



**Appeals Convenor**  
**Environmental Protection Act 1986**

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**REPORT TO THE  
MINISTER FOR ENVIRONMENT**

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**APPEAL IN OBJECTION TO THE CONDITIONS APPLIED TO A WORKS  
APPROVAL**

**WORKS APPROVAL W6090/2017/1: KWINANA MERCURY  
TREATMENT PLANT LOT 101 DONALDSON ROAD  
KWINANA BEACH**

**WORKS APPROVAL HOLDER: BMT AUSTRALIA PTY LTD**

Appeal Number 14 of 2018

**October 2018**

## Appeal Summary

This report relates to an appeal against the conditions of a works approval issued for a mercury processing plant located in the Kwinana Industrial Area, approximately 35 kilometres south of Perth. The works approval was issued by the Department of Water and Environmental Regulation (DWER).

The appellant raised a number of concerns in respect to the conditions of the works approval, which have been broadly summarised under the following grounds: spillage or leakage to ground; stack emissions; fugitive emissions from buildings; cumulative mercury emissions; risks associated with cinnabar production; and fire outbreak.

The investigation focused on the matters raised in the appeal and whether the conditions of the works approval are adequate or appropriate to prevent, control, abate or mitigate pollution or environmental harm.

The appellant also raised matters in the appeal that are not related to the conditions of the works approval but relate to either DWER's licensing process under Part V of the EP Act or other statutory approval processes. These matters are considered to be beyond the scope of the appeal, which is limited to the conditions of the works approval.

In its response to the appeal, DWER advised that the potential risks and impacts identified during its assessment of the works approval application can be adequately controlled through the requirements of the works approval. The works approval contains conditions that prohibit commissioning, specify the infrastructure to be installed, authorise general emissions during construction and records/reporting requirements.

In responding to the appeal, the works approval holder submitted that appropriate assessments have already been undertaken as part of the application for the works approval, and that any potential risks and impacts associated with the mercury processing plant can be managed through the requirements of the works approval and other statutory requirements.

Following the consideration of the issues raised in the appeal, advice from DWER and information provided by the works approval holder, it is considered that DWER has had regard for the matters raised through the appeal and has applied appropriate conditions to manage identified risks and impacts in accordance with its relevant guidelines.

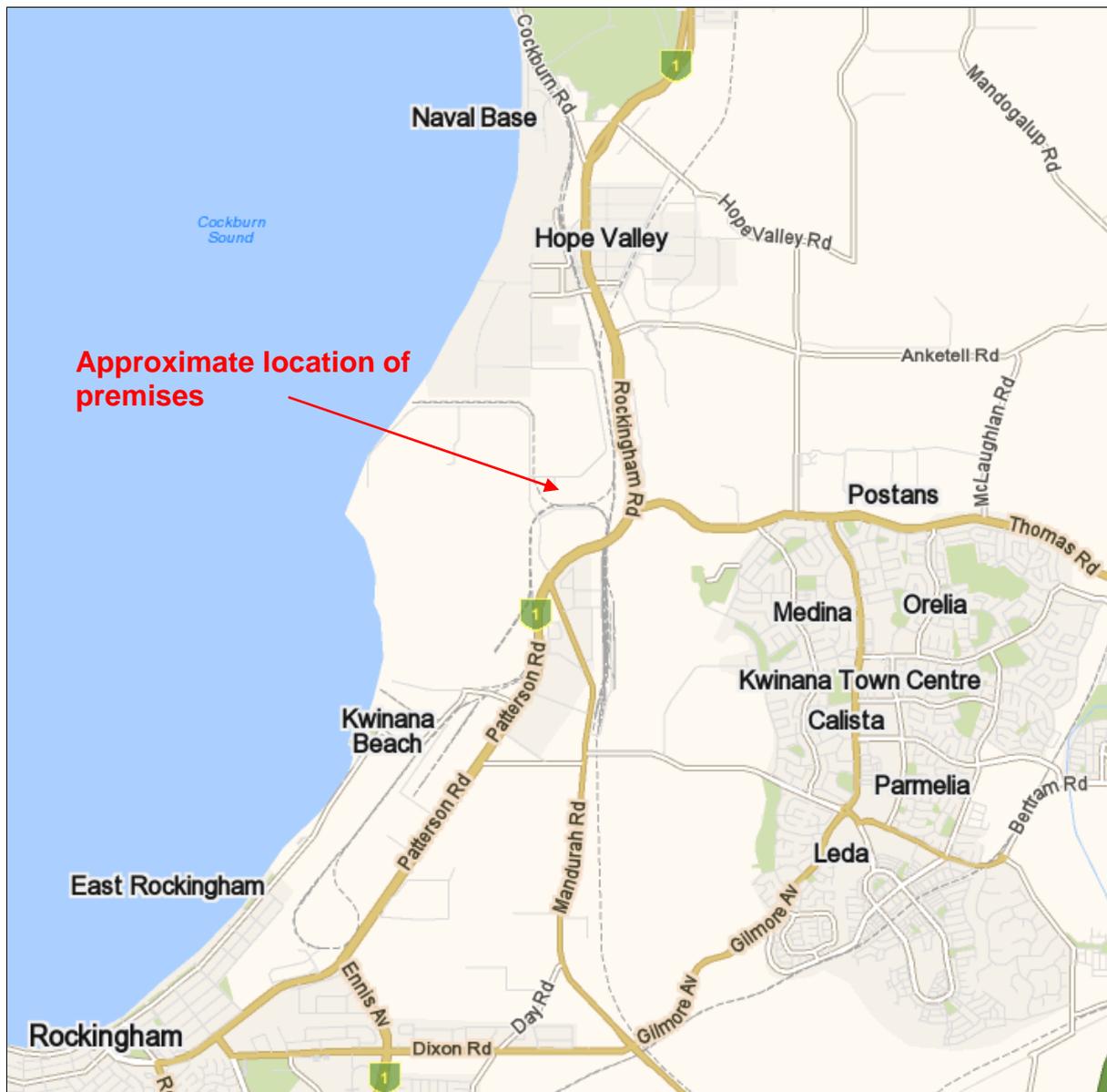
## Recommendation

It is recommended that the appeal be dismissed.

## INTRODUCTION

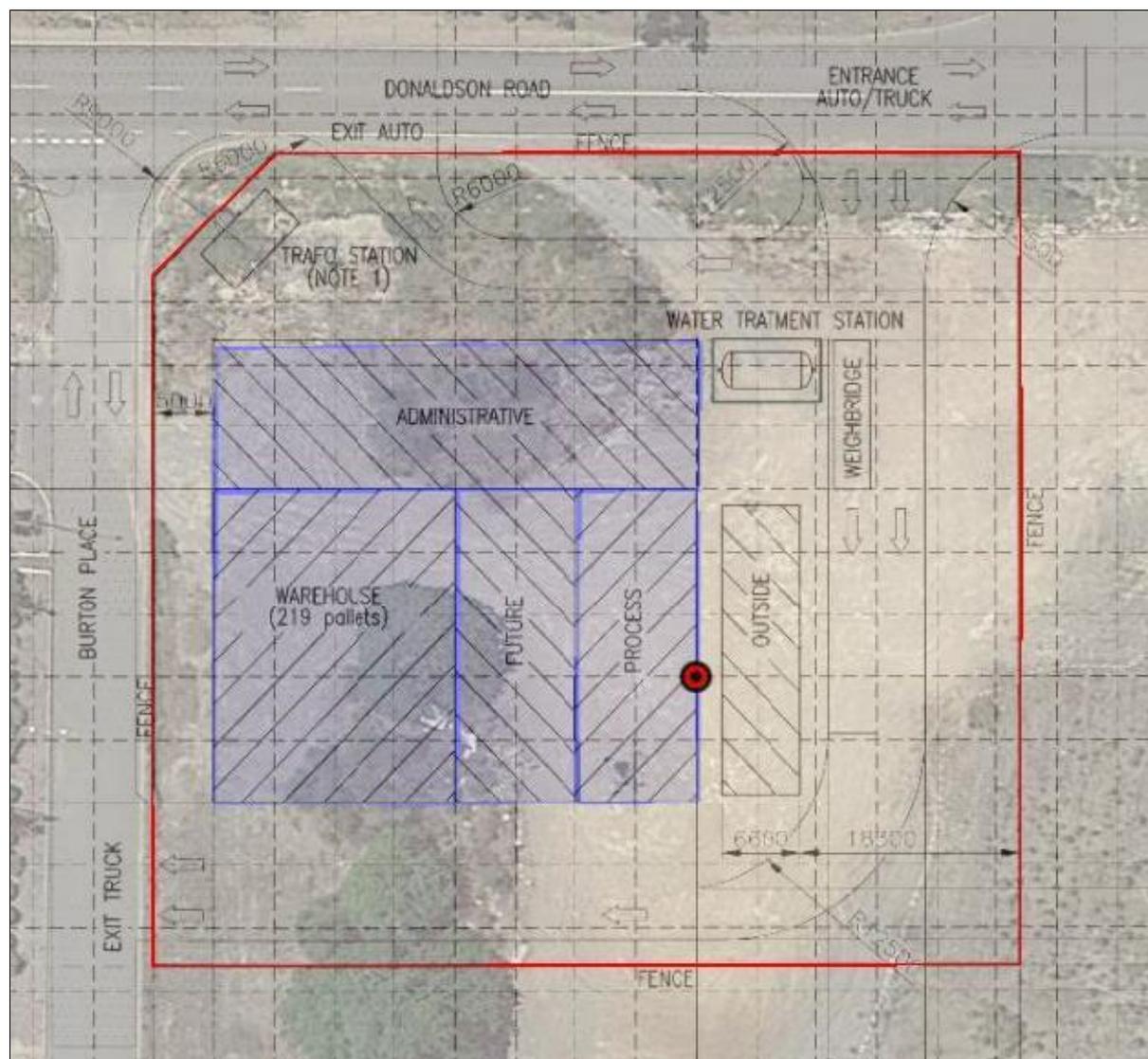
This report relates to an appeal by Contract Resources Pty Ltd (the appellant) against the conditions of Works Approval W6090/2017/1 (the works approval) issued to BMT Australia Pty Ltd (the works approval holder) by the Department of Water and Environmental Regulation (DWER) in respect to the Kwinana Mercury Treatment Plant located in the Kwinana Industrial Area, approximately 35 kilometres south of Perth. The location and site layout of the premises are shown in Figures 1 and 2 respectively.

**Figure 1 – Location of premises**



(Source: Whereis.com July 2018)

Figure 2 – Site layout of premises



— Fenceline      — Buildings      ⊕ Emission stack

(Source: Works Approval Application 26 July 2017)

DWER received an application for a works approval in August 2017, and following consideration of information provided by the applicant, DWER granted the works approval on 8 May 2018, subject to conditions. The works approval contains conditions that prohibit commissioning (Condition 1), specify the infrastructure to be installed (Conditions 2 and 3), authorise general emissions during construction (Condition 4) and records/reporting requirements (Conditions 5 and 6). It was from this decision that the appeal was lodged under section 102(3) of the *Environmental Protection Act 1986* (EP Act).

The works approval incorporates two prescribed premises categories, being Category 39 (Chemical or oil recycling) and Category 61A (Solid waste facility) as defined under Schedule 1 to the *Environmental Protection Regulations 1987* (EP Regulations).

In response to the appeal, DWER advised that the works approval holder intends to construct the facility for the treatment of up to 1,000 tonnes per year of mercury-contaminated waste (MCW) from liquefied natural gas projects in Western Australia. This will

be achieved through heating MCW in electrical furnaces to remove volatile organic compounds (VOCs) (including mercury) and condensing the volatile components into liquids. Recovered liquid mercury will be combined with sulphur in a reactor to produce stable cinnabar (mercury sulphide).

DWER also advised that the removal of mercury from Class IV or Class V MCW is proposed to result in residual waste meeting Class III criteria for disposal. The small volumes of cinnabar produced will be transferred in sealed drums to an approved facility for long-term storage. All air emissions directly from the process, and fugitive air from within the process building, will exit via a stack which includes an activated carbon filtration system.

DWER noted that the works approval only authorises the construction of infrastructure, and does not allow commissioning of the facility (i.e. the storage and processing of materials, which could cause emissions), and that its assessment of the works approval application has assessed the operation of the facility, but the works approval does not authorise it. DWER advised that, if granted, a licence will include conditions to manage any risks of emissions from the commissioning process and subsequent normal operation.

DWER also noted that infrastructure to be constructed under the works approval includes the process infrastructure (retorts for heating, process vessels, pumps, cooling package, gas cyclone, reactor) housed within a three-storey process building maintained under negative pressure with an associated heating, ventilation and air conditioning (HVAC) and activated carbon filtration system. A warehouse will be constructed adjacent to the process building for the receipt and storage of MCW. The works also include an external roofed area for the storage of liquid nitrogen, residual waste and activated carbon filters, a weighbridge, and the stormwater management system for the premises.<sup>1</sup>

This document is the Appeals Convenor's formal report to the Minister for Environment under section 109(3) of the EP Act.

## **OVERVIEW OF APPEAL PROCESS**

In accordance with section 106 of the EP Act, a report was obtained from DWER in relation to the issues raised in the appeal. The works approval holder was also given the opportunity to address the matters raised in the appeal.

During the appeal investigation the Appeals Convenor consulted with the appellant and the works approval holder in relation to issues raised in the appeal.

The environmental appeals process is a merits-based process. Appeal rights in relation to a works approval are normally against the specifications of a works approval and whether the conditions of the works approval are adequate or appropriate to control the environmental impacts of the design and construction of the plant. Issues of whether the plant operates so as to manage or abate pollution and to ensure that it operates in an environmentally acceptable manner are normally considerations of the licensing process rather than a works approval. Consistency with previous Ministerial appeal determinations is also relevant, subject to new information or evidence being presented that was not previously considered.

## **OUTCOME SOUGHT BY APPELLANT**

The appellant contended that the requirements of the works approval are inadequate and will not mitigate adverse environmental impacts resulting from the mercury treatment plant.

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<sup>1</sup> DWER, Response to the appeal, 11 July 2018, pages 1-2.

The appellant put forward a number of recommendations with respect to the conditions which are considered below.

## GROUND OF APPEAL

The appellant raised a number of concerns, which have been broadly summarised under the following grounds:

1. spillage or leakage to ground;
2. stack emissions;
3. fugitive emissions from buildings;
4. cumulative mercury emissions;
5. risks associated with cinnabar production; and
6. fire outbreak.

The appellant also raised matters that they contend are relevant to the Minister's consideration, which however do not relate to the conditions of the works approval and these matters are discussed under 'Other Matters'.

### GROUND 1: SPILLAGE OR LEAKAGE TO GROUND

The appellant contended that the works approval indicates construction of the hardstand floor should be impervious but does not specify any performance standards for impermeability. The appellant submitted that mercury is an insidious pollutant, particularly for surfaces with inherent porosity where particles can remain trapped, continually emitting mercury vapour over time. The appellant also contended that the hardstand material, thickness and surface properties should be specified according to the *Technical guidelines for the environmentally sound management of wastes consisting of, containing, or contaminated with mercury* (DoEE 2010)<sup>2</sup>. The appellant was of the view that a condition should be applied to the works approval, which specifies the level of permeability or correct standard of floor covering required within the facility.

#### Consideration

This ground of appeal relates to Condition 2 (Infrastructure and equipment), which provides that:

2. The Works Approval Holder must undertake the Works:
  - (a) for the infrastructure and equipment;
  - (b) to the requirements; and
  - (c) at the locationspecified in Table 3 of Schedule 2 (Infrastructure and equipment).

In this regard, Requirement b) (Process Building overall) in Table 3 of Schedule 2, provides (among other things) that the process building and warehouse will be:

- b) Designed and constructed to include a sealed hardstand floor which is impermeable to mercury and hydrocarbons, and ...

In relation to the appellant's contention that the hardstand material should be specified according to the *Technical guidelines for the environmentally sound management of wastes consisting of, containing, or contaminated with mercury* (DoEE 2010), it is noted the

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<sup>2</sup> Department of Environment and Energy, *Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of, Containing, or Contaminated with Mercury - 5th Draft*, 2010.

document referenced by the appellant is a 2010 draft version of the United Nations' Basel Convention, *Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds*<sup>3</sup> (2015) (the Basel Convention Technical Guidelines for MCW).

In response to this ground of appeal, the works approval holder submitted that the Basel Convention Technical Guidelines for MCW state:

158. ... The floors of storage facilities should be covered with mercury-resistant materials to prevent seepage or penetration of mercury from accidental leaks and spills...

162. ... The floors of storage facilities should be coated with an epoxy coating and be light in colour to allow the detection of mercury droplets...

It is noted that DWER's Decision Report<sup>4</sup> for the works approval includes a risk assessment for spillage or leakage to ground of solids and liquids within the facility. DWER assessed the consequence (as 'minor') and likelihood (as 'rare') of various potential risk events leading to spillage or leakage to ground of solids and liquids contaminated with mercury.

In response to this ground of appeal, DWER advised that based on the risk assessment the performance of the flooring for spill containment in the warehouse and processing building was specified in the works approval by describing the required performance outcome as 'impermeable to mercury and hydrocarbons'. DWER advised that it uses outcome-based conditions rather than more prescriptive conditions provided the same goal can be achieved, which is consistent with its published *Guidance Statement: Setting Conditions, Part V; Division 3, Environmental Protection Act 1986*<sup>5</sup> (Guidance Statement: Setting Conditions). DWER also advised that this approach allows the works approval holder to choose appropriate design solutions while also requiring evidence through compliance documentation required under Condition 6 (construction compliance document), to demonstrate that the completed works meet the works approval conditions.

DWER advised that emissions from any spilled mercury attached to the floor surface would be in the form of air emissions, and to control these vapours, key infrastructure requirements as outlined in Table 3, Schedule 2 of the works approval include the maintenance of negative pressure in the process building and filtration of air before emitting it to the environment. DWER noted that air quality within buildings and the occupational exposure of workers is not regulated through the EP Act and was not considered in its assessment. Noting the above, DWER was of the view that the controls applied through the works approval are appropriate and adequate to manage risks associated with mercury spillage.

## Conclusion

In view of DWER's advice and consistent with Guidance Statement: Setting Conditions, it is considered that the existing regulatory controls in place under the works approval are appropriate and adequate to prevent and control the risk of spillage or leakage to ground from the premises. It is therefore recommended that this ground of appeal be dismissed.

## GROUND 2: STACK EMISSIONS

The appellant raised concerns about the effectiveness of using activated carbon filters in the HVAC system to absorb any mercury vapour present in the air, and contended that sulphur or iodine impregnated activated carbon filters should be required as specified in the

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<sup>3</sup> United Nations, Basel Convention, *Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with mercury or mercury compounds*, May 2015.

<sup>4</sup> *Decision Report – Application for Works Approval W6090/2017/1*, DWER, 8 May 2018, pages 19 to 25.

<sup>5</sup> *Setting Conditions, Part V; Division 3, Environmental Protection Act 1986*, Department of Environment Regulation, October 2015.

*Technical guidelines for the environmentally sound management of wastes consisting of, containing, or contaminated with mercury* (DoEE 2010)<sup>6</sup>. The appellant also questioned the appropriateness of determining the status of filter performance based on its ability to absorb hydrogen sulphide (H<sub>2</sub>S), suggesting that there should be a direct measure for the filter's capacity to absorb mercury.

The appellant was of the view that a condition should be applied to the works approval, which specifies periodic (monthly) chemical testing to determine if mercury has penetrated through to the second stage filter and that a positive test would warrant its replacement.

### Consideration

The Decision Report<sup>7</sup> outlines that emissions of mercury, VOC's and H<sub>2</sub>S ('emissions') from the MCW treatment process ('source') enter the atmosphere via the stack of the process building ('pathway') causing potential amenity and public health impacts ('adverse impacts') on people outside the premises ('receptors'). The Decision Report<sup>8</sup> also states that the process building will be an enclosed area maintained under negative pressure by the HVAC system. Air from within the process building passes through an activated carbon filter system before exiting the premises. Table 3, Schedule 2 of the works approval includes minimum design and construction requirements for the HVAC system, and specifically the 'Activated carbon filtration system and stack' under Requirements a) to i).

In particular, Requirement c) (Activated carbon filtration system and stack) requires:

- c) Incorporates two stage activated carbon filtration system designed to be in operation at all times for scrubbing air from process gas and removal of residual mercury, H<sub>2</sub>S and VOCs to achieve overall levels of ≤0.002 ppm of mercury, ≤1 ppm of benzene (indicator for VOC's) and ≤1 ppm of H<sub>2</sub>S in stack exit gases.

In response to this ground of appeal, DWER advised that in specifying the requirement for an activated carbon filtration system, it set outcome-based criteria for filter performance which include a concentration limit for mercury emissions. DWER advised that the same rationale applies to that outlined in Ground 1 with regards to the application of outcome-based conditions in preference to prescriptive conditions. DWER also noted that the Basel Convention Technical Guidelines for MCW adopted by the United Nations in 2015 no longer include reference to 'sulphur-or iodine-impregnated, activated carbon filters', as listed in the 2010 draft version quoted by the appellant.

In response to this issue, the works approval holder advised that it will comply with the Basel Convention Technical Guidelines for MCW in respect to mercury emissions from the stack, and that it provided DWER with a specification for the carbon in the filters and a proposal for the determination of the remaining capacity of the activated carbon filters. The works approval holder advised that this information is commercial-in-confidence and was therefore not published in DWER's Decision Report.

With regards to the appropriateness of using a H<sub>2</sub>S detection system, DWER noted that H<sub>2</sub>S detection will be used as an early warning sign for potential contaminant breakthrough from the first filter stage and that in addition to this early warning system the second stage filter will be periodically tested for contaminants; if no other indicators are triggered, filters will be replaced according to a schedule informed by the predicted filter capacity.

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<sup>6</sup> Department of Environment and Energy, *Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of, Containing, or Contaminated with Mercury - 5th Draft*, 2010.

<sup>7</sup> *Decision Report – Application for Works Approval W6090/2017/1*, DWER, 8 May 2018, page 31.

<sup>8</sup> *Ibid*, page 57.

It is noted that the Decision Report outlines in section 10.2 indicative recommendations for licence controls for operational management of the premises, including in relation to operational monitoring in respect to replacement of the first stage activated carbon filter and investigating any exceedances in stack emission rates of mercury, H<sub>2</sub>S and benzene. DWER advised that, in the context of the works approval, such considerations are only relevant as far as they relate to ensuring that the proposed operation will include adequate infrastructure/engineering emission controls, and that an assessment conducted as part of a licence application may make further determinations about appropriate licence conditions to control air emissions.

DWER also advised that the Decision Report outlines in sections 10.2.6 and 10.2.7, operational management including H<sub>2</sub>S detection and other monitoring that should be considered when licence conditions are being developed.

### **Conclusion**

Noting the above, it is considered that DWER has considered the matters raised by the appellant relating to the activated carbon filtration system as part of the assessment, and has applied appropriate controls through Condition 2, and specifically Table 3 of Schedule 2, to manage stack emission rates of mercury exiting the premises. It is therefore recommended that this ground of appeal be dismissed.

### **GROUND 3: FUGITIVE EMISSIONS FROM BUILDINGS**

The appellant contended that the proposal relies upon the HVAC system providing negative pressure in the warehouse and process building to keep any mercury vapour within the facility, and that the HVAC system will only operate when the plant is running. The appellant raised concern that mercury vapour will be present in the buildings when the buckets are being loaded or during plant maintenance. The appellant also questioned how negative pressure will be maintained when large roller doors into the process area and warehouse are operated and particularly when hot material in the cool down area is generating positive pressure.

The appellant was of the view that controls should be applied to the works approval requiring the HVAC system to operate 24 hours per day and additional engineering controls be implemented to ensure that no mercury vapour escapes when doors are open or cooling of hot materials occurs.

### **Consideration**

Requirement a) (Process Building overall) in Table 3 of Schedule 2, provides that the process building will be:

- a) Designed and constructed to be fully enclosed and fit for the purpose of maintaining a negative atmospheric pressure generated by the HVAC system.

In response to this ground of appeal, DWER advised that Requirement a) (Process Building overall) is an outcome-based condition that does not require the specification of additional engineering controls.

DWER advised that its risk assessment outlined in Table 16 of the Decision Report identified the need for air extraction and the maintenance of negative pressure in the process building but not in the warehouse. In this regard, the Decision Report states that the warehouse is an enclosed area and incoming MCW will be received in sealed drums or other enclosed containers, and that damaged containers will be stored within the process building.<sup>9</sup>

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<sup>9</sup> *Decision Report – Application for Works Approval W6090/2017/1*, DWER, 8 May 2018, page 18.

With regard to discontinuous operation of the processing facility including the HVAC system, DWER advised that the operation is intended to be continuous 24 hours, seven days per week. In its response, the works approval holder advised that the HVAC fan will run at all times whilst handling any mercury materials.

The works approval holder also advised that interlock and alarm controls provided under Requirements e) and f) (HVAC System building) in Table 3 of Schedule 2, are additional measures:

- e) Design incorporates an interlock associated with the extraction fan to prevent a process batch from starting unless the extraction fan is operational.
- f) Alarms on run signal for the HVAC fan and on suction pressure to the fan to indicate it is functional.

The works approval holder noted that the main access to the process area is not via large roller doors, and there will be airlocks on all openings. The works approval holder also advised that the building design was not specified in the Decision Report as it is commercial-in-confidence information.

DWER was of the view that the conditions are appropriate and sufficient in the context of the works approval to ensure that the proposed operation with its infrastructure will include adequate emission controls. DWER advised that an assessment conducted as part of a licence application may make further determinations about appropriate licence conditions to control air emissions.

## Conclusion

Taking the above information into account, it is considered that DWER has considered the matters raised by the appellant relating to the risk of fugitive emissions as part of the assessment, and has applied appropriate controls through the infrastructure and equipment requirements specified in Table 3 of Schedule 2, to manage fugitive emissions. It is therefore recommended that this ground of appeal be dismissed.

## GROUND 4: CUMULATIVE MERCURY EMISSIONS

The appellant contended that potential cumulative impacts of mercury emissions to air have not been adequately considered, and therefore nearby sensitive receptors and the community will be potentially at risk as the level of mercury in the local environment will increase over time. The appellant was of the view this would breach a key strategy of the National Environment Protection (Ambient Air Quality) Measure (Ambient Air Quality NEPM) and the Minamata Convention on Mercury, to reduce exposure to mercury pollution over time.

## Consideration

In its advice, DWER advised that the works approval holder submitted an air modelling assessment as part of its works approval application, which included predictions for ground level concentrations of emissions from the premises in isolation and also the cumulative impacts on existing air quality in the Kwinana area. The Decision Report states that the expected emission rates, stack design details and local meteorological data were used by the applicant in the air modelling assessment to determine the potential ground level concentrations outside the premises resulting from the stack emissions in isolation and cumulatively considering existing ambient concentrations in the Kwinana Industrial Area. The Decision Report<sup>10</sup> also states that the air quality modelling was reviewed by DWER's Air

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<sup>10</sup> Decision Report – Application for Works Approval W6090/2017/1, DWER, 8 May 2018, page 10.

Quality Services section and determined to have been undertaken generally in accordance with DWER's published *Air Quality Modelling Guidance Notes (2006)*.

Table 20<sup>11</sup> (below) in the Decision Report summaries (among other things) modelled ground level concentrations of mercury from the premises as well as the cumulative emissions scenario. The Decision Report states that the ground level concentrations of mercury were below the relevant ambient air quality criteria for the protection of human health, and noting this, DWER advised that there was not an elevated risk to the public from mercury emissions to air from the premises.

**Table 20: Summary of modelled ground level concentrations compared with assessment criteria**

Parameter	Averaging period	Modelled ground level concentrations ( $\mu\text{g}/\text{m}^3$ )		Assessment criteria ( $\mu\text{g}/\text{m}^3$ )	
		Premises	Cumulative	Applicant	DWER
<b>HUMAN HEALTH</b>					
Mercury	1 hour	0.01	-	1.8 (NSW EPA 2017)	0.6 (OEHHA 2016)
	Annual	0.0007	0.0008	0.2 (WHO 2003)	0.2 (WHO 2003)

DWER considered that the appellant's reference to the Minamata Convention on Mercury was not relevant, given it has not been ratified by Australia, and advised that the appellant's reference to the Ambient Air Quality NEPM in the context of mercury emissions was unclear given neither the NEPM for air toxics nor ambient air quality include mercury.

In its response, the works approval holder advised that the premises would not breach the Minamata Convention on Mercury or the Ambient Air Quality NEPM.

## Conclusion

Noting the above, and particularly DWER's advice that predicted ground level concentrations of mercury from the premises and cumulative emissions were below the relevant ambient air quality criteria for the protection of human health, it is considered that DWER's assessment of the works approval application has addressed the appellant's concerns in this regard. It is therefore recommended that this ground of appeal be dismissed.

## GROUND 5: RISKS ASSOCIATED WITH CINNABAR PRODUCTION

The appellant contended that potential risks associated with the stabilisation of recovered mercury through cinnabar production are not adequately controlled, and that insufficient information was provided in the application for the works approval on how the process would be managed.

The appellant submitted that the cinnabar production process has led to serious industrial accidents overseas, and specifically made reference to media reports about an accident at a German mercury processing plant.

The appellant was of the view that engineering hazard studies should be undertaken by independent specialists and reviewed by the appropriate authorities.

<sup>11</sup> Ibid, page 32.

## Consideration

DWER advised that the information provided on the mercury recovery process in supporting documentation and additional correspondence provided with the works approval application was sufficient to assess the application. DWER noted that it had considered the issues raised by the appellant in this ground of appeal during its review of public submissions received on the application, and provided the following response in Appendix 2 of the Decision Report:

DWER policy excludes employees, visitors or contractors of the Licence Holder as potential receptors of emissions, which is provided for under other state legislation.

The Applicant has advised that the stabilisation of mercury to mercury sulphide within the reactor does cause expansion of the material which is mitigated by not overfilling the reactor. As the majority of the process is undertaken at negative atmospheric pressure in the absence of oxygen, combustion is not likely to occur. The reactor will only be operated within the process building. The process building has an aerosol based fire suppression system installed and the warehouse contains a fire hydrant.

The above commitments have been captured by the Delegated Officer as regulatory controls on the Works Approval and licence as appropriate.

The detailed design of the reactor had not been determined at the time of the Application.<sup>12</sup>

DWER advised that the key mitigation factors included the absence of oxygen and presence of negative pressure making combustion unlikely, and the fill level of the reactor being limited to allow for expansion of material in it, and that these considerations are particularly relevant for the development of licence conditions.

In this regard, Requirement d) (Process Building – Level 1) in Table 3 of Schedule 2, provides:

d) Contains a reactor designed, constructed and fit for the purpose of safely stabilising at least 10 tonnes per annum of recovered mercury into mercury sulphide, with no free mercury present.

DWER advised that Requirement d) sets an appropriate outcome-based goal in the works approval for the design and construction of the reactor.

DWER advised that it reviewed the newspaper articles referenced by the appellant regarding an incident at a German facility, and that it was not possible to determine from this information whether there are any similarities to the infrastructure and processes utilised by the proposal under appeal. DWER noted that one article stated that no environmental impact occurred due to the swift action of the emergency response to extinguish a fire, and that the works approval covers this aspect by requiring an Emergency Response Plan (ERP) under Condition 5. DWER noted, however, that safety and occupational exposure are not covered by the EP Act, which is discussed further in Ground 6.

In its response to this ground of appeal, the works approval holder stated:

BMT provided the DWER with information on the stabilization process, including how the exothermic reaction and the expansion of material are controlled. This is commercial-in-confidence information.

The referenced articles do not provide any information on the cause of the incidents. One incident is reported to have resulted in inhalation of mercury vapour by "one of the employees". All BMT operators wear respiratory protection when handling mercury. It is

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<sup>12</sup> Ibid, pages 60-61.

unclear how the employees were doused in sulphur (if that is the correct translation of the article).

BMT is not a technology provider. We develop and use our own technology, including stabilisation technology.

BMT uses competent third-party engineering companies for all engineering design. We do not believe it is appropriate for DWER to review and approve hazard studies for the engineering design of a reactor.

## Conclusion

Taking the above information into account, it is considered that DWER has considered the matters raised by the appellant relating to the risks associated with cinnabar production as part of the assessment, and has applied appropriate controls through the infrastructure and equipment requirements specified in Table 3 of Schedule 2, to manage the process of cinnabar production. DWER's advice that the control of cinnabar production will be considered further during the licensing process, is also noted. It is therefore recommended that this ground of appeal be dismissed.

## GROUND 6: FIRE OUTBREAK

The appellant contended that risks associated with potential fire outbreak at the premises have not been adequately assessed or controlled. The appellant asserted that appropriate hazard and risk studies should be undertaken and an emergency response plan developed, which should then be available for public review and assessed by the relevant authority. The appellant also contended that the capacity of the fire water containment sump may be insufficient to contain all fire-fighting water run-off from the three levels of the building.

## Consideration

In response to this ground of appeal, DWER advised that it considered emissions from non-standard operational events such as fires, and that details of the risk assessment and considerations of the applicant's proposed controls are outlined in section 9.7 (Risk Assessment – Fire outbreak [non-standard operation, worst case scenario]) of the Decision Report.

It is noted that the Decision Report states that the key findings of the risk assessment for fire outbreak included:

Under the worst case scenario of a large fire, primary emissions of toxic smoke could be expected to affect the health of people outside the Premises, and secondary emissions of contaminated fire water could have varying impacts on human health and the health of waterway ecosystems.<sup>13</sup>

DWER's published *Guidance Statement: Regulatory Principles Environmental Protection Act 1986, Part V; Effective and Efficient Regulation*<sup>14</sup> (Guidance Statement: Regulatory Principles) indicates that DWER will apply regulatory controls that are proportionate to the level of risk (consequence and likelihood) that an activity poses to public health and the environment, to ensure there is no unacceptable risk of harm to either. In this instance, DWER assessed the potential fire outbreak risks from emissions of toxic smoke and discharge of contaminated fire water released to unsealed ground and determined a residual risk rating of 'medium' (with fire management controls in place) using the risk rating matrix in the Decision Report<sup>15</sup>.

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<sup>13</sup> Ibid, page 42.

<sup>14</sup> *Regulatory Principles, Environmental Protection Act 1986, Part V, Effective and efficient regulation*, Department of Environment Regulation, July 2015.

<sup>15</sup> *Decision Report – Application for Works Approval W6090/2017/1*, DWER, 8 May 2018, pages 30 and 39-42.

DWER advised that it identified the need for an ERP, which includes a risk assessment of hazardous areas and all relevant design and storage details that support the mitigation of risk events, which is specified in Condition 5.

Condition 5 (Records), provides that:

5. The Works Approval Holder must prepare and submit to the CEO an Emergency Response Plan prior to the commencement of Works, which includes:
  - (a) identification and risk assessment of all hazardous areas (e.g. areas with potentially toxic or flammable gas atmospheres) within the Premises;
  - (b) a description of the potential risk events associated with hazardous areas which could have adverse impacts on the public or the environment;
  - (c) all relevant design and storage details which support the mitigation of risk events at the Premises; and
  - (d) the details of emergency procedures in place for risk events if they occur.

DWER advised that the ERP will be submitted prior to the commencement of construction so that any construction-relevant findings can be considered at that stage, and that it will review the adequacy of the ERP once submitted and take into account whether third party specialist inputs have been sought in its development.

In relation to the appellant's concerns that the draft ERP should be open for public comment, DWER was of the view that there will be sufficient opportunity for public comment on this aspect through the licence application process.

With regards to concerns around the capacity of the fire water containment sump, DWER advised that this aspect has been considered in the Warehouse infrastructure and equipment requirements specified under Requirements b) and c) in Table 3 of Schedule 2, which directly specify that sizing of this area needs to accommodate fire-fighting water volumes.

Requirements b) and c) (Warehouse) in Table 3 of Schedule 2, provide:

- b) Designed and constructed to include a sealed hardstand floor which is impermeable to mercury and hydrocarbons, and surrounded with an equally impermeable bund which is adequately sized for the purpose of containing spillages and/or fire-fighting water in the event of a fire, or holds at least 35 m<sup>3</sup> of liquid (whichever is greater).
- c) Designed and constructed so that the sealed hardstand floor drains to an impermeable sump to enable the pumping of collected spillage/fire water back into the process, if necessary.

In its response to this ground of appeal, the works approval holder advised that emergency response plans were not available at the stage of the works approval application as details of the emergency exits had not been completed, and that a commitment was made to develop the emergency response plans in consultation with the Department of Fire and Emergency Services and Kwinana Industries Mutual Aid, including neighbouring industries.

The works approval holder also advised that details of how fire water is to be contained within the sumps was provided to DWER, and that this information is commercial-in-confidence.

## Conclusion

Taking the above information into account in respect to DWER's assessment of the application for a works approval in relation to potential fire outbreak, it is considered that the controls applied to the premises are adequate and appropriate to manage the matters raised

by the appellant under this ground of appeal. It is therefore recommended that this ground of appeal be dismissed.

## **OTHER MATTERS**

The appellant raised matters in the appeal that are not related to the conditions of the works approval but relate to either DWER's licensing process under Part V of the EP Act or other statutory approval processes. These matters are noted below together with DWER's advice and the works approval holder's response, however as they do not relate to the conditions of the works approval they are not considered further in the context of this report.

### **Licensing**

The appellant raised the following matters which relate to operational aspects of the proposal, and are therefore appropriately for consideration by DWER in any future assessment of a licence application in respect to the premises.

#### Storage of waste not adequately controlled causing safety risk

The appellant contended that the proposed process does not remove all mercury from the waste, and that only liquid and organic mercury is extracted leaving inorganic mercury remaining in the processed material. The appellant submitted the works approval states that the amount of MCW permitted to be stored on the premises is 200 tonnes, and that it is not clear whether all the forms of mercury contained in incoming MCW, outgoing waste and cinnabar have been considered. The appellant is concerned that this uncertainty presents significant safety risks.

In response, DWER advised that the works approval states that the facility is designed to process up to 1,000 tonnes of MCW per year and that a maximum of up to 200 tonnes of MCW can be stored in the designated storage area of the warehouse at any one time. DWER also advised that further details on handling and storing MCW including cinnabar will be assessed and conditioned during the licensing process.

In relation to concerns around the safety risk associated with waste storage, DWER noted that safety is covered in legislation other than the EP Act.

In its response, the works approval holder advised that the proposed technology will remove mercury in all forms from the MCW, and that all residual materials will meet the limits to be considered 'mercury free' or otherwise the materials will be retreated. The works approval holder also advised that an application for a dangerous goods site licence for the premises will be submitted to the Department of Mines, Industry Regulation and Safety (DMIRS), which will specify quantity limits for the different classes of mercury containing materials, including cinnabar.

#### Mercury contamination risks inadequately controlled due to unknown amounts of mercury left in processed material

The appellant contended that there is uncertainty in determining the mercury content of materials which have been processed by the treatment plant because the description of the testing procedure lacks clarity with regard to the different forms of mercury present in the material. The appellant asserted that the uncertainty represents a hazard, and that the works approval should be modified to clarify the type of testing conducted on processed material.

In response, DWER advised that the conditions of the works approval have been developed to ensure that appropriate infrastructure is in place for the type of process proposed and the amounts and types of waste materials handled and stored.

DWER disagreed with the assertion that emission and contamination risks are not sufficiently understood due to a lack of information on the concentrations of the different forms of mercury which are present in the materials and emissions. DWER advised that the Decision Report provides a summary of relevant operational aspects in section 4.1.3, and that the potential emissions and discharges generated from storing and processing MCW have undergone risk assessment as outlined in section 9 (Risk assessment) of the Decision Report.

In its response, the works approval holder advised that the proposed technology removes mercury from waste in all forms, and that the testing methodology is commercial-in-confidence.

DWER also advised that the specific detail on the concentrations of mercury compounds that may trigger re-processing of materials is not relevant for the works approval stage, and that a more detailed assessment of operational procedures, including the testing of processed materials, will be part of assessing a licence application.

### **Other statutory processes**

The appellant also raised matters in the appeal that are related to other statutory approval processes and are therefore considered to be beyond the scope of this appeal report.

#### Security risk not adequately controlled

The appellant raised concerns about the lack of consideration of security controls in the works approval, and contended that a security risk assessment should be undertaken by the appropriate authority and controls applied before any approval to operate is granted.

In its advice, DWER advised that security matters are not regulated through the EP Act. DWER noted that section 5.3.2 of the Decision Report states the works approval holder must abide by the *Dangerous Goods Safety Act 2004* and subsidiary legislation, and that a dangerous goods site licence issued by DMIRS is required once dangerous goods are held on the premises. DWER also advised that security matters are part of that legislation.

In its response, the works approval holder advised that its application had specified a perimeter fence and that all mercury handling activities would occur within an enclosed building. The works approval holder also advised that details on security controls have been provided to the City of Kwinana and the Western Australian Planning Commission as part of a planning development application and will also be provided in security management plans which will be submitted in an application for a dangerous goods site licence.

#### Transport of hazardous waste

The appellant raised concern about potential fugitive emission risks from transporting MCW large distances from north-west Western Australia to the premises and the future transport of processed material offsite, and contended that the application has not adequately demonstrated how these risks will be controlled.

In its advice, DWER advised that transport-related emission risks were not considered within the scope of the works approval assessment, and that section 4.3 (Exclusions to the premises) of the Decision Report delineates this exclusion and describes the relevant

legislative provisions and regulations that cover these aspects. DWER advised that the transport of dangerous goods is a matter for regulation under the *Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007*, which is administered by DMIRS.

## **CONCLUSION AND RECOMMENDATION**

Following the consideration of the issues raised in the appeal, advice from DWER and information provided by the works approval holder, it is considered that DWER has had regard for the matters raised through the appeal and has applied appropriate conditions to manage identified risks and impacts in accordance with its relevant guidelines.

It is therefore recommended that the appeal be dismissed.

With regards to the issues raised through the appeal that relate to the operational phase of the mercury processing plant, it is understood that an operating licence will be required under Part V of the EP Act. It is noted that the licensing provisions provide for public comment on applications for licences, and an opportunity for third party appeals in respect to the conditions applied to any licence which is issued.

Emma Gaunt  
Appeals Convenor

**Investigating Officer:**  
Michael Power, Senior Appeals Officer