescribed Premises | has the same meaning given to that term under the EP Act. |
| Premises | refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report |
| Risk Event | As described in *Guidance Statement: Risk Assessment* |
| T | Means tonnes (unit of measure in metrics) |
| TRH | Total Recoverable Hydrocarbon |
| VOC | Volatile Organic Compounds |
| Works Approval Holder | Puma Energy (Australia) Bitumen Pty Ltd |
| WQPN | Water Quality Protection Note |
| $\mu g/m^3$ | micrograms per cubic metre |

# 2. Purpose and scope of assessment

Puma Energy (Australia) Bitumen Pty Ltd T/A Puma Energy (the Applicant) lodged a Works Approval application (the application) on 24 December 2019. The Applicant's current operations involve hot bitumen storage and dispatch which is not a prescribed premises category. The Applicant is proposing to produce crumbed rubber modified bitumen (CRMB) and polymer modified bitumen (PMB) using raw materials such as used crumbed rubber tyres/ conveyors belts, and plastic polymers that are mixed with bitumen. The Applicant's current operations are located at 49 Port Road, Kwinana (Figure 1).

On 19 May 2020, the Applicant notified DWER of proposed changes to the scope of works in the application including two stages of works. The application therefore includes the proposed construction, commissioning and initial operation of each stage.

In the first stage, the Applicant has proposed to construct and expand the current operational containment infrastructure by some earthworks, install two new mixing units and activated carbon scrubber systems to treat mixing vapours, pipe works to connect two new tanks emission points to the activated carbon scrubber systems, and installation of stirrers in the existing storage tanks. This stage of works is likely to be undertaken in the latter part of 2020. The second stage of works is likely to be undertaken in 2021 when two additional product storage tanks and pumps will be installed.

The scope of risk assessment includes the potential impacts from emissions and discharges during the construction, commissioning and operational phases of each stage.

This decision report documents the Delegated Officer's assessment and decision making consistent with DWER's published Regulatory Framework.

## 2.1 Application details

The Applicant provided the following documents to support their application for DWER's assessment.

**Table 2: Documents and information submitted by Applicant for assessment**

| Document/information description | Date received |
|---|---|
| Via email:<br>• IR-F09_Application Form_Works Approval _Puma Bitumen_2020_02_27_Final.pdf<br>• Supporting Information_2020_02_27 | 28 February 2020<br>(A1872674) |
| • HPE CM: Puma Kwinana Bitumen Works Approval Addendum to Application DER2020/00002 | 19 May 2020<br>(A1895357) |
| • HPE CM: Spelceptor Brochure | 20 May 2020<br>(A1895354) |

The Applicant applied for the following prescribed premises category as per the *Environmental Protection Regulations 1987* Schedule 1, and as shown in Table 3 below.

**Table 3: Prescribed premises category in the application**

| Classification of Premises | Description | Proposed Premises production or design capacity |
|---|---|---|
| Category 36 | Bitumen manufacturing: premises on which bitumen is mixed or prepared for use at places or premises other than those premises. | 116 kilo tonnes per annual period |

The Delegated Officer had regard to the applicability of Category 61A (solid waste facility) to the receipt and storage of up to 1872 kg of crumbed rubber per annum. Ultimately the Delegated Officer determined Category 61A was not required on the works approval as accepting, storage, mixing and any associated risk of emissions has been considered within the scope of assessment of Category 36 activities.

# 3. Overview of Premises

## 3.1 Background

The premises is located in Kwinana Beach in the City of Kwinana, approximately 42 km southwest of Perth (Figure 1) and also occurs within the Kwinana Industrial Area Policy defined under the *Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992*. The Applicant currently stores and dispatches hot bitumen, which is not considered a prescribed premises.

Part of the Lot is used by a separate entity, Bitumen Storage Solutions Pty Ltd (BSS). BSS is a Joint Venture (JV) operation between SAMI Bitumen Technologies and the Applicant. Bitumen is delivered to BSS site by ship and is transferred via a pipe to Applicant. The existing infrastructure at the Premises consists of four bitumen storage tanks – tank 103, tank 104, tank 105 and tank 106 respectively, each with 250 tonne capacity, a hot oil heater system housed within a 16.5m by 29.1m shed, and bitumen transfer pipes and pumps. The four existing storage tanks are in a wrapped around bunded area..

Contaminated stormwater from bunded areas is transferred via drains to an oily water separator (OWS) for treatment. The treated stormwater is discharged to an infiltration trench located about 150m from the bunded tanks. The infiltration trench is located within the boundary of the premises as shown in Figure 2. Most of the working operational areas of the premises are graded and concrete lined, except of the infiltration trench.

The BSS activities do not form part of this assessment. Figure 2 illustrates the premises boundary.

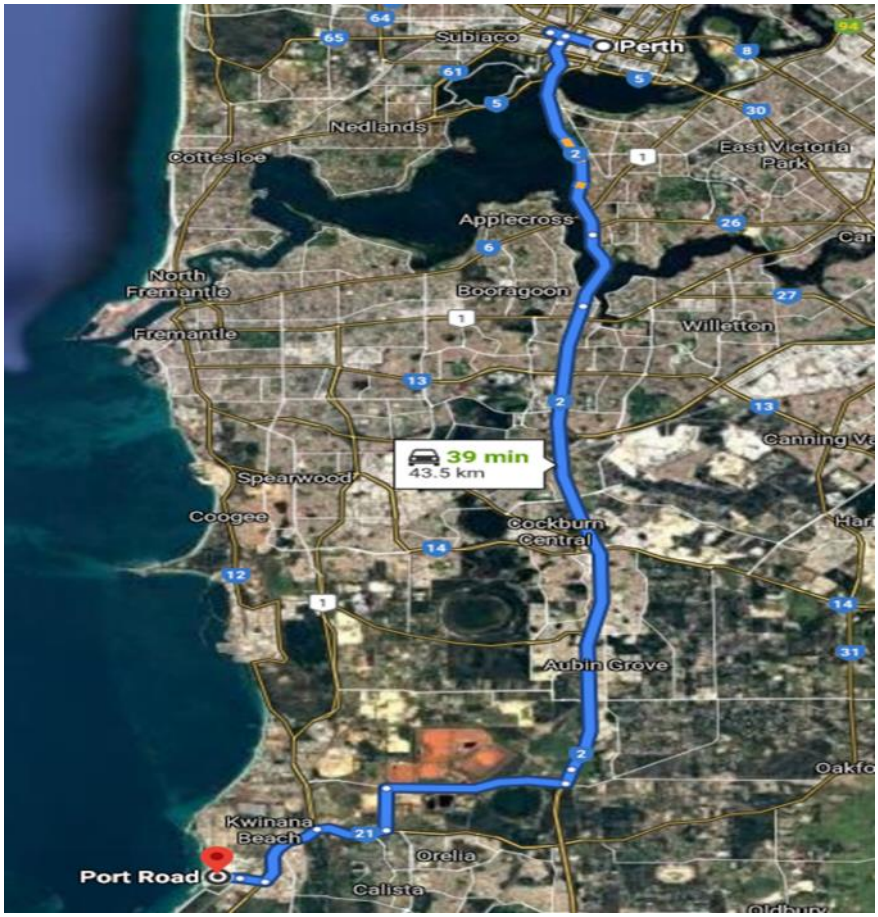
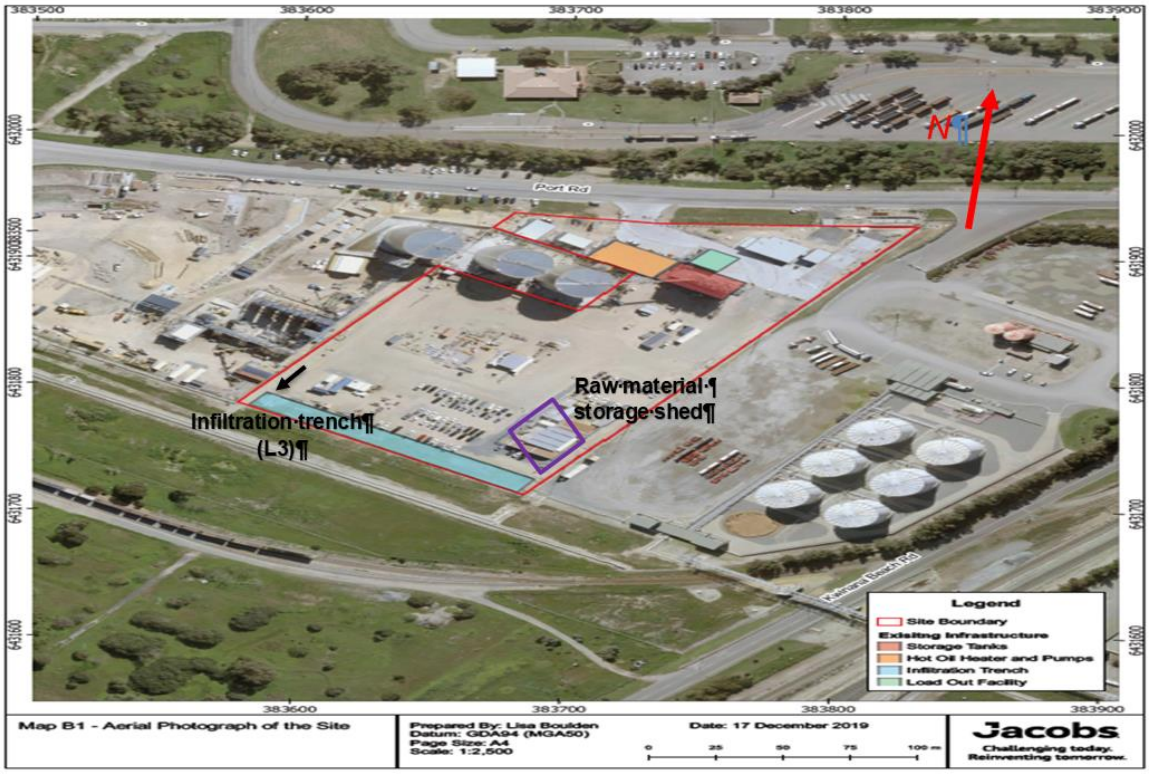



**Figure 1: Premises location**




*Source: Puma Energy application supporting documents dated 27/02/2020*.

**Figure 2: Premises boundary**

## 3.2 Infrastructure (proposed and existing)

The current and proposed infrastructure at the Premises, as it relates to Category 36 bitumen-manufacturing activities, is detailed in Table 4 and with reference to the Site Plans in Appendix 3.

**Table 4: Bitumen manufacturing facility Category 36 infrastructure**

| **Prescribed Activity Category 36: bitumen manufacturing** | | |
|---|---|---|
| The Applicant is proposing to construct infrastructure to manufacture mixed blend bitumen. To produce a mixed grade/blend bitumen, used crumbed tyres and conveyor belts and plastic polymers are mixed with bitumen in heated mixing tanks. | | |
| **No.** | **Infrastructure** | **Site Plan Reference**<br>Appendix 3: Premises Maps and Plans |
| **Stage one infrastructure (2020)** | | Map 1A: Layout of infrastructure (existing and proposed) |
| 1 | One new portable trailer mounted CRMB mixing unit with 25 tonne capacity and connected to the activated carbon scrubber for vapour treatment. | |
| 2 | One new portable trailer mounted PMB mixing unit with 25 tonne capacity and connected to the activated carbon scrubber for vapour treatment. | |
| 4 | A 210m$^2$ kerbed concrete slab with 100mm high perimeter kerbing to provide containment for the mixing units and the additive storage. The slab drains to a collection sump which is connected via a valve and underground pipeline to the OWS. The containment capacity of the slab is compliant with AS1940. | |
| 5 | One 70kL self bunded additive storage tank with a 25m$^2$ unloading concrete slab draining to a collection sump which is connected via a valve and underground pipeline to the OWS. | |
| 6 | Two new activated carbon scrubber systems for the CRMB and PMB mixing units comprising the following:<br>• a knockout pot for removal of moisture/condensate in the vapour flow stream;<br>• a stainless steel treatment chamber containing activated carbon filter beds designed to remove 95% of VOCs;<br>• an extraction fan; and<br>• a 4 m high stack fitted with a sampling port.<br>The scrubber systems will be located on concrete containment areas which drain to centre collection sumps. | |
| **Stage 2 infrastructure (2021)** | | Map 1A: Layout of infrastructure (existing |
| 7 | Two new storage tanks – TK-301 and TK-302 with 100 tonnes capacity each, equipped with stirrers and piped to the activated carbon scrubber system | |

| **Prescribed Activity Category 36: bitumen manufacturing** | | |
|---|---|---|
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| **No.** | **Infrastructure** | **Site Plan Reference**<br>Appendix 3: Premises Maps and Plans |
| | Extension of the existing storage tanks bunded area by 80 $m^2$ with a 650mm high bund wall.<br>This area will drain to a collection sump which is connected via a valve and underground pipeline to the OWS | and proposed) |
| 8 | Two new bitumen pumps and associated pipework.<br>The pumps will be located on a 25 $m^2$containment slab will be a minimum of 25 $m^2$.<br>The pump containment slab will drain to a collection sump which will drain via a valve and underground pipeline to the OWS | |
| **Exiting infrastructure** | | |
| 9 | Four existing storage tanks – TK-103, TK-104, TK-105 and TK-106 with 250 tonnes storage capacity each.<br>Each tank will have a stirrer installed, TK-103 and TK104 in 2020 and TK-105 and TK106 in 2021.<br>Tanks are located in a fully bunded area. The bunded area is 540$m^2$ with a 650mm high perimeter bund.<br>The bund is designed to comply with the Australian Standard AS1940.<br>Drainage from the storage tanks is transferred via an underground pipeline to the OWS. | Map 1A: Layout of infrastructure (existing and proposed) |
| 10 | Oil heater with a 10m high stack, heat exchange unit and transfer pumps are housed inside a 16.5m by 29.1m shed with a concrete floor/slab approximately 480$m^2$ with perimeter kerbing to a 100mm high and compliant to AS1940.<br>The area drains to a collection sump.<br>A fully closed system circulates hot oil through a network of pipes to bitumen storage tanks and to proposed mixing unit | |
| 11 | Bitumen truck loading and unloading facility with an 8m high ventilation to vent hot air from hot bitumen during transfer. The loading facility slab is 110$m^2$ , drains to a collection sump and is designed to comply with AS1940. | |
| 12 | Spelceptor 40 040.C1.2CA.300 OWS with 40$m^3$/h treatment capacity | |
| 13 | Raw material storage shed | Figure 2 |
| 14 | Infiltration trench | |

## 3.3 Proposed works

Infrastructure as proposed to be built are shown in Table 4 above. The construction of CRMB and PMB mixing units consist of two mixing units, two activated carbon scrubber systems, earthworks and establishment of concrete secondary containment in 2020. The second stage is to install two additional storage tanks TK-301 and TK-302 and two pumps (and required secondary containment) in 2021.

The Applicant is proposing to undertake construction to extend the existing storage tanks bunded area by 80m$^2$ to house the additional storage tanks. An additional civil earthworks to build a new 210m$^2$ concrete slab, includes drainage and kerbings. The new concrete slab will provide a secondary containment for the mixing units. In addition to this, a 25m$^2$ concrete slab will be constructed for the two new bitumen pumps and pipelines.

A 70kL self-bunded tank for additive storage (C2 combustible liquid) will be installed. The additive storage tank will be provided with a containment slab for unloading vehicles to capture spills. Although additives are supplied in 1000L IBCs (Intermediate Bulk Containers), the Applicant is proposing to store additive in a bulk tank for economic reasons. As this tank will be self-bunded, it will be installed post-construction and commissioning of the mixing units.

The Applicant expects standard construction hours of 7 am to 5 pm, over seven days.

The new infrastructure will consist of two new mixed bitumen storage tanks and two new CRMB and PMB mixing units. The two new tanks will be installed in 2021. The Applicant has advised that the current rate of receipting and dispatch of bitumen will remain the same. The mixed grade bitumen will be loaded onto tankers directly from the mixers when ready. There will be no storage of mixed grade bitumen until 2021 when the new storage tanks will be installed.

## 3.4 Commissioning

Commissioning of the CRMB and PMB mixing units will be undertaken over a number of weeks.

The following equipment function and performance will be tested and confirmed during commissioning:

- performance of activated carbon scrubbers efficiency and validation of air emissions through stacks testing and monitoring;
- in order to establish a performance limit, the carbon filter medium bed compaction rate will be measured for the activated carbon scrubbers. This will then indicate the need to inspect and possibly change the filter medium at a nominated frequency. This limit will be established based on a 20% increase in the pressure drop across the filter bed. In order to establish future filter replacement the 20% increase in pressure drop will be used as guide to trigger first inspection;
- commissioning of the CRMB and PMB units whereby equipment is operated without any throughput to confirm all operational components are functioning as designed; and
- during the load commissioning stages it is proposed to establish a monitoring frequency that is linked to the scrubber unit volumetric throughput and the rate at which the performance of the scrubber unit deteriorates. At this stage air emission monitoring concentration will be determined for the proposed 4000 tonnes production level for a given unit. An initial 4000 tonne production figure will be used to determine future monitoring programs and frequency and address maintenance and management of the both units – i.e. scrubber and mixing units.

## 3.5 Process description

The CRMB and PMB are prepared by mixing heated liquid bitumen and additives to achieve a desired grade bitumen to meet customers' requirements. Each mixing unit is capable of producing 25 tonnes per batch. The mixing process will take six hours from start to completion and operation will be on an as needed basis.

It is proposed that the mixed grade bitumen will only be produced on customer demand during 2020 and possibly extend to 2021. During these periods, the Applicant is proposing not to store any mixed grade bitumen, until the two new storage tanks TK-301 and TK-302 have been installed in 2021.

The raw materials such as crumbed rubber and polymers are delivered to the Premises in 1000kg bags, Figure 4. The bags are stored on hardstand areas under cover. The Applicant has installed Emergency Fire Boosters, Fire hydrants and fire extinguishers are located strategically throughout the Premises for fire prevention/suppression.

The raw materials are transferred using steel hoppers into the mixing units. Heated liquid bitumen is injected in the mixing unit using pumps and pipes. Following the injection of heated bitumen, crumbed rubber or polymer is added into the circulating mixture (Figure 3).

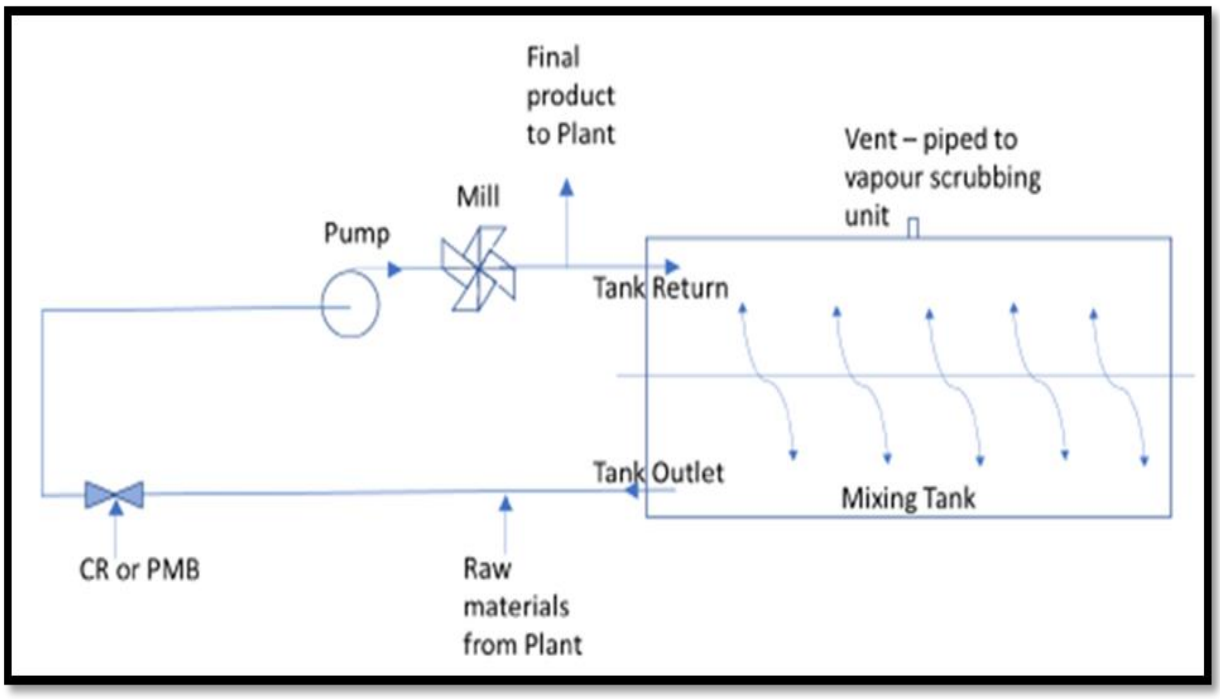
Depending on the grade being produced and the customer requirements, additives will be added in the mixing units at about 1-6% ratio to achieve desired grade and viscosity of the finished bitumen product. Heaters positioned under the mixing units maintain the temperature of bitumen mix for over 100 $^{0}$C. A milling process can be deployed where further homogenising of the mixture is needed.

The completed finished product is then transferred either directly to the road tankers via loading facility and/ or stored in 100 tonnes storage tanks at later stage. The mixture is kept hot using oil heaters under the tanks while being stirred continuously while in storage.

### 3.5.1 Heating of bitumen pipelines and storage tanks

A hot oil heating system circulates heated oil around the bitumen storage tanks and the pipes to maintain bitumen temperature. Bitumen in the pipelines and storage tanks is heated to ensure that it remains in a liquid state for transfer and pumping. Typically bitumen in the tanks and pipelines is maintained at temperatures ranging from 140°C to 185°C. Bitumen tanks are heated using heating coils that are installed inside the tank. The hot oil flows through these coils to supply heat to the bitumen in the tanks. Bitumen pipelines are heated via hot oil tracing lines, which runs along the pipelines within containment infrastructures. The hot oil heating system is a fully enclosed unit and stored within shed on hardstand in a covered area Figure 4.

In addition to hot oil heating, electrical heating is used for trailer mounted bitumen mixing units. Since these units are designed to be mobile, the use of electric heat tracing on the pipelines is a more practical solution. To heat the bitumen in the mixing tanks, electric heating elements are used. These elements are positioned underneath the mixing unit tanks to transfer heat through the tank shell into the bitumen.




*Source: Puma Energy application supporting documents dated 27/02/2020*.

**Figure 3: Schematic flow diagram of CRMB/PMB mixing unit and activated carbon scrubbing system**

Hot oil heating system

Crumbed rubber storage bags 1000kg each.

*Source: Puma Energy application supporting documents dated 19/05/2020.*

**Figure 4: Hot oil heating unit and crumbed rubber storage bags**

### 3.5.2 Waste generation and management controls

It is anticipated that liquid and solid wastes will be generated from bitumen spills and handling, transfer of product between the tanks, failure of pipes and pumps and overtopping of bitumen tanks. Spills from handling and transfer and equipment failure could release hydrocarbons in

and around containment bunds.

In order to manage spills and accidents the Applicant has proposed expansion of containment bunds. Currently the four bitumen tanks are fully bunded in an approximately 540 $m^2$ area and spills and potentially contaminated stormwater is captured within the bund. This bund will be extended by 80$m^2$ for the installation of two new storage tanks proposed for 2021. An additional 210$m^2$ secondary containment slab for the mixing units, 25$m^2$ secondary containment slab for pumps and 25$m^2$ secondary containment slab for additive unloading slab will result in a net increase in the stormwater catchment area just over 1000 $m^2$. The new concrete slab containment areas will be designed and constructed to drain to collection sumps which material can either be recovered from or are connected via a valve and underground pipeline to the OWS for treatment.

The OWS tank contains an immersed dipped inlet pipe to extinguish flames and an automatic closure device to activate treatment. The OWS treatment capacity is 40 $m^3$/h. The OWS provides hydrocarbon treatment such that treated water is less than 10 ppm TRH. The treated wastewater from the OWS is then discharged to an infiltration trench located 150m from the bitumen bunds and storage areas (Figure 1).

Other infrastructure such as hot oil heaters, heat exchange unit, transfer pumps and road tankers loading areas are under cover with concrete flooring. Existing areas where the pumps and hot oil heater etc. are housed is measured approximately 28m x 16m or 448$m^2$. This area is contained by kerbing around it that is approximately 100mm high with the containment capacity of approximately 44$m^3$. If any bitumen is spilled in this area, it will be contained within the area and drain towards the blind sump in one corner which is a small pit <1$m^3$. Any spills in the roofed areas are cleaned and captured in a blind sump. Spilled materials are recovered from the blind sumps and/ or recycled back to the mixing unit or disposed via a controlled waste carrier.

### 3.5.3 Waste gases and odour management (air emission)

Keeping the bitumen viscous requires for it to be heated. Heating the bitumen and blending the bitumen with other products causes fumes that can lead to a reduced ambient air quality. The main pollutants of concern are volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and hydrogen sulphide ($H_2S$).

In order to manage potential emissions, the Applicant has proposed to install a fume scrubbing system comprising two activated carbon scrubber units.

Each unit will consist of an extraction fan, a stainless steel fume treatment chamber and a ‘knockout pot’. Fumes potentially containing contaminants such as VOCs, PAHs and particulates will pass through the scrubbing system via a ‘knockout pot’. The knockout pot is designed to separate /and or atomise particles from the gas stream at optimum vapour velocity. The atomised liquid condenses to the bottom of the pot and vapours are then piped to the fume treatment chamber. The fume treatment chamber contains a carbon filter bed which is designed to adsorb the pollutants/odour from the gas stream. The fumes will enter the treatment chamber from the top and are drawn down to the carbon bed for adsorption. Following the removal of contaminants, the treated vapours are drawn by a fan to the atmosphere from a 4m high stack. Any drained condensate waste from the knock out pot will be placed into a 1000L intermediate bulk container (IBC). The IBC waste will be collected by an approved and licensed waste carrier and disposed to a licensed disposal site.

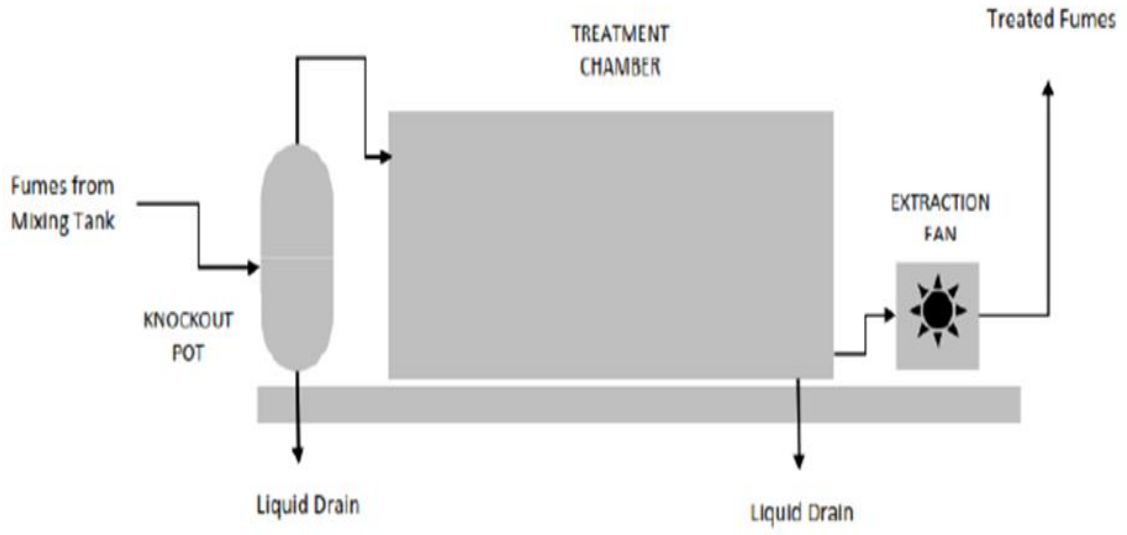



**Figure 5: Activated carbon scrubbing system**

## 3.6 Exclusions to the Premises

As mentioned in Section 3.1, part of the lot is utilised by a separate entity, the activities of which are excluded from the Premises. The Applicant's infrastructure and BSS equipment items are independent, however there are interconnecting pipelines from the BSS storage tanks to the Applicant's existing storage tanks. Some infrastructure is shared, such as the hot oil buffer storage tank and the access stair tower to the top of both sets of tanks. There is also a drainage pipeline from the BSS compound that feeds to the OWS on the Applicant's site. However the drainage to the OWS is managed by the Applicant.

# 4. Legislative context

Table 5 summarises approvals relevant to the assessment.

**Table 5: Relevant approval**

| Legislation | Licence | Holder | Approval |
|---|---|---|---|
| *Environmental Protection (Kwinana)(Atmospheric Wastes) Regulations 1992* under *Environmental Protection Act 1986* | NA | NA | The EPP applies to Kwinana air shed within Kwinana Industrial area.<br>The Applicant proposed activity falls in Area A of the EPP. |
| *Dangerous Goods Safety Act 2004* | Dangerous Goods Licence | Puma Energy (Australia) Bitumen Pty Ltd | Licence number DGS022430 |

### 4.1.1 Planning approvals

Planning approval has been granted for both stage 1 and 2 works.

### 4.1.2 Department of Mining, Industry Regulation and Safety

The Applicant has advised that an amendment application to the existing Dangerous Goods Licence has been submitted to the Department of Mines, Industry Regulation and

Safety separately to this application.

## 4.2 Part V of the EP Act

### 4.2.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements, which inform this assessment, are

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Regulatory best practice principles (September 2018)*
- *Guideline: Industry Regulation Guide to Licensing (June 2019)*
- *Guideline: Odour emissions (June 2019)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Environmental Siting (November 2016)*
- *Guideline: Decision making (June 2019)*
- *Guidance Statement: Risk Assessments (February 2017)*

Other subsidiary legislation of the EP Act which informs this assessment is the *Environmental Protection (Noise) Regulations 1997 (*Noise Regulations)*, Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992* and the *Environmental Protection (Unauthorised Discharges) Regulations 2005.*

# 5. Air quality

The Applicant has identified their main potential sources of air emissions as VOCs, PAHs and $H_2S$ from current and future operations. In December 2019, the Applicant undertook ambient air quality and odour monitoring at several locations near the boundary of the Premises to try to establish the potential impact from current operations. The monitoring did not detect any VOCs, PAHs or $H_2S$ at the boundary of the Premises.

The Applicant provided with the application a screening assessment against the Draft Guideline – Air Emissions (DWER 2019). The likely gaseous emissions from the proposed infrastructure were estimated based upon established estimation methods, such as the *National Pollutant Inventory Emission Estimation Technique Manual for Hot Mix Asphalt Manufacturing* (Environment Australia, 1999).

The screening assessment assessed the potential impact of the existing and the new infrastructure. The screening assessment concluded that at maximum production rates with the activated carbon scrubber operating the emissions to air for VOCs could be as high as 22% of the ambient ground level value (agv) for Asphalt (bitumen/petroleum) fumes (1 hour value) but with the planned production rate it would be around 10%. The maximum calculated concentration of particulates was less than 7% of the 24-hours agv at maximum production and less than 3% of the 24-hours agv at the planned production rate.

The calculated results of the screening assessment for the maximum production rate exceeded the Draft Guideline – Air Emissions' threshold of insignificance, but for the planned production rate, the calculated results were below this threshold.

The Delegated Officer has decided that a detailed modelling in this case would not be required due to the conservative nature of the screening assessment and the fact that the nearest sensitive receptors are relatively far away. The Applicant controls for air emissions are deemed adequate and should be prescribed in the Works Approval conditions.

# 6. Consultation

The application was advertised on the Department's website on 13 March 2020 and 16 March 2020 on West Australian newspaper for a 21-day comment period. A notification was also placed in the West Australian newspaper. In addition, a stakeholder letter was sent to the City of Kwinana on 12 March 2020. The Department did not receive any submissions and did not receive a response from the local authority.

# 7. Location and siting

## 7.1 Siting context

The Premises is located within the Kwinana Industrial Area (KIA). Kwinana beach recreational park is located 650m from the Premises. Kwinana Beach and Fremantle Port Bulk Jetty are located 800m south and 900m west respectively from the Premises. CSBP's Ammonium Nitrate Plant and Fertiliser Plant are located about 100m north of the Premises. Other industrial premises in the area include Macrofertil, which is located 300m south, Nickel West Refinery 300m southeast and Coogee Chemicals is 500 metres east of the Premises boundary.

## 7.2 Residential and sensitive receptors

The distances to residential and sensitive receptors are detailed in Table 6 below.

**Table 6: Receptors and distance from premises boundary**

| Sensitive Land Uses | Distance from Prescribed Activity |
|---|---|
| Wells Park – Kwinana Beach recreational park | 540 m south-west |
| East Rockingham, residential area | 2, 500 m south |
| Calista, residential area | 3,300 m east |

## 7.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 7.

The table has also been modified to align with the *Guidance Statement: Environmental Siting.*

**Table 7: Environmental values**

| Specified ecosystems | Distance from the Premises |
|---|---|
| Cockburn Sound (Indian Ocean) | 600 m west |

## 7.4 Groundwater and water sources

The site is within the Cockburn Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* while the State Environmental (Cockburn Sound) Policy boundary is approximately 545 m west of the site. The distances to groundwater and water sources are shown in Table 8. Information given in Table 8 has been sourced from the Perth Groundwater Map accessible via the department website: https://www.water.wa.gov.au/maps-and-data/maps/perth-groundwater-atlas.

**Table 8: Groundwater and water sources**

| Groundwater and water sources | Distance from Premises | Environmental value |
|---|---|---|
| Groundwater | Depth to groundwater encountered at approximately 4 m below ground level (5 m relative to AHD). | Salinity 500-1000 mg/L |

## 7.5 Soil type

The Premises is located on soil that is generally described as Safety Bay Sand (Passmore, 1967, 1970; Playford & Low, 1972). A CSIRO report to the Cockburn Sound Management Council (2006) specifies that Safety Bay Sand is visible along the coastal margin while aeolian sand dunes extends offshore into Cockburn Sound. Safety Bay Sand is primarily comprised of quartz skeletal sand, humic quartz sand (soil), calcreted sand, medium and coarse sand, shelly sand and beach rock. Due to the nature of the proposed work there is no risk to human health associated with the soil.

## 7.6 Meteorology

### 7.6.1 Wind direction and strength

Based on wind direction and speed from the Bureau of Meteorology's weather station at Medina Research Centre, morning winds are predominately east and north/south-easterly Afternoon winds are predominately southwest and westerly (Figure 6). It is important to note that this wind rose shows historical wind speed and wind direction data for Medina Research Centre and should not be used to predict future data.

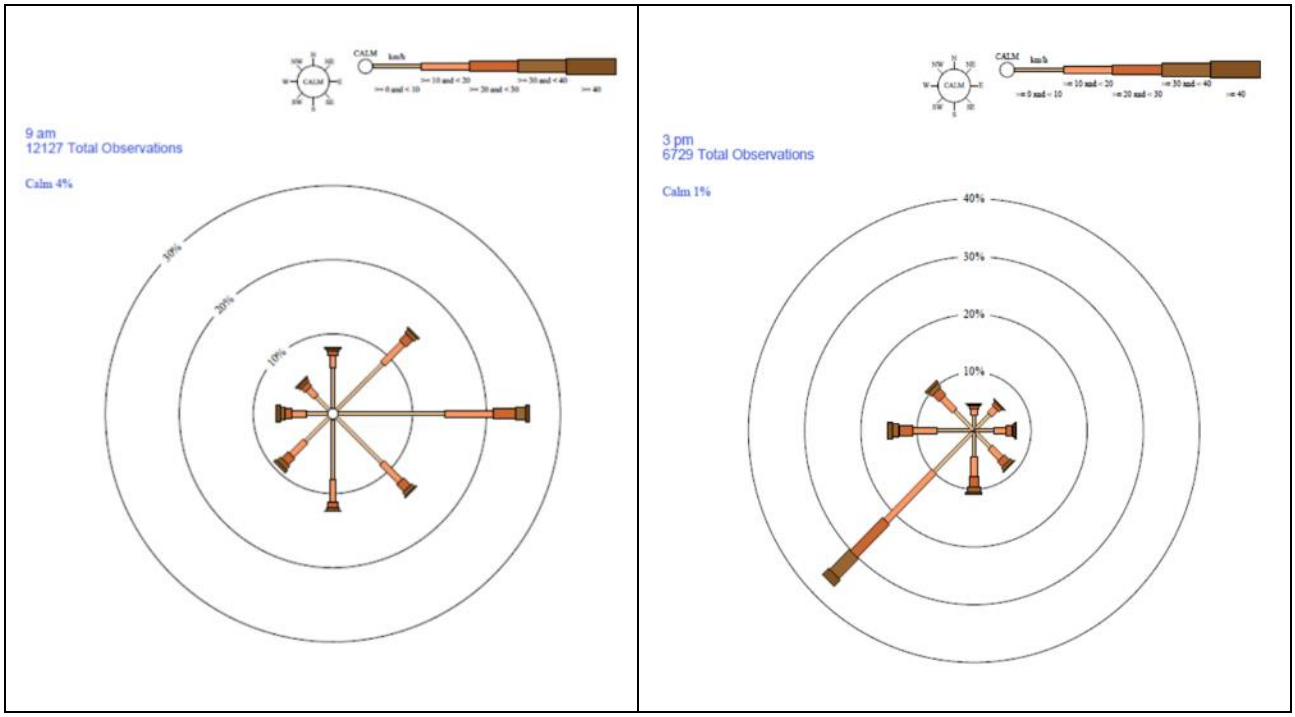



**Figure 6: Wind Roses – morning and afternoon**

# 8. Risk assessment

## 8.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event, which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor that 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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor, which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 9 and Table 10.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 9 and Table 10 below.

**Table 9: Identification of emissions, pathway and receptors during construction**

| Risk Events | | | | | | Continue to detailed risk assessment | Reasoning |
|---|---|---|---|---|---|---|---|
| **Sources/Activities** | | **Potential emissions** | **Potential receptors** | **Potential pathway** | **Potential adverse impacts** | | |
| **Construction of new mixing units, storage tanks and associated infrastructure** | Earthworks, construction, mobilisation and installation/ positioning of infrastructure | Fugitive Dust<br><br>Noise | Wells Park recreational area – Kwinana Beach approximately 540 metres south-west<br><br>Residence approximately 500 metres south-west from the Premises boundary. | Air / wind dispersion | Amenity impact | No | The Delegated Officer has considered the location of the Premises and the potential emissions from construction works. The Delegated Officer has determined that the noise and dust emissions during construction are insignificant considering the short construction period.<br><br>Additional controls/ conditions are not imposed in the issued Works Approval. The Delegated Officer determined general provision of the EP Act and *Environmental Protection (Noise) Regulations 1987* apply. |

**Table 10: Identification of emissions, pathway and receptors during commissioning and operation**

| Risk Events | | | | | | Continue to detailed risk assessment | Reasoning |
|---|---|---|---|---|---|---|---|
| Sources/Activities | | Potential emissions | Potential receptors | Potential pathway | Potential adverse impacts | | |
| **Transfer and mixing of raw materials and product** | Transfer of crumbed rubber or polymer in the mixing tank via hopper<br>Mixing of raw material inside the tanks with a continuously moving mixer<br>Pumps are used to circulate mixture and transfer material between tanks<br>Milling of mixture to further homogenise material | Noise | Wells Park recreational area – Kwinana Beach approximately 540 metres south-west | Air / wind dispersion | Amenity impact | No | The Delegated Officer has considered the noise emissions from sources arising from various activities. The Applicant monitored noise emission over a four-day period from 17-21 December 2019. The measured noise emission levels were below the acceptable noise criteria as defined in the *Environmental Protection (Noise) Regulations 1987* for the Kwinana Industrial Area.<br>The Premises is located within a heavy industrial area and the noise emissions from the Premises operation have insignificant impact when considering the cumulative noise levels in the area. Therefore, no additional noise emission conditions are imposed for the operation licence.<br>General provisions of the EP Act and *Environmental Protection (Noise) Regulations 1987* apply. |
| **CRMB/PMB Mixing unit** | Point source emissions<br>Hot fume and vapours arising from hot mixing of CRMB/PMB and bitumen in mixing tanks and<br>Mixed hot product storage tanks | Odour and gaseous emission<br>VOC (volatile organic compound)<br>PAH (poly aromatic hydrocarbons)<br>$H_2S$ (hydrogen sulfide) | Wells Park recreational area – Kwinana Beach approximately 540 metres south-west<br>Kwinana industrial park | Air / wind dispersion | Public health and amenity impact | Yes | Point source emissions are further assessed in Section 8.4 below. |

| Risk Events | | | | | | Continue to detailed risk assessment | Reasoning |
|---|---|---|---|---|---|---|---|
| Sources/Activities | | Potential emissions | Potential receptors | Potential pathway | Potential adverse impacts | | |
| **Storage and transfer of materials and products** | Bitumen storage tanks<br>Transfer of heated oil pipes and pumps<br>Additives storage tanks and transfer pipes and pumps<br>Collection of stormwater from bunded areas and secondary containment | Bitumen spills,<br>Potentially contaminated stormwater containing hydrocarbons | Cockburn Sound ~ 500 metres west. | Direct discharge to land and infiltration to groundwater | Contamination of soil, surface waters and groundwater | Yes | A detailed risk assessment of discharge of treated stormwater is provided in section 8.5 below. |

## 8.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 11 below.

**Table 11: Risk rating matrix**

| Likelihood | Consequence | | | | |
|---|---|---|---|---|---|
| | Slight | Minor | Moderate | Major | Severe |
| Almost certain | Medium | High | High | Extreme | Extreme |
| Likely | Medium | Medium | High | High | Extreme |
| Possible | Low | Medium | Medium | High | Extreme |
| Unlikely | Low | Medium | Medium | Medium | High |
| Rare | Low | Low | Medium | Medium | High |

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 12 below.

**Table 12: Risk criteria table**

| **Likelihood** | | **Consequence** | | |
|---|---|---|---|---|
| **The following criteria has been used to determine the likelihood of the Risk Event occurring.** | | **The following criteria has been used to determine the consequences of a Risk Event occurring:** | | |
| | | | **Environment** | **Public health* and amenity (such as air and water quality, noise, and odour)** |
| Almost Certain | The risk event is expected to occur in most circumstances | Severe | • **onsite impacts**: catastrophic<br>• **offsite impacts local scale**: high level or above<br>• **offsite impacts wider scale**: mid-level or above<br>• Mid to long-term or permanent impact to an area of high conservation value or special significance^<br>• Specific Consequence Criteria (for environment) are significantly exceeded | • Loss of life<br>• **Adverse health effects:** high level or ongoing medical treatment<br>• Specific Consequence Criteria (for public health) are significantly exceeded<br>• **Local scale impacts:** permanent loss of amenity |
| Likely | The risk event will probably occur in most circumstances | Major | • **onsite impacts**: high level<br>• **offsite impacts local scale**: mid-level<br>• **offsite impacts wider scale**: low level<br>• Short-term impact to an area of high conservation value or special significance^<br>• Specific Consequence Criteria (for environment) are exceeded | • **Adverse health effects:** mid-level or frequent medical treatment<br>• Specific Consequence Criteria (for public health) are exceeded<br>• **Local scale impacts**: high level impact to amenity |
| Possible | The risk event could occur at some time | Moderate | • **onsite impacts**: mid-level<br>• **offsite impacts local scale**: low level<br>• **offsite impacts wider scale**: minimal<br>• Specific Consequence Criteria (for environment) are at risk of not being met | • **Adverse health effects:** low level or occasional medical treatment<br>• Specific Consequence Criteria (for public health) are at risk of not being met<br>• **Local scale impacts:** mid-level impact to amenity |
| Unlikely | The risk event will probably not occur in most circumstances | Minor | • **onsite impacts**: low level<br>• **offsite impacts local scale**: minimal<br>• **offsite impacts wider scale**: not detectable<br>• Specific Consequence Criteria (for environment) likely to be met | • Specific Consequence Criteria (for public health) are likely to be met<br>• **Local scale impacts:** low level impact to amenity |
| Rare | The risk event may only occur in exceptional circumstances | Slight | • **onsite impact**: minimal<br>• Specific Consequence Criteria (for environment) met | • **Local scale**: minimal to amenity<br>• Specific Consequence Criteria (for public health) met |

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*
* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*
**"**onsite**"** means within the Prescribed Premises boundary.

## 8.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment Table 13 below:

**Table 13: Risk treatment table**

| Rating of Risk Event | Acceptability | Treatment |
|---|---|---|
| **Extreme** | Unacceptable. | Risk Event will not be tolerated. DWER may refuse application. |
| **High** | May be acceptable.<br>Subject to multiple regulatory controls. | Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions. |
| **Medium** | Acceptable, generally subject to regulatory controls. | Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied. |
| **Low** | Acceptable, generally not controlled. | Risk Event is acceptable and will generally not be subject to regulatory controls. |

## 8.4 Risk Assessment (during operation– Risk Event 1)

### 8.4.1 Description of Risk Event 1 – Odour/gaseous emission

Air emissions from bitumen mixing tanks and storage tanks causing odour and gaseous emissions potentially dispersing by air and wind. The emissions have the potential to impact the Wells Park users located about 540m from the Premises.

### 8.4.2 Identification and general characterisation of emission

Bitumen also known as asphalt is a by-product of crude oil/petroleum refinery. It is a sticky, black, and highly viscous liquid or semi-solid and used in road construction.

Bitumen when heated and mixed with other materials such as CRM and PM at higher temperatures could release unpleasant odour in the form of $H_2S$ (hydrogen sulfide) and gas emissions containing VOCs, PAHs, and particulates.

At a full production capacity with no fume/vapour scrubbing treatment, the storage tanks and the bitumen mixing units will produce 0.0059g/s VOC and 0.03g/s $PM_{10}$.

### 8.4.3 Description of potential adverse impact from the emission

The department considers air emissions in relation to their potential impact on amenity air quality and the environment.

Potential impacts from stack emissions include reduced local air quality, cause nuisance, and amenity impacts on the nearest recreational receptors.

### 8.4.4 Criteria for assessment

Potential emissions from bitumen manufacturing are of $H_2S$, VOC and PAH collectively and particulate matter. General provisions of the EP Act make it an offence to cause or allow

pollution, including odour that unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person.

The assessment criteria for ambient air quality standards are detailed in the NEPM (and are shown in Table 14 below.

**Table 14: Ambient air quality standards**

| Pollutant | Averaging period | Maximum concertation |
|---|---|---|
| [1]Particulates as $PM_{10}$ | 1 day | 50µg/$m^3$ |
| | 1 year | 25µg/$m^3$ |
| [2]Asphalt (bitumen / petroleum) fumes | 1 hour | 9µg/$m^3$ |

Note 1: NEMP standards
Note 2: DWER – Guideline: air emissions (Draft)

DWER also considers a number of factors when assessing air emissions. This includes cumulative impact, presence of receptors, existence of air quality issues or complaints and the operator's compliance history.

### 8.4.5 Applicant's controls – air emission

To mitigate potential adverse impact of air emission from stacks the Applicant has proposed to install a fume/vapour extraction and scrubbing system.

This assessment has reviewed the controls set out in Table 15 below.

**Table 15: Applicant's proposed controls for Risk Event 1 – air emission**

| Emission source | Controls | Operational controls |
|---|---|---|
| CRM/PM Bitumen mixing units and bitumen storage tanks | Two fume scrubbing system equipped with carbon filter medium designed to chemically adsorb the pollutants/ odour from the fume stream<br><br>Automatic temperature controls which regulates the temperature of bitumen in the tanks<br><br>Testing, sampling and monitoring of stacks from mixing unit and existing storage tanks and performance evaluation of activated carbon scrubber unit during stage one commissioning in 2020<br><br>Testing, sampling and monitoring of stacks from mixing unit and existing storage tanks and the | Mixing tanks are connected to activated carbon scrubber for fume/vapour treatment<br><br>Air emissions from the mixing units are treated in the two fume treatment chambers containing carbon filter medium to absorb vapour/fumes contaminants<br><br>Treated vapours/fume from the activated carbon scrubber units exit via 4metre high stack<br><br>When installed in 2021, the two mixed bitumen storage tanks will be connected to the activated carbon scrubber treatment system.<br><br>Operator to observe and note odour near the activated carbon scrubber systems and record it daily in the Premises internal log books<br><br>Draining and removal of condensate from the knockout pot will be undertaken when the units are in operation<br><br>Regular maintenance and performance control of equipment<br><br>Monitoring of airflow across carbon bed for pressure difference initially is at a 20% increase in |

| Emission source | Controls | Operational controls |
|---|---|---|
| | additional two new storage tanks as well as performance evaluation of activated carbon scrubber unit during stage two commissioning in 2021 | the pressure drop across the filter bed. This will change after operational experiences.<br>Record, investigate and respond to complaints for odour/gas |

### 8.4.6 Consequence

The Delegated Officer considered the proposed production rate, and operational controls for air emissions from the Premises. It is determined that the environmental air quality criteria will be met. Therefore, the Delegated Officer considers the consequence to be ***Slight.***

### 8.4.7 Likelihood of Risk Event

Based upon the Applicant's proposed controls and regulatory controls, the Delegated Officer has determined that the likelihood of impacts to public health and amenity will only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood to be ***Rare***.

### 8.4.8 Overall rating of Risk Event 1 – Air emission

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk-rating matrix (Table 12) and determined that the overall rating for the risk of point source emissions during normal operations is ***Low***.

## 8.5 Risk Assessment (during operation) – Risk Event 2

### 8.5.1 Description of Risk Event 2 – Discharge to land

Discharge of potentially contaminated stormwater containing hydrocarbons to land can cause contamination of soil and groundwater which could impact the nearby marine environment of Cockburn Sound.

### 8.5.2 Identification and general characterisation of Risk Event 2

Spills of hydrocarbon products such as hot oil from the pipes and pumps have the potential to contaminate stormwater in the bunded areas. When exposed to weather and mixed with stormwater at ambient temperature; the hydrocarbons have the potential to break down overtime and contaminate soil and water, including groundwater.

### 8.5.3 Criteria for assessment

The receptors identified for this risk event are soil, groundwater and the marine environment of Cockburn Sound. The *National Environment Protection (Assessment of Site Contamination) Measure 1999* provides guidance on appropriate assessment criteria for site contamination (land and groundwater); and the *Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (99% level of protection)* also provide relevant assessment criteria to assess the risks associated with the discharges to groundwater, given the proximity of the inshore marine environment.

Department's WQPN No. 68 (Mechanical equipment wash down) specifies that treated effluent quality from an oil separator, measured as total petroleum hydrocarbons should not exceed 15 mg/L.

Consideration has been given to the Premises location and siting as discussed in Section 7 as well as the Applicant's existing operations on site; the Delegated Officer has determined that the discharge of hydrocarbons from the OWS should not exceed 10 mg/L TRH. The 10 mg/L concentration limit is consistent with other industries in the vicinity, for example, SAMI Bitumen Technologies.

### 8.5.4 Applicant controls

The Applicant listed the following controls to address the risk associated with the discharge of potentially contaminated stormwater containing hydrocarbons to the environment:

- hot bitumen storage tanks and CRMB/PMB mixing unit areas are within bunded areas,
- potentially contaminated stormwater from within the bunded areas is discharged through an oily water separator (OWS) to remove hydrocarbons;
- the OWS treatment is capable of treating up to 40 $m^3$/h from the 900$m^2$ catchment area including the bitumen mixing units, storage tanks, pipes, pumps and activated carbon scrubber units;
- hot bitumen storage tanks are equipped with high level alarms and overfill protection to protect against the risk of hot bitumen overflow
- the discharge from the OWS will be sampled and anlaysed prior to discharge to the infiltration trench to verify it meets a discharge criteria of less than 10 mg/L TRH;
- hydrocarbon spill management kits are placed strategically on site;
- staff and operators are trained in spill management and hydrocarbon emergencies;
- raw material bags such a crumbed rubbers/polymers are stored indoors with roof overhead and on hardstand and the raw material storage area is equipped with firefighting equipment should there be a fire emergency;
- hardstand areas including bunds and the kerbed concrete areas are designed to capture spills and either drain to a blind sump for recovery or to the OWS via an isolation valve and underground pipeline for treatment; and
- spills are cleaned and any solid wastes generated from spills are contained and removed offsite by a licensed controlled waste carrier, or recycled back into the system where deemed suitable.

### 8.5.5 Consequences

In consideration of the location and nature of the operation; spill or leak of hydrocarbons from material storage, handling or transfer, or from equipment failure would have a low level impact on-site and a minimal impact off-site at a local scale. The Delegated Officer has determined that the consequence of spills from the Premises during operation to be ***Minor.***

### 8.5.6 Likelihood of risk event 2

The Applicant has proposed controls which includes cleaning and housekeeping of hydrocarbon spills and treatment of potentially contaminated stormwater as well as spills via OWS from bunded areas. Activities are undertaken in bunded areas where handling/storage and transfer of materials occurs.

Therefore the Delegated Officer has determined that contamination of soils and groundwater due to discharge of potentially contaminated stormwater will not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood risk event to be ***Unlikely.***

### 8.5.7 Overall rating of risk even 2

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 12) and determined that the overall rating is ***Medium***.

## 8.6 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 16 below. Controls are described further in Section 9.

**Table 16: Risk assessment summary**

| | **Description of Risk Event** | | | **Applicant controls** | **Risk rating** | **Acceptability with controls (conditions on instrument)** |
|---|---|---|---|---|---|---|
| | **Emission** | **Source** | **Pathway/ Receptor (Impact)** | | | |
| 1. | Air emissions<br>Particulates, VOCs | Bitumen mixing units and storage via stacks | Air/wind impacting amenity and health from inhalation | Refer to section 8.4 above | Slight consequence<br>Rare<br>**Low risk** | Acceptable subject to Applicant's controls conditioned with outcomes based regulatory controls |
| 2. | Discharge to land (potentially contaminated water) | Bitumen storage and handling bunded areas via OWS | Direct discharge of stormwater to land and infiltration to groundwater which may reach the marine environment causing impacts on water quality and aquatic organisms. | Infrastructure and management controls.<br>Refer to section 8.5 and 8.5.4 | Minor consequence<br>Unlikely<br>**Medium risk** | Acceptable subject to Applicant's controls conditioned with outcomes based regulatory controls |

# 9. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 19. The risks are set out in the assessment in Section 8 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Works Approval will be set to give effect to the determined regulatory controls.

**Table 17: Summary of regulatory controls to be applied**

| | | Controls (references are to sections below, setting out details of controls) | | |
|---|---|---|---|---|
| | | 8.4 and 8.5 Infrastructure and equipment | 8.4.5 and 8.5.4 8.4.5Specified action | 8.4.4 and 8.5.3 Emission limits (monitoring and reporting) |
| Risk Items (see risk analysis in section 8.6) | 1. Point source emission (air emission) from infrastructure | ● | ● | ● |
| | 2. Point source emissions to land (during operation) | ● | ● | ● |

## 9.1 Works Approval controls – construction/operation

### 9.1.1 Infrastructure and equipment (design)

The works approval will require the bitumen mixing units and associated equipment to be equipped with air emission controls. This includes connecting bitumen mixing units and the two new storage tanks to the activated carbon scrubber systems and discharge of treated vapours via 4m stacks.

The Works Approval will require the mixing units, storage tanks and associated infrastructure (pumps etc.) to be installed within secondary containment areas which drain spills and collected stormwater to a blind sump and/ or the OWS.

**Grounds:** The infrastructure and equipment will be suitably designed and constructed to minimise the risk of air emissions and discharge to land.

### 9.1.2 Infrastructure requirements during time limited operations

Requirements for the operation of infrastructure and equipment during time limited operations consistent with the outcomes of design and installation of infrastructure requirements.

**Grounds:** Requirements reflect Applicant controls and relate to the risk derived outcomes of requirements for the design and construction of infrastructure and equipment.

### 9.1.3 Point source emission (PM, VOCs & Odour)

The following requirements will be included in the works approval as construction and operational requirements:

- the Applicant will be required to ensure the proposed activated carbon scrubber systems meet specified design and construction requirements to remove process gases;
- ensuring that the bitumen fume is going through the activated carbon scrubber treatment prior to release;
- filtered air (from the activated carbon scrubbers system) is released to atmosphere through a 4m (agl) stack;
- liquid bitumen is stored in the four existing storage tanks;
- the two new mixed CRMB and PMB storage tanks will be connected to the activated carbon scrubber systems for air emissions treatment;
- vents for displaced air connected to '*knockout pot*' for vapour recovery and activated carbon scrubbers
- raw materials e.g. crumbed rubber and polymers are stored in up to 1000kg bags in an enclosed shed; and
- stack testing will be carried out to establish baseline emission concentrations. The load capacity and the highest emission concentration will be determined at this point. The baseline emission concentrations will then be used to determine future licence controls for emissions if required.

**Grounds:** Infrastructure and equipment will established and operated to minimise the risk of air emissions impacting amenity or public health.

### 9.1.4 Specified actions during time limited operation phase for air emissions

Requirement to submit a report on air emissions monitoring specified in the works approval including the sample analysis report and verification of emissions concentration from the stacks.

The following monitoring requirements are required during time limited operation:

- ensure that the air emission sampling locations comply with *Australian Standard AS 4323.1-1995 Stationary Source Emissions – Selection of Sampling Position*;
- ensure that the air emissions stack testing and monitoring complies with relevent *USEPA Standards.*

**Table 18: Stack testing and monitoring requirements**

| Emission discharge point (Map ref Map 1B) | Parameter | Units | Sampling method/s | Frequency |
|---|---|---|---|---|
| L1<br>L2 | Stack flow rate | $m^3$/min | USEPA Method 2 | A minimum of twice during time limited operations:<br>Once within eight weeks of commencing time limited operations<br>and<br>Once within six months of commencing time limited operations<br>Annual test during Operation under the |
| | Stack velocity | m/sec | USEPA Method 2 | |
| | Total VOCs<br>PAHs | g/s | USEPA Method 18 | |
| | Particulates (PM) | mg/$m^3$ | USEPA Method 5 or 17 | |
| | $H_2S$ | mg/$m^3$ | USEPA Method 11 | |

| Emission discharge point (Map ref Map 1B) | Parameter | Units | Sampling method/s | Frequency |
|---|---|---|---|---|
| | | | | future Licence |

**Grounds:** Stack monitoring will be required in the works approval and future licence conditions. Stack monitoring will determine the emission reduction capability of the activated carbon scrubbers is maintained. The licence will require ongoing monitoring of PM, $H_2S$ and VOCs emissions for the asphalt mixing units and the storage tanks. The monitoring will be required on an annual basis to ensure that the emissions are controlled and the activated carbon scrubber systems are operating as required.

### 9.1.5 Stormwater infrastructure and treatment (construction and operation – emission to land)

The following environmental controls, infrastructure and equipment are required for contaminated stormwater:

- construction of a new 210m$^2$ kerbed concrete slab for the mixing units, a 25 m$^2$ concrete slab for the bitumen pumps, which include drainage to ensure that contaminated stormwater and spills are contained and directed to OWS;
- expansion of the existing storage tanks bunded area by 80m$^2$;
- treatment of potentially contaminated water via an OWS prior to discharge to land (infiltration trench); and
- the oily water separator is required to achieve TRH concentration of 10 mg/L or less prior to discharge to infiltration trench.

**Grounds:** Construction and expansion of containment areas where bitumen and hydrocarbons are stored or handled will minimise the risk of discharge of hydrocarbons beyond containment infrastructure and into the environment. The containment infrastructure are constructed and designed to contain spills and stormwater. The risk of emission to land from the OWS discharge point is medium. Monitoring of treated water from the OWS discharge point will determine water quality.

## 10. Determination of Licence conditions

The conditions in the Works Approval in Attachment 1 have been determined in accordance with the Guidance Statement: Setting Conditions.

Final determination of licence controls will consider information submitted by the Applicant in its licence application and in response to works approval requirements. The determined controls for a licence will be generally consistent with the time limited operation conditions included in the works approval together with additional reporting requirements. Proposed licence conditions will be based on Sections 8.4 and 8.5 of this decision report and as follows:

- operation of infrastructure and equipment;
- authorised discharge point/s (activated carbon scrubber stacks and OWS discharge);
- annual testing and monitoring of air emissions;
- emission limit/s on discharge to land (infiltration trench);
- storage of crumbed rubber and polymer in bags
- annual reporting;

- notification of limit exceedances; and
- records keeping.

# 11. Determination of issued Works Approval conditions

Table 21 provides a summary of the conditions to be applied to this Works Approval.

**Table 19 : Summary of conditions in the issued Works Approval**

| Condition Ref | Grounds |
|---|---|
| Infrastructure and Equipment condition 1 | A valid, risk-based condition to ensure that infrastructure is constructed as proposed in the works approval application. |
| Compliance Reporting Conditions 2 and 3 | These conditions are valid, risk-based and enable environmental compliance with the requirements of construction of infrastructure. |
| Time limited operation phase: Commencement and duration Conditions 4, and 5 | These conditions are valid, risk-based conditions and enables flexibility during construction and commencement of operation. |
| Time limited operations Infrastructure Condition 6 | The condition is a valid, risk-based and contain appropriate controls to authorise operation of infrastructure, until a licence is issued. |
| Time limited operation – monitoring and limits Conditions 7, 8, 9, 10, 11 and 12 | These conditions are valid and risk based conditions to authorise emissions subject controls and compliance monitoring, until a licence is issued. |
| Time limited operations – reporting Conditions 13 and 14 | These conditions are valid risk based conditions to ensure that authorised operation and monitoring of emissions during transitions from works approval to licence. |
| Records and reporting information Conditions 15, 16 and 17 | These conditions are valid and are necessary for administration and reporting requirements to ensure compliance. |

The Delegated Officer notes that DWER may review the appropriateness and adequacy of controls at any time and that, following a review, may initiate amendments to the works approval under the EP Act.

# 12. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 26 June 2020. The Applicant Holder provided comments on 30 June 2020, which are summarised, along with DWER's response, in Appendix 2.

# 13. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

**Amine Callegari**
**A/Manager Process Industries**
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

# Appendix 1: Key documents

| | Document title | In text ref | Availability |
|---|---|---|---|
| 1. | Works Approval W6349/2020–1 – Puma Energy (Australia) Bitumen Pty Ltd | W6349/2020/1 | accessed at www.dwer.wa.gov.au |
| 2. | *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999 and Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992* | KIA | accessed at www.epa.wa.gov.au/ |
| 3. | Guidance Statement: Risk Assessments (February 2017), Perth. | DER 2017 | accessed at www.dwer.wa.gov.au |
| 4. | Guideline: Decision Making (June 2019), Department of Water and Environmental Regulation, Perth. | DWER 2019 | |
| 5. | Guidance Statement: Environmental Siting (November 2016). Department of Environment Regulation, Perth. | DER 2016 | |
| 6. | Guidance Statement: Setting Conditions (October 2015). Department of Environment Regulation, Perth. | DER2015 | |

# Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

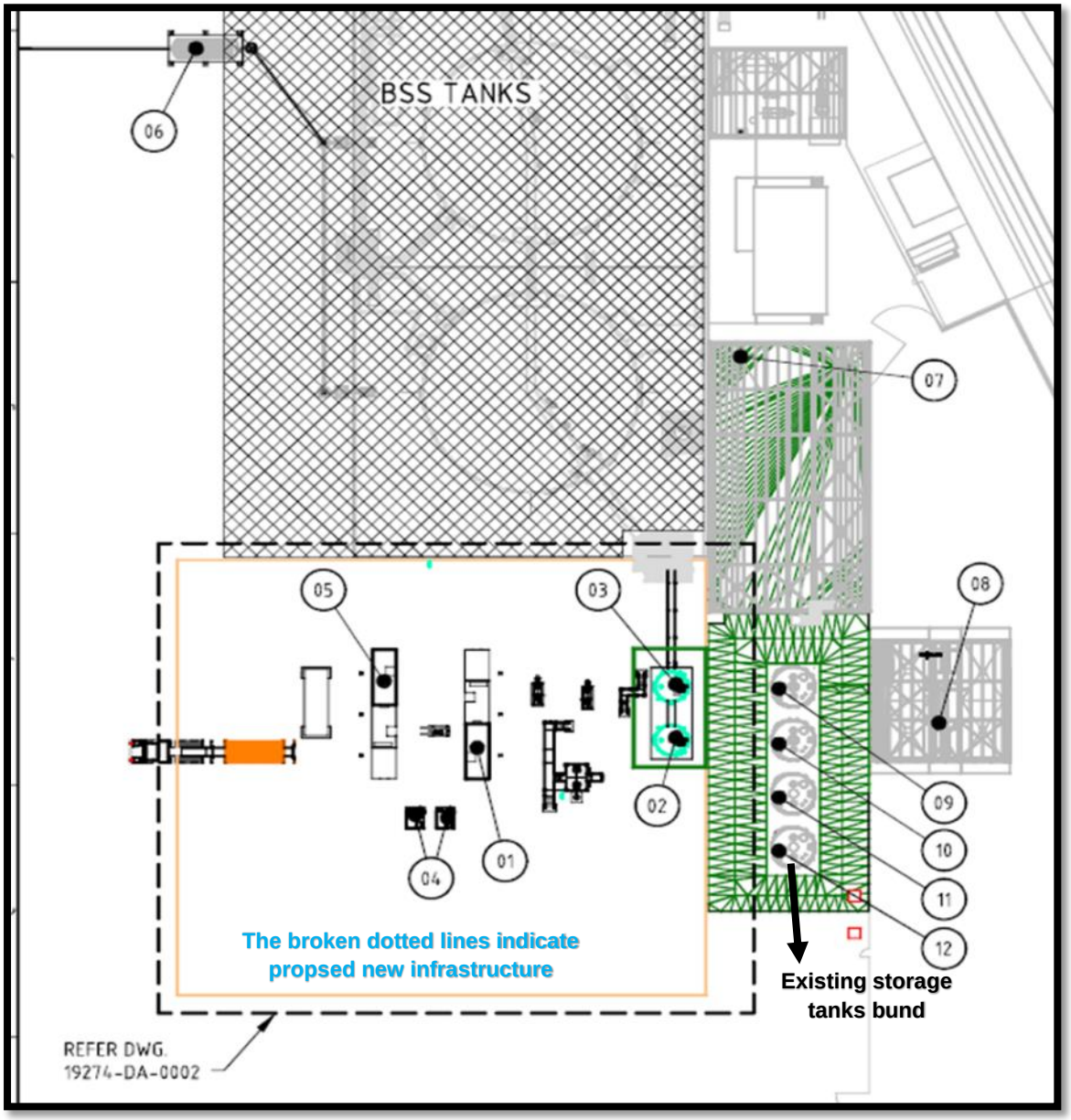
| Decision Report (DR) and Works Approval (WA) | Summary of Applicant's comment | DWER response |
|---|---|---|
| DR – section 2 paragraph three | Removed references '*to pipe works to connect four existing storage tank emission points to the activated carbon scrubber systems'* for the existing four bitumen storage tanks<br><br>The applicant advised that it is economically not viable to connect the existing bitumen storage tanks to scrubber system. In addition, the existing bitumen tanks will not be used for the storage of CRMB or PMB. Therefore the risk of VOC and $H_2S$ emissions is insignificant and it is demonstrated in the air assessment report of December 2019. | The Delegated Officer considered and accepted the changes proposed by the Applicant and they included clarifications and corrections of information in the application which do not change the risk profile of the proposed construction or operation of the premises infrastructure. Changes were made throughout the document accordingly. Additionally the works approval conditions (condition 1 and condition 6) were amended to reflect clarifications and changes to containment infrastructure sizes and drainage strategies |
| DR – section 3.1 | bitumen storage tanks – tank 103, tank 104, tank 105 and tank 106 are 250T not 100T | |
| DR – Table 4 | Both CRMB and PMB mixing units are connected to scrubber system for emission controls | |
| | Only two existing bitumen storage tanks TK-103 and TK -104 will have stirrers installed in 2020. The other two will have stirrers installed in 2021. | |
| | Additive storage tank capacity has changed from 55kL to 70kL | |
| | Additional containment in a form of sump is constructed around the scrubber to drain condensates from the knockout pot | |
| | The concrete containment slab for the mixing units will be 210$m^2$ not 260$m^2$. | |
| DR – Table 4 | Tanks ids were changed from TK-107 to TK-103 and TK-108 to TK- 104 | |
| | Bunds and containment infrastructures will be constructed in accordance with AS 1940 | |

| Decision Report (DR) and Works Approval (WA) | Summary of Applicant's comment | DWER response |
|---|---|---|
| DR – section 3.4 | Removed reference to *bitumen mixing* to fume scrubber unit | |
| DR – section 3.5 | Removed reference to par day to per batch in the sentence<br>*Each mixing unit is capable of producing 25 tonnes per batch.* | |
| DR – section 3.5.2 | Additional containments have increased the OWS catchment treatment is from 900m$^2$ to now just over a 1000m$^2$. | |
| DR – section 3.5.3 | A fume scrubbing system on bitumen mixing tanks will consist of an extraction fans – i.e. one extraction fan not two | |
| DR – section 3.6 | The Applicant receives bitumen from BSS Joint Venture bitumen storage tanks. These storage tanks are fully bunded and a drainage pipeline from the BSS compound feeds to the OWS for stormwater treatment. | |
| DR – section 5 | The Applicant confirmed that the air emission screening assessment assed existing and proposed new infrastructure. | |
| DR – section 8.4.5 – Table 15 | Automatic temperature controls on the hot bitumen tanks regulate the temperature of the bitumen.<br>Draining of knockout pot during operation scenario | |
| DR – section 8.5.4 | recommended replacing 'overflow stop switch' with 'overfill protection'<br>recommended replacing 'overflow alarms' with 'high level alarms and overfill protection' for bitumen storage tanks | |
| DR – section 9.1 | recommend some additional clarifications for the installation of stirrers in two existing storage tanks at this stage<br>The other two existing storage tanks are scheduled for stirrer installation in 2021 | |
| DR – Table 18<br>WA – condition 8 | Requested to reduce monitoring event to only twice during the time limited operation and then once per annual period<br>On 1 July 2020, the Applicant confirmed that monitoring frequency during construction and time-limited operation are appropriate. The results from these two monitoring events and the throughput information will help to determine both the air emission concentrations and the required frequency for future monitoring events. | The Delegated Officer considered and accepted the changes proposed by the Applicant as it was sufficiently demonstrated that two monitoring events will adequately characterise the emissions. |

| Decision Report (DR) and Works Approval (WA) | Summary of Applicant's comment | DWER response |
|---|---|---|
| WA – condition 12 | Requested to reduce monitoring for discharge to land to annually. | The Delegated Officer considered the reduced monitoring frequency but determined that annual monitoring is not sufficient in the early stages of operation to ensure the OWS unit is being sufficiently maintained for effective operation and removal of hydrocarbons. The Delegated Officer determined the monitoring frequency could be reduced from before every discharge to monthly when a discharge occurs recognising that this frequency will be sufficient to detect potential reduced performance of the OWS. |

# Appendix 3: Premises Maps and Plans

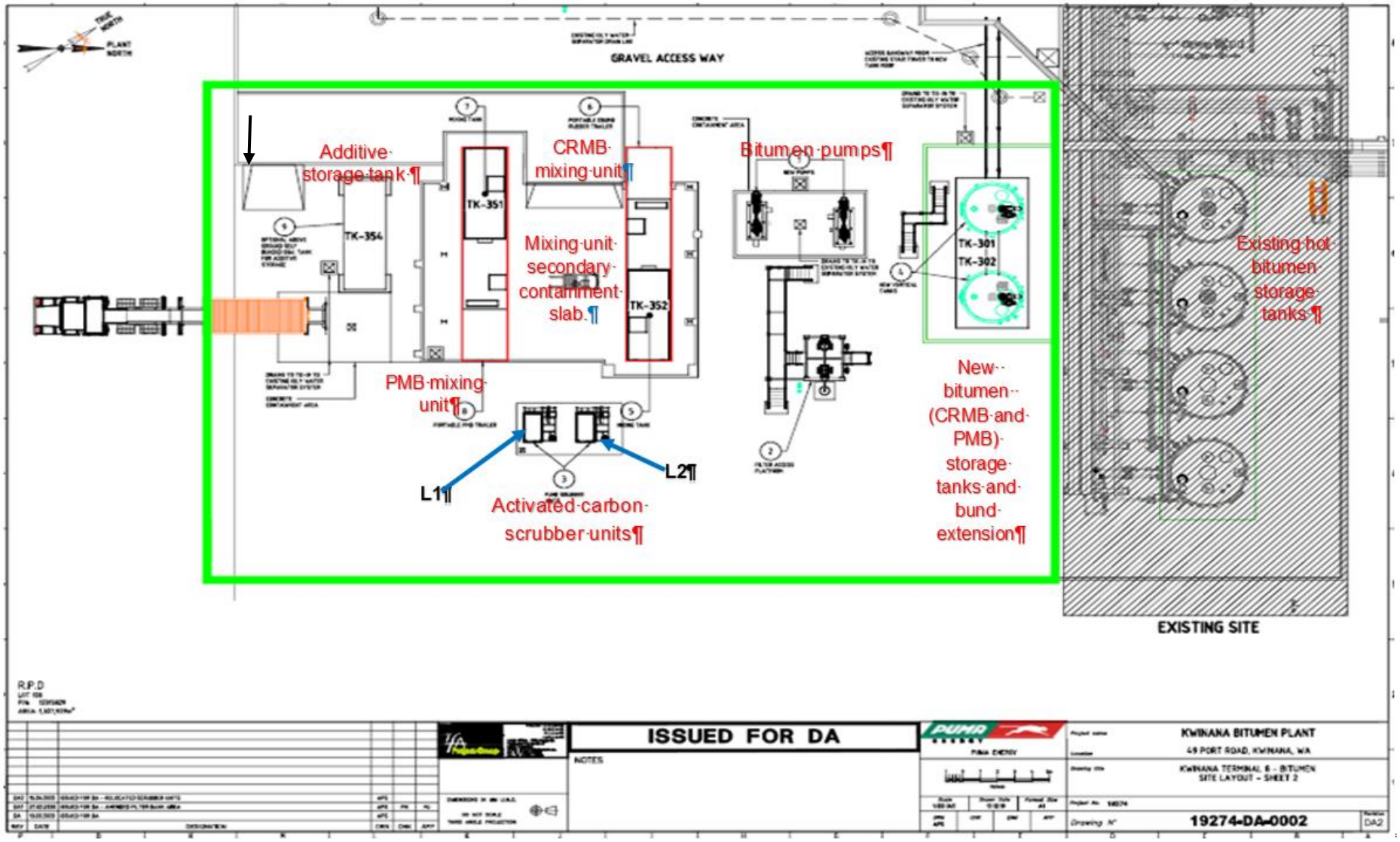
## Map 1A: Layout of infrastructure (existing and proposed)



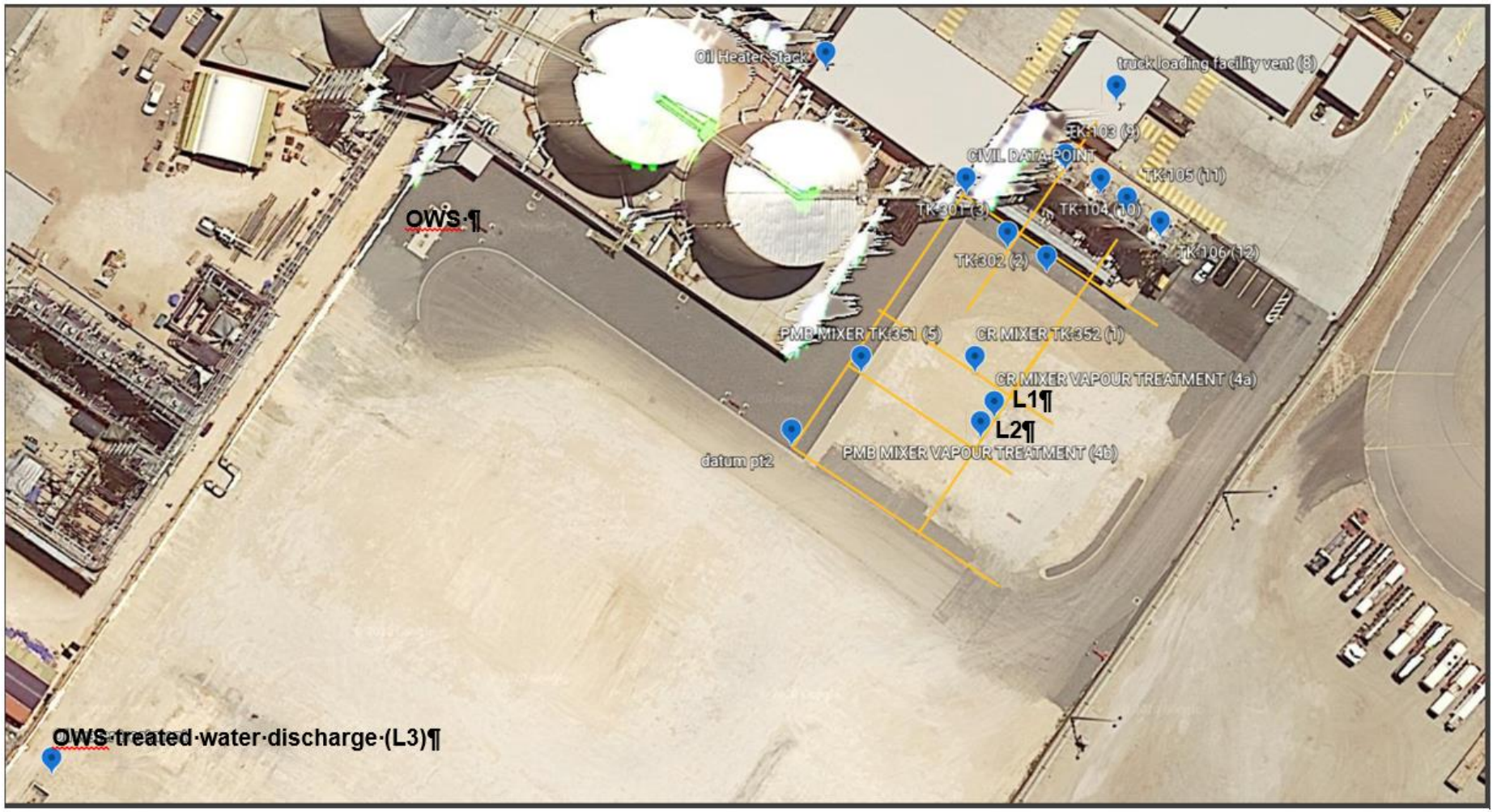

**Infrastructure reference to plan (existing and proposed)**

| No | Infrastructure | No | Infrastructure |
|---|---|---|---|
| 01 | CRMB mixer unit with a 3m vent | 07 | Oil heater stack |
| 02 | New tank – TK-301 with a 14m vent (installation 2021) | 08 | Truck loading facility with an 8m vent |
| 03 | New tank – TK-302 with a 14m vent (installation 2021) | 09 | TK-103 with a 20m vent |
| 04 | CRMB Mixer vapour treatment system with a 4m stack | 10 | TK-104 with a 20m vent |
| | PMB mixer vapour treatment system with a 4m stackt | 11 | TK-105 with a 20m vent |
| 05 | PMB Mixer | 12 | TK-106 with a 20m vent |
| 06 | Oily water separator | | |

## Map 1B: Layout of proposed infrastructure and emission points



## Map 1C: Layout of infrastructure and emission points



# Attachment 1: Issued Works Approval W6349/2020/1