



Report and recommendations of the Environmental Protection Authority



**Wagerup Alumina Refinery – Production
to a maximum capacity of 4.7 million tonnes
per annum and associated bauxite mining
– inquiry under section 46 of the
Environmental Protection Act 1986
to amend Ministerial Statements 728 and 1069**

Alcoa of Australia Limited

Report 1691

November 2020

Inquiry under section 46 of the *Environmental Protection Act 1986*

The Minister for Environment has requested that the Environmental Protection Authority (EPA) inquire into and report on the matter of changing the implementation conditions 8, 9, 10, 11 and 12 of Ministerial Statements 728 and 1069 relating to the Wagerup Alumina Refinery, in order to facilitate an increase in production to 3.3 million tonnes per annum, without triggering the upper limit expansion of a third production unit to 4.7 million tonnes per annum.

Section 46(6) of the *Environmental Protection Act 1986* requires the EPA to prepare a report that includes:

- (a) a recommendation on whether or not the implementation conditions to which the inquiry relates, or any of them, should be changed
- (b) any other recommendations that it thinks appropriate.

The following is the EPA's report to the Minister pursuant to section 46(6) of the *Environmental Protection Act 1986*.



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Chairman

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1. The Proposal

The Wagerup Alumina Refinery Revised Proposal (the revised proposal) is to construct and operate the Wagerup Alumina Refinery (the refinery) to a maximum production capacity of 4.7 million tonnes per annum (Mtpa) and its associated bauxite mining. The proponent for the proposal is Alcoa of Australia Limited (Alcoa).

The Environmental Protection Authority (EPA) assessed the revised proposal at the level of Environmental Review and Management Program (ERMP) and published its report in January 2006 (Report 1215). In this report, the EPA considered the following key environmental factors were relevant to the revised proposal:

- Air pollutant emissions
- Predicted ambient air quality and Health Risk Assessment
- Potential for health and amenity impacts due to short-term ground level concentrations
- Land use management in proximity to the refinery
- Noise
- Greenhouse gases.

In applying the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020c) these factors are now represented by:

- Air Quality
- Social Surroundings
- Greenhouse Gas Emissions.

The EPA concluded in Report 1215 that “having considered the advice of the Department of Health and Department of Environment, the EPA considers that approval for expansion at Wagerup could be considered provided appropriate safeguards were adopted to protect and monitor the health of the community”.

Subsequent to finalising appeal determinations (Appeal No. 06/007-056) the then Minister for Environment approved the proposal for implementation, subject to the implementation conditions of Ministerial Statement (MS) 728 on 14 September 2006.

Context

The refinery operates under Part IV of the *Environmental Protection Act 1986* (EP Act) through MS 728 and MS 1069 and is also subject to Environmental Licence L6217/1983/15 granted under Part V of the EP Act (Part V Licence). The Part V Licence currently provides for alumina production to 2.85 Mtpa at the refinery. At the time of writing this report, the Part V Licence is under consideration for changes to production to 2.9 Mtpa by the Department of Water and Environmental Regulation (DWER).

The refinery commenced operations in 1984. Alcoa was granted approval under Part IV of the EP Act in 1990 to expand production at the refinery from 840,000 tonnes per annum to 1.5 Mtpa through MS 95.

In 1995, Alcoa was granted approval under Part IV of the EP Act to increase production at the refinery to 3.3 Mtpa through MS 390, amended by MS 564 in 2001.

The refinery garnered significant local and regional interest during this time, with concerns regarding air quality, odour, health impacts, and noise from community members living in neighbouring towns such as Yarloop, Hamel, and Cookernup (the Wagerup community).

In 2006, Alcoa's revised proposal was granted approval under Part IV of the EP Act to increase production to 4.7 Mtpa through MS 728, amended by MS 897 and MS 1069 in 2012 and 2017 respectively (changes discussed below). The increase in production to 4.7 Mtpa was proposed by Alcoa through development of a third production unit at the refinery. The EPA assessed the revised proposal at the level of ERMP, which was the highest level of assessment at that time.

The ERMP was conducted by comparing the (then) Part V Licence capacity of 2.5 Mtpa to the upper limit expansion of 4.7 Mtpa.

Alcoa considers that approval of the refinery to 3.3 Mtpa by MS 564 sits concurrent with approval of the refinery to 4.7 Mtpa of MS 728 and has requested this s. 46 inquiry to clarify the conditions that apply to 3.3 Mtpa compared to the upper limit of expansion to 4.7 Mtpa.

Previously approved changes to the conditions

The revised proposal has undergone several changes to conditions under s. 46 of the EP Act.

Alcoa made a request to the EPA in 2011 for an extension of time for substantial commencement of the revised proposal. Condition 4 of MS 728 was changed to extend the time limit for implementation until 14 September 2016. The s. 46 inquiry resulted in the publication of MS 897 by the then Minister for Environment on 9 May 2012, concurrent to MS 728.

Alcoa made a request for a further extension of time for substantial commencement of the revised proposal in February 2016. The then Minister for Environment issued a s. 46A Notice of Interim Implementation Conditions, extending the time limit for implementation until 27 September 2017. The effect of the notice of interim implementation conditions was to provide the EPA time to assess Alcoa's request for a further extension of time under s. 46 of the EP Act.

Condition 4 of MS 728 was changed again to extend the time limit for substantial commencement of the revised proposal until 27 September 2022, and to clearly specify that the condition relates to that portion of the revised proposal, being the third production unit. The s. 46 inquiry resulted in the publication of MS 1069 by the

then Minister for Environment on 18 December 2017, which superseded MS 897 and sits concurrent to MS 728.

MS 1069 also provides changes to wording for conditions 8, 9, 10, 11 and 12 to specifically relate to the upper limit expansion of a third production unit to 4.7 Mtpa.

2. Requested Changes to the Conditions

In August 2018, Alcoa requested changes to implementation conditions 8, 9, 10, 11 and 12 of MS 728 and MS 1069 to facilitate an increase in production from 2.85 Mtpa to 3.3 Mtpa at the refinery, without triggering the upper limit expansion of 4.7 Mtpa.

In October 2018, the Minister for Environment requested that the EPA inquire into and report on the matter of changing the implementation conditions of MS 728 and MS 1069 for the proposal.

In September 2019, Alcoa submitted documentation to the EPA in support of its change to conditions application, including the Wagerup Alumina Refinery – Request for Section 46 Review of Conditions Final Report (Alcoa 2019a) (supporting documentation). In its supporting documentation, Alcoa requested the following changes to implementation conditions of MS 728 and MS 1069:

- Replacement of the term ‘third production unit’ with ‘expansion works’ in condition 4 of MS 1069, relating to the time limit for implementation of the proposal.
- Splitting of conditions 8-1 and 9-1 into two sections to allow a staged approach for expansion works at the refinery. Conditions 8-1 and 9-1 would refer to conditions required for production up to 3.3 Mtpa, whilst the proposed conditions 8-1A and 9-1A would refer to conditions required to increase production past 3.3 Mtpa to a maximum limit of 4.7 Mtpa.
- Removal of quantitative emission reductions from condition 8-1, an update of baseline emission rates to the Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a), and inclusion of a definition for the term ‘best practice’.
- Condition 9-1A to include an additional investigation for measurement and assimilation of vertical wind velocity measurements into the Wagerup air dispersion model for continuous improvement.
- Updates to condition 10 to ensure consistency with the proposed changes to conditions 8 and 9, and to remove outdated references.
- Deletion of condition 11 to remove regulatory duplication with the *Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012* (State of Western Australia 2012) (regulation 17 approval) pursuant to regulation 17 of the Environmental Protection Noise Regulations 1997 (Noise Regulations).
- Deletion of condition 12 to remove regulatory duplication with Alcoa’s Water Licence under the *Rights in Water and Irrigation Act 1914* (RIWI Act).
- Minor updates to procedure 1 and note 4 to ensure consistency with the proposed changes to conditions 8 and 9, and to remove outdated references.

This report satisfies the requirements of the EPA’s inquiry.

3. Inquiry into Changing the Conditions

The EPA has discretion as to how it conducts this inquiry. In determining the extent and nature of this inquiry, the EPA had regard to information such as:

- the currency of its original assessment (Report 1215)
- subsequent s. 46 inquiry (Report 1604)
- MS 728 and MS 1069
- information provided by the proponent, including:
 - Wagerup Alumina Refinery – Request for Section 46 Review of Conditions Final Report (Alcoa 2019a)
 - Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a)
 - Estimation of Volatile Organic Compound (VOC) Emissions from 45K Cooling Towers at Wagerup Refinery (Alcoa 2019b)
 - Wagerup Refinery Efficiency Project Current, Planned and Potential Future VOC and Odour Emissions Control Measures (Alcoa 2019c)
 - Wagerup Alumina Refinery – Request for Section 46 Review of Conditions Consultation Addendum (Alcoa 2020b)
 - Wagerup Alumina Refinery Air Quality Modelling: Phase 2 Study (Alcoa 2020c)
 - Wagerup Alumina Refinery Expansion – Health Risk Assessment 2020 (Alcoa 2020d)
- advice from relevant decision-making authorities
- advice from an independent toxicologist and health risk assessor
- a submission from the local community group Community Alliance for Positive Solutions
- any new information regarding the potential impacts of the proposal on the environment.

EPA Procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* (State of Western Australia 2016) and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020b).

4. Inquiry Findings

The EPA considered that the following are the key environmental factors relevant to the change to the conditions:

- Air Quality and Social Surroundings (odour)
- Social Surroundings (noise)
- Inland Waters.

Greenhouse Gas Emissions

The EPA has concluded that Greenhouse Gas Emissions is not a key environmental factor for this inquiry.

As discussed above in the Context section of this report, Alcoa was provided approval to operate the refinery to 3.3 Mtpa under MS 390 (amended by MS 564), and currently has approval to operate the refinery to a maximum capacity of 4.7 Mtpa.

The EPA considers this inquiry relates specifically to the mechanism Alcoa has proposed to achieve capacity to 3.3 Mtpa and a maximum capacity of 4.7 Mtpa, rather than assessing whether or not the increase should or should not occur.

In addition, the EPA notes that the overall increase in greenhouse gas emissions was previously assessed as part of the revised proposal, as set out in Report 1215.

4.1 Air Quality and Social Surroundings (odour)

The EPA's environmental objective for Air Quality is *to maintain the air quality and minimise emissions so that environmental values are protected.*

The EPA's environmental objective for Social Surroundings is *to protect social surroundings from significant harm.*

Conclusions from EPA Report 1215

Air Quality and Social Surroundings (odour) (previously Air pollutant emissions, Predicted ambient air quality and Health Risk Assessment, and Potential for health and amenity impacts due to short-term ground level concentrations) were considered as key environmental factors for the revised proposal. The EPA's assessment of these factors was comprehensive and considered a range of information from Alcoa, air quality experts, health professionals and the public.

Air Quality

The EPA considered emissions from the refinery had been reasonably characterised and quantified for assessment of the proposed expansion, and that emissions of Volatile Organic Compounds (VOCs) would change and reduce over time with Alcoa's proposed pollution control and management measures.

The EPA identified that the predicted emissions rates for the revised proposal would need to be fully substantiated during the subsequent Works Approval application under Part V of the EP Act, to demonstrate the assumed performance improvement levels were achievable and ensure pollution control management measures were best practice.

Alcoa's air dispersion modelling found that the predicted Ground Level Concentrations (GLCs) were well within the National Environment Protection (Ambient Air Quality) Measure (NEPM) standards for criteria pollutants (including particles as PM₁₀) and air toxics. The EPA recommended no net increase in ambient GLCs for key pollutants from the refinery through implementation of the proposed expansion. Key pollutants included oxides of nitrogen, carbon monoxide, sulphur dioxide, particulates (PM₁₀), benzene, formaldehyde, toluene and xylenes.

The EPA concluded Alcoa's air dispersion modelling was conservative and adequate for the purposes of its assessment of the revised proposal, and further work would be required to enable performance verification after construction of the proposed third production unit.

As part of the ERMP, Alcoa provided an Air Quality Management Plan (AQMP) (Alcoa 2005a) to specify its proposed monitoring and management measures, and verification program for emission levels. The EPA considered the AQMP would need to be reviewed and refined during the detailed design stages for the revised proposal, including methodology, procedures and emissions monitoring for validation of performance levels.

Alcoa's Health Risk Assessment (HRA) (Alcoa 2005b) concluded that the predicted GLCs from baseline emissions and expanded emissions would not result in adverse health impacts, chronic health impacts or increased cancer risk to the Wagerup community. The Department of Health reviewed Alcoa's HRA and verified the findings. A peer review of the HRA was also undertaken, concluding that it was "prudent, conservative and health protective" (Bisby 2005).

Social Surroundings (odour)

The HRA concluded that emissions from the refinery did not present an abnormal public health risk, and ambient air quality monitoring consistently found levels to be below odour and irritation threshold limits. However, the EPA noted irritation and health symptoms were perceived by local residents suffering from hypersensitivity to chemicals. The EPA concluded this was likely due to very low concentrations of emissions over periodic short-term GLC events, occurring under complex meteorological conditions.

DWER (previously Department of Environment) advised the EPA that complaints received from the Wagerup community were associated with odour events and these might relate to health symptoms. The EPA noted the history of health issues reported in the Wagerup area and that, despite Alcoa implementing a series of emissions reductions programs, complaints persisted.

As part of the ERMP, Alcoa proposed engineering measures to reduce odour and VOC emissions and ensure odour impacts and short-term health effects would not increase due to implementation of the proposed expansion. The EPA considered Alcoa's odour assessment reasonably demonstrated that the proposed expansion could be implemented without increasing odour impacts on the Wagerup community.

The EPA concluded that implementation of the revised proposal should not result in any increased amenity impacts on the Wagerup community due to odour, and that all practicable measures should be undertaken to reduce impacts.

To manage the impacts to Air Quality and Social Surroundings (odour), the EPA recommended the following conditions:

- Condition 8 to demonstrate that the engineering design meets best practice and achieves the quantitative VOC and odour emissions reductions at the refinery, as set out in the ERMP.
- Condition 9 to further validate the air dispersion modelling after additional investigations and data acquisition have been completed, and achieve GLCs as predicted in the ERMP.
- Condition 10 to require a detailed emissions verification program of the refinery once the revised proposal expansion works had been implemented.
- Procedure 1 to form an Independent Design Review Team to comprise specialists in design, construction, commissioning and monitoring of large industrial plants to be established by DWER to work collaboratively with Alcoa during the engineering design process, prior to submission of its Work Approval application.

Assessment of the requested change to conditions

The EPA considered the following current environmental policy and guidance relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Air Quality* (EPA 2020a)
- *Environmental Factor Guideline – Social Surroundings* (EPA 2016).

Condition 8 – Best Practice Pollution Control Measures to be Applied

Alcoa proposes additional equipment and process enhancements of existing equipment at the refinery to achieve a production of 3.3 Mtpa without triggering the upper limit expansion to 4.7 Mtpa.

Proposed works include removing process bottlenecks of the existing two production units and the addition of new equipment in the existing Bayer circuits, including

construction of a new calciner. The proposed works do not include changes to the liquor burner or residue storage areas. Further details of Alcoa's proposed works for 3.3 Mtpa are provided in Alcoa's supporting documentation: Wagerup Refinery Efficiency Project: Current, Planned and Potential Future VOC and Odour Emissions Control Measures (Alcoa 2019c) (the Wagerup Refinery Efficiency Project).

For 3.3 Mtpa, Alcoa proposes changes to condition 8 to achieve a staged approach by splitting condition 8-1 into two sections. The proposed condition 8-1 would refer to conditions required for production up to 3.3 Mtpa, whilst the proposed condition 8-1A would refer to conditions required to increase production past 3.3 Mtpa to a maximum limit of 4.7 Mtpa.

Alcoa also proposes removal of quantitative emission reductions from condition 8-1, an update of baseline emission rates to the Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a), and inclusion of a definition for the term 'best practice'.

The EPA received technical advice from DWER in relation to the proposed changes to condition 8.

Alcoa's supporting documentation, including the Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a), was reviewed by DWER for the purposes of the s. 46 inquiry. DWER provided detailed feedback to Alcoa to improve future collection and analysis of emissions and sources at the refinery, for example increasing its monitoring of water quality from the 45k Cooling Towers. The EPA considers it appropriate to update the baseline emissions for the refinery to the Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a).

In its supporting documentation, Alcoa concluded that the proposed Wagerup Refinery Efficiency Project works to 3.3 Mtpa would result in an overall reduction in VOC emissions and effectively no increase in odour from the refinery due to implementation of an emission abatement solution (for example, installation of a regenerative thermal oxidiser on the slurry storage tanks). DWER advised that there is potential for Alcoa to secure further emissions reductions at the refinery. The EPA considers further emissions reductions for both VOCs and odour should be explored by Alcoa through preparation of a Detailed Design Report as part of condition 8.

The EPA notes that Alcoa already has approval to 4.7 Mtpa, and as proposed, the production at 3.3 Mtpa is unlikely to result in VOC and odour emissions different to those previously assessed through the ERMP.

Based on the information above, the EPA considers the splitting of condition 8-1 to achieve a staged approach to the expansion does not present any additional air quality impacts to those assessed as part of the ERMP in Report 1215. The EPA is therefore supportive of the splitting of condition 8-1 to achieve a staged approach.

Alcoa proposes to remove quantitative targets in condition 8-1. The EPA notes the intent of condition 8 (as set out in Report 1215) was to secure emissions reductions at the refinery to reduce impacts from odour and air quality to the environment, and impacts to community individuals with sensitivities to chemicals.

The EPA considers removal of specific targets to reduce emissions may represent a weakening of the approved conditions, which were the subject of a high level of public scrutiny and ultimately strengthened by the then Minister for Environment through the appeals process (Appeal Decision Summary, Appeals No. 007-056/2006). However, the EPA is also of the view that the existing targets should be revised based on the current understanding of emissions from the refinery.

The EPA provided its view to Alcoa and requested the targets be revised and contemporised as part of the proposed conditions 8-1 and 8-1A. Alcoa provided the following targets for inclusion in condition 8-1 to 3.3 Mtpa:

- at least a 75% reduction in peak and average emissions rates of VOCs and odour from Slurry storage tanks vents (25A tanks)
- reduction to negligible emissions of VOCs and odour from calciner vacuum pumps exhaust vents for any new calciner.

For condition 8-1A to 4.7 Mtpa, Alcoa proposes a comprehensive program to target emissions reductions from the following sources:

- milling vents (building 25)
- seed filtration stacks (building 44)
- filtration tank vents (35A unit) and causticisation tank vents (35J unit)
- sand separation stacks (building 26)
- boilers and turbines stacks (building 110)
- calciner stacks
- calciner vacuum pumps exhaust vents
- 45K Cooling Towers.

Alcoa proposes to remove the residue disposal area target from this condition as it is appropriately managed through its Part V Licence. All other major sources of emissions have been captured in the condition as proposed.

The purpose of the emissions reduction program is to identify best practice pollution control measures for the above sources during the detailed design phase of expansion to 4.7 Mtpa. Importantly, Alcoa is required to demonstrate that any expansion past 3.3 Mtpa at the refinery would achieve no net increase in VOC or odour emissions.

The EPA notes that the proposed targets for condition 8-1A are not quantitative, however the emissions reduction program as proposed would be required to be reviewed by the Independent Design Review Team (per procedure 1 of MS 728) for approval by DWER. The EPA considers the Independent Design Review Team and DWER would provide rigorous oversight and ensure that emissions reductions are meaningful and best practice.

The EPA considers the above targets are appropriate and the proposed conditions 8-1 and 8-1A align with the intent of the original condition. Therefore, the EPA

recommends the abovementioned emissions reduction targets for inclusion to conditions 8-1 and 8-1A.

Further, the EPA is of the view that Alcoa's VOC and odour emissions data, set out in the detailed design reports for conditions 8-1 and 8-1A, should be made publicly available. The EPA considers that the publishing of Alcoa's emissions data would provide transparency and confidence to the Wagerup community that the refinery would achieve no net increase in VOC and odour emissions to 3.3 Mtpa and 4.7 Mtpa. The EPA has recommended condition 8-1B in this regard.

DWER provided advice to the EPA that condition 8-5 presents significant challenges due to Alcoa's gradual production increases at the refinery through its Part V Licence. To help alleviate community tensions, DWER agreed that Alcoa's definition of the term 'best practice' should be included in condition 8-5. In addition, DWER noted wording such as 'where possible' and 'significantly increase' are subjective and cause uncertainty with community members. DWER advised that the terms should be removed and defined in the condition respectively. The EPA agreed and provided this view to Alcoa, requesting a definition for the term 'significant increase'.

Alcoa provided the following definition of 'significant increase' for the inclusion to condition 8-5: "A significant increase is defined as more than a 5% increase on the assessed annual production capacity for the Licence for the refinery (as amended) under Part V of the *Environmental Protection Act 1986*, but in any event not greater than the approved annual alumina production as defined in Schedule 1."

The EPA considers the above definition appropriate and recommends its inclusion to condition 8-5.

Based on the information above, the EPA recommends the following changes to condition 8 of MS 728 and MS 1069:

- update the baseline data references in condition 8 to the Wagerup Refinery 2018 Emissions Inventory (Alcoa 2020a)
- splitting of condition 8-1 into two sections to allow a staged approach for expansion works at the refinery, including condition 8-1 to increase production up to 3.3 Mtpa, and condition 8-1A to increase production past 3.3 Mtpa to a maximum limit of 4.7 Mtpa
- revised quantitative emission reductions for conditions 8-1 and 8-1A
- inclusion of condition 8-1B to make Alcoa's VOC and odour emissions data publicly available.
- minor changes to conditions 8-2, 8-3, 8-4 and 8-5 for consistency with changes to conditions 8-1 and 8-1A, and contemporisation.
- inclusion of definitions into condition 8-5 for the terms 'best practice' and 'significantly increase', and removal of the term 'where possible'.

Condition 9 – Air Dispersion Model Validation

As discussed above for condition 8, Alcoa proposes to achieve 3.3 Mtpa at the refinery through a staged approach by splitting condition 9-1 into two sections. The proposed condition 9-1 would refer to conditions required for 3.3 Mtpa, whilst the proposed condition 9-1A would refer to conditions required to increase production past 3.3 Mtpa to a maximum limit of 4.7 Mtpa.

In addition, Alcoa proposes that condition 9-1A includes an investigation for the measurement and assimilation of vertical wind velocity measurements into the Wagerup air dispersion model.

Alcoa also proposes minor changes to condition 9-2(2) to require demonstration that the GLCs are 'consistent with' the ERMP predicted GLCs rather than the current wording 'achieve'. Alcoa has requested this change for consistency with its staged approach (i.e. the requirement for air dispersion modelling to be done at various production rates from 3.3 Mtpa up to 4.7 Mtpa as production is increased in increments).

The EPA sought comment from the community group Community Alliance for Positive Solutions (CAPS) in regard to Alcoa's proposed changes as part of the s. 46 inquiry. CAPS provided a detailed submission regarding the proposed changes and requested a full health study be undertaken and peer reviewed prior to any production increases. The EPA agreed with CAPS and requested that Alcoa submit an updated HRA using the new baseline and refinery emissions scenarios up to 3.3 Mtpa.

Alcoa's HRA was conducted using conservative assumptions regarding toxicity and exposure scenarios, representing a likely worst case of health risk posed by emissions from the refinery. The HRA concluded that the predicted GLCs from baseline emissions and emissions up to 3.3 Mtpa would not result in acute health impacts, chronic health impacts or increased cancer risk to the surrounding Wagerup community (Alcoa 2020d).

DWER commissioned a peer review of the HRA by an independent expert toxicologist and health risk assessor. The peer review found that the conclusions made in Alcoa's HRA are supported by the methods, calculations and assumptions, and are therefore reliable. The peer review identified minor amendments would be required of the document before finalisation, and that a broader risk assessment should be undertaken by Alcoa to consider secondary pathways such as dust deposition and subsequent human exposure (CDM Smith 2020).

The EPA notes that Alcoa has amended its HRA consistent with the peer review. The updated HRA (Alcoa 2020e) is available on the EPA website.

The EPA received technical advice from DWER in relation to the proposed changes to condition 9.

Alcoa's supporting documentation, including the Wagerup Alumina Refinery Air Quality Modelling: Phase 2 Study (Alcoa 2020c) was reviewed by DWER, who found

that overall, the modelling was completed in accordance with the requirements of conditions 9-1 and 9-2 of MS 728 and 1069, and that the proposed changes to condition 9 are reasonable. However, DWER advice is clear that limitations remain in understanding the complex meteorology observed in the region and how these conditions are simulated by the current model configuration.

The EPA notes that, as discussed in Report 1215, complex meteorological events might cause irritation and health symptoms in local residents suffering from hypersensitivity to chemicals.

Based on the information above, the EPA is supportive of the proposed changes to conditions 9-1, 9-1A and 9-2 as long as air dispersion modelling of health and amenity impacts is appropriately conservative to account for uncertainties of the complex meteorological events and emissions.

Further, the EPA notes its recommendations for condition 8 above – that targeted emissions reductions are retained, and for Alcoa to explore further emissions reductions through preparation of a Detailed Design Report for 3.3 Mtpa, and for 4.7 Mtpa.

As discussed in condition 8 above, Alcoa concluded that the proposed expansion works to 3.3 Mtpa would result in no discernible changes to VOC and odour emissions. The EPA notes that Alcoa already has approval to 4.7 Mtpa, and as proposed, production at 3.3 Mtpa is unlikely to result in emissions different to those previously assessed through the ERMP.

The EPA considers the splitting of condition 9-1 to achieve a staged approach does not present any additional environmental impacts to those already assessed as part of the ERMP, and is therefore supportive of the splitting of condition 9-1, as consistent with condition 8-1.

Similar to condition 8-5, DWER provided advice to the EPA that condition 9-4 presents significant challenges due to Alcoa's gradual production increases at the refinery through its Part V Licence. The EPA considers condition 9-4 should be changed to be consistent with condition 8-5.

Based on the information above, the EPA recommends the following changes to condition 9 of MS 728 and MS 1069:

- splitting of condition 9-1 into two sections to allow a staged approach for expansion works at the refinery, including condition 9-1 for production up to 3.3 Mtpa, and condition 9-1A to increase production past 3.3 Mtpa to a maximum limit of 4.7 Mtpa
- inclusion of an additional investigation in condition 9-1A, for the measurement and assimilation of vertical wind velocity measurements into the Wagerup air dispersion model.
- minor change to condition 9-2(2) to require demonstration that GLCs are 'consistent with' the 2005 ERMP predicted GLCs.

- minor changes to conditions 9-2, 9-3, and 9-4 for consistency with changes to conditions 9-1 and 9-1A, and contemporisation.
- inclusion of a definition into condition 9-4 for the term 'significantly increase', and removal of the term 'where possible'.

Condition 10 – Operational Performance Verification

Alcoa proposes minor changes to condition 10, to ensure consistency with the proposed changes to conditions 8 and 9, and to remove outdated references.

The EPA considers these minor changes to condition 10 are administrative and for consistency with the proposed changes to conditions 8 and 9. The EPA supports the minor amendments.

Similar to conditions 8-5 and 9-4, DWER provided advice to the EPA that condition 10-7 presents significant challenges due to Alcoa's gradual production increases at the refinery through its Part V Licence. The EPA considers condition 10-7 should be changed to be consistent with conditions 8-5 and 9-4.

Based on the information above, the EPA recommends the following changes to condition 10 of MS 728 and 1069:

- minor changes to conditions 10-1, 10-2, 10-3, 10-4, and 10-5 for consistency with changes to conditions 8 and 9
- inclusion of a definition into condition 10-7 for the term 'significantly increase', and removal of the term 'where possible'.

4.2 Social Surroundings (noise)

The EPA's environmental objective for Social Surroundings is *to protect social surroundings from significant harm*.

Conclusions from EPA Report 1215

The EPA assessed Alcoa's ERMP in parallel to an application made by Alcoa under regulation 17 of the Noise Regulations to vary the assigned noise levels from the refinery (regulation 17 application).

The EPA noted that plans for the proposed expansion were in early design stages, and therefore further reductions in noise emissions would be explored during the detailed design phase.

In order to ensure noise emissions reductions for the expansion at the refinery, the EPA recommended development of a Noise Management Plan to be made publicly available, and considered during the Works Approval application under Part V of the EP Act. Report 1215 specifically states that the Noise Management Plan be required through Ministerial conditions, rather than through the regulation 17 application.

Even with the abovementioned reductions, the EPA concluded that noise emissions from the expanded refinery (to 4.7 Mtpa) would be unable to reasonably or practicably comply with the prescribed standards set out in the Noise Regulations.

To manage the abovementioned impacts, the EPA recommended the following:

- approval of the regulation 17 application, to provide for variation to the prescribed standard for noise emissions granted under the Noise Regulations
- condition 11 to revise, make publicly available, and implement the Noise Management Plan submitted with the ERMP to reasonably demonstrate that the design of the third production unit would include all reasonable and practical measures to control noise emissions
- other conditions that are not relevant to Alcoa's proposed changes under s. 46.

Assessment of the requested change to conditions

The EPA considered that *Environmental Factor Guideline – Social Surroundings* (EPA 2016) is the current environmental policy and guidance relevant to its assessment of the proposal for this factor.

Condition 11 – Noise

Alcoa initially proposed deletion of condition 11 from MS 728 and MS 1069, as to remove perceived regulatory duplication with its regulation 17 approval. However, following advice from DWER that condition 11 is not duplicative, it was agreed that the condition should be retained with minor amendments for consistency with the proposed changes to conditions 8 and 9.

Regarding expansion of the refinery to 3.3 Mtpa, DWER provided the EPA with technical advice.

DWER advised that, as part of any Works Approval and/or Licence application Alcoa should demonstrate noise levels associated with the works for production at 3.3 Mtpa do not exceed the approved levels as set out in the regulation 17 approval. In addition, DWER advised that Alcoa demonstrate no increase on a noise source cluster level for all portions of the refinery subject to a Works Approval and/or Licence, both in isolation and in the context of the whole refinery.

The EPA notes that, whilst not necessarily relevant to the minor changes proposed to condition 11, Alcoa should consider the above during the Works Approval and/or Licence application process under Part V of the EP Act for the Wagerup Refinery Efficiency Project.

The EPA considers the proposed minor changes to condition 11 are administrative and for consistency with the proposed changes to conditions 8 and 9. The EPA supports the minor amendments.

Based on the information above, the EPA recommends the following changes to condition 11 of MS 728 and MS 1069:

- minor changes to conditions 11-1, 11-2 and 11-3 for consistency with changes to conditions 8 and 9, and contemporisation.

4.3 Inland Waters

The EPA's environmental objective for Inland Waters is *to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*.

Conclusions from EPA Report 1215

Inland Waters (previously Groundwater Quality, Surface Water Quality and Water Supply) was not considered as a key environmental factor for the revised proposal.

Appendix 3 of Report 1215 summarises the EPA's analysis regarding Inland Waters, noting that matters relating to water use are appropriately managed in accordance with Alcoa's existing Water Licence under the RIWI Act. The EPA further noted that potential groundwater contamination impacts would be appropriately managed in accordance with the Part V Licence. The EPA did not recommend conditions relating to Inland Waters.

Report 1215 received 50 appeals during the appeals process, including matters related to water use and groundwater contamination (Appeal No. 06/007-056). Appellants expressed concern regarding an increase in water usage resulting from the proposed expansion and contended the EPA's decision to not include Inland Waters as a key environmental factor (OAC 2006). The then Minister for Environment allowed the appeals in part, concluding that a condition should be imposed on Alcoa to prepare and implement a detailed water use minimisation program (State of Western Australia 2006). This decision led to the inclusion of condition 12 of MS 728.

Assessment of the requested change to conditions

The EPA considered that *Environmental Factor Guideline – Inland Waters* (EPA 2018) is the current environmental policy and guidance relevant to its assessment of the proposal for this factor.

Condition 12 – Water Use

Alcoa proposes to delete condition 12 of MS 728 and MS 1069 to remove regulatory duplication with the requirements of its Water Licence under the RIWI Act.

Condition 12 requires Alcoa to prepare, implement, and make publicly available a Water Use Management Plan to describe its water use minimisation and re-use practices to achieve minimum practicable water use at the refinery.

As stated above, the then Minister for Environment provided condition 12 of MS 728, noting in his appeals decision "a condition should be imposed which requires Alcoa to prepare and implement a detailed water minimisation program to ensure that water usage associated with the expanded refinery is further minimised and in particular, additional opportunities for water use minimisation and reuse are adopted" (OAC 2006).

The EPA sought technical advice from DWER regarding Alcoa's request to delete condition 12.

DWER advised that, in accordance its Water Licence, Alcoa is required to have an approved Operating Strategy to address water use efficiency for the refinery. DWER noted that it is currently in the process of finalising the latest version of Alcoa's Operating Strategy, however the document is suitable to demonstrate that water use efficiency is effectively managed at the refinery and will continue to be effectively managed for production at 3.3 Mtpa.

Based on this advice, the EPA considers that an approved Operating Strategy effectively fulfills Alcoa's requirement to implement a detailed water use minimisation program, and therefore considers condition 12 is duplicative of the requirements of its Water Licence.

The EPA recommends condition 12 of MS 728 and MS 1069 can be deleted, as water use efficiency is appropriately managed at the refinery, and will continue to be appropriately managed for expansion to 3.3 Mtpa and beyond, through the provisions of Alcoa's Water Licence under the RIWI Act.

4.4 Other Changes

Alcoa proposes minor changes to condition 4, procedure 1 and note 4 of MS 728 and MS 1069 to ensure consistency with the proposed changes to conditions 8 and 9, and to remove outdated references.

Condition 4 relates to the time limit for implementation of the revised proposal and was changed by MS 1069 to refer only to the upper limit expansion of a third production unit to 4.7 Mtpa. Initially, Alcoa proposed to amend condition 4 again to refer specifically to the expansion works to 3.3 Mtpa.

The EPA considers it unnecessary to explicitly put a timeframe on commencement of the expansion works to 3.3 Mtpa as Alcoa already operates the refinery under MS 728 and MS 1069. The EPA has recommended condition 4 from MS 1069 is retained in the new statement.

The EPA considers the proposed changes to procedure 1 and note 4 are administrative, and for consistency with the proposed changes to conditions 8 and 9. The EPA supports the minor amendments to condition 4, procedure 1 and note 4 of MS 728 and MS 1069.

5. Conclusions and Recommendations

Alcoa has requested changes to conditions 8 and 9 of MS 728 and MS 1069 to achieve an increase in production at the refinery to 3.3 Mtpa without triggering the upper limit expansion to 4.7 Mtpa.

The EPA notes that there would be no net increase in VOC or odour emissions at the refinery for production up to 3.3 Mtpa, and that Alcoa would be required to demonstrate appropriate emissions reductions through a comprehensive, targeted program as part of condition 8-1A.

The EPA considers the changes are appropriate as Alcoa already has approval to 4.7 Mtpa, and as proposed, production at 3.3 Mtpa is unlikely to result in emissions different to those previously assessed through the ERMP.

The EPA has concluded that the proposed production rate of 3.3 Mtpa does not present any additional environmental impacts to those assessed as part of the ERMP in Report 1215.

Alcoa has also requested minor changes to conditions 4, 10 and 11, procedure 1 and note 4 to ensure consistency with the proposed changes to conditions 8 and 9, and to remove outdated references.

The EPA considers the minor changes are appropriate as they are administrative in nature and for consistency with the proposed changes to conditions 8 and 9.

Alcoa has requested the deletion of condition 12 of MS 728 and MS 1069 to remove regulatory duplication with the requirements of the water licence under the RIWI Act.

The EPA considers the change is appropriate as water use efficiency is appropriately managed at the refinery, and will continue to be appropriately managed up to 3.3 Mtpa and beyond, through the provisions of Alcoa's water licence under the RIWI Act.

Conclusions

In relation to the environmental factors, and considering the information provided by the proponent and relevant EPA policies and guidelines, the EPA concludes that:

- there is no significant new or additional information that changes the conclusions reached by the EPA under any of the relevant environmental factors since the proposal was assessed by the EPA in Report 1215 (January 2006)
- no new significant environmental factors have arisen since the EPA's original assessment of the proposal
- impacts to the key environmental factors are considered manageable, based on the requirements of the original conditions retained in MS 728 and the imposition of the attached recommended conditions (Appendix 1).

Recommendations

Having inquired into this matter, the EPA submits the following recommendations to the Minister for Environment under s. 46 of the EP Act:

1. While retaining the environmental requirements of the original conditions of MS 728, it is appropriate to:
 - change implementation conditions 4, 8, 9, 10, 11, and replace them with new implementation conditions
 - change procedure 1 and note 4, and replace them new a procedure and note
 - delete implementation condition 12.
2. It is appropriate to supersede Ministerial Statement 1069 with a new Ministerial Statement in the manner provided for in the attached recommended statement.
3. After complying with s. 46(8) of the EP Act, the Minister may issue a statement of decision to change conditions 4, 8, 9, 10, and 11, procedure 1 and note 4, and deletion condition 12 of statements 728 and 1069 in the manner provided for in the attached recommended statement (Appendix 2).

References

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Alcoa 2019a, *Wagerup Alumina Refinery – Request for Section 46 Review of Conditions Final Report*, JBS&G Australia Pty Ltd for Alcoa of Australia Ltd, Perth, WA.

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EPA 2020b, *Environmental Impact Assessment (Part IV Division 1 and 2) Procedures Manual*, Environmental Protection Authority, Perth, WA.

EPA 2020c, *Statement of Environmental Principles, Factors and Objectives*, Environmental Protection Authority, Perth, WA.

OAC 2006, *Appeals Report: Appeals Against EPA Report and Recommendations Wagerup Refinery – Increase in Production to 4.7 Mtpa; and the Wagerup Cogeneration Plan (Bulletin 1215)*, Appeals numbers 007 – 056 of 2006, Office of the Appeals Convenor, Perth, WA.

State of Western Australia 2006, *Appeal Decision Summary: Appeal Numbers 008 to 056 of 2006*, Minister for the Environment, Perth, WA.

State of Western Australia 2012, Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012, *Western Australian Government Gazette*, No. 113, 29 June 2012.

State of Western Australia 2016, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016*, *Western Australian Government Gazette*, No. 223, 13 December 2016.

Appendix 1: Identified Decision-Making Authorities and Recommended Environmental Conditions

Identified Decision-Making Authorities

The decision-making authorities (DMAs) in the table below have been identified for the purposes of section 45 as applied by section 46(8) of the *Environmental Protection Act 1986*.

Decision-Making Authority	Legislation (and Approval)
1. Minister for Mines and Petroleum	<i>Mining Act 1978</i>
2. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> (Water abstraction licence)
3. Minister for State Development	<i>Alumina Refinery (Wagerup) Agreement Act and Acts Amendment Act 1978</i>
4. Chief Dangerous Goods Officer, Department of Mines, Industry Regulation and Safety	<i>Dangerous Goods Safety Act 2004</i> (Storage and handling of dangerous goods)
5. Chief Executive Officer, Department of Water and Environmental Regulation	<i>Environmental Protection Act 1986</i> (Works Approval and Licence)
6. Chief Executive Officer, Southern Ports Authority	<i>Ports Authorities Act 1999</i>
7. Chief Executive Officer, Shire of Waroona	<i>Planning and Development Act 2005</i>

Note: In this instance, agreement is only required with DMAs 1, 2 and 3 since these DMAs are Ministers.

Recommended Environmental Conditions

STATEMENT TO CHANGE THE IMPLEMENTATION CONDITIONS APPLYING TO A PROPOSAL

(Section 46 of the *Environmental Protection Act 1986*)

WAGERUP ALUMINA REFINERY – PRODUCTION TO A MAXIMUM CAPACITY OF 4.7 MILLION TONNES PER ANNUM AND ASSOCIATED BAUXITE MINING

Proposal: The construction and operation of the Wagerup Alumina Refinery to a maximum production capacity of 4.7 million tonnes per annum and its associated bauxite mining, as documented in Schedule 1 of Ministerial Statement 728.

Proponent: Alcoa of Australia Limited
Australian Company Number 004 879 298

Proponent Address: 181-205 Davy Street
BOORAGOON WA 6154

Report of the Environmental Protection Authority: 1691

Preceding Statement/s Relating to this Proposal: 728, 897 and 1069

Pursuant to section 45 of the *Environmental Protection Act 1986*, as applied by section 46(8), it has been agreed that the implementation conditions set out in Ministerial Statement No. 728 be changed as specified in this Statement.

The following conditions, procedure and note of Ministerial Statement 728 (as amended by Ministerial Statements 897 and 1069) are deleted and replaced with:

4 Time Limit for Proposal Implementation of the Third Production Unit

4-1 The proponent shall not commence implementation of that portion of the revised proposal being the third production unit after the 27 September 2022, and any commencement, prior to this date, must be substantial.

4-2 Any commencement of implementation of that portion of the revised proposal being the third production unit on or before 27 September 2022 must be demonstrated as substantial by providing the CEO with written evidence, on or before 27 September 2022.

8 Best Practice Pollution Control Measures to be Applied

8-1 As part of any Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for works included in that portion of the revised proposal being the Expansion Works, as documented and described in

Schedule 1 of Ministerial Statement 728, to increase refinery production up to 3.3 million tonnes per annum (Mtpa) the proponent shall prepare and submit a Detailed Design Report that details the best practice pollution control measures employed to minimise emissions from the Wagerup Alumina Refinery (the Refinery).

The Detailed Design Report shall set out the base emission rates for the major sources for the Refinery and the design emission targets for the works. In particular, the Detailed Design Report shall demonstrate that the design of the expansion works achieves to the extent reasonably practicable the following reductions from base emission rates:

- (1) at least a 75% reduction in peak and average emissions rates of Volatile Organic Compounds (VOCs) and odour from slurry storage tanks vents (25A tanks); and
- (2) reduction to negligible emissions of VOCs and odour from calciner vacuum pumps exhaust vents for any new calciner.

Note: the term “base emission” rates for production increases up to 3.3 Mtpa means emissions rates based on the Wagerup Refinery 2018 Emissions Inventory for the production at 2.85 Mtpa.

8-1A As part of any Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for works included in that portion of the revised proposal being the Expansion Works, as documented and described in Schedule 1 of Ministerial Statement 728, to increase refinery production from 3.3 Mtpa up to 4.7 Mtpa, the proponent shall prepare and submit a Detailed Design Report that details the best practice pollution control measures employed to minimise emissions from the Refinery.

The Detailed Design Report shall set out the base emission rates for the major sources for the Refinery and the design emission targets for the expanded works. In particular, the design emission targets in Detailed Design Report shall demonstrate that the design emission targets of the expansion works will reasonably achieve no overall increase in VOC or odour emissions from the Refinery through the application of best practice pollution control measures. The Detailed Design Report shall analyse potential emission reduction measures for the following sources:

- (1) milling vents (building 25);
- (2) seed filtration stacks (building 44);
- (3) filtration tank vents (35A unit) and causticisation tank vents (35J unit);
- (4) sand separation stacks (building 26);

- (5) boilers and turbines stacks (building 110);
- (6) calciner stacks;
- (7) calciner vacuum pumps exhaust vents; and
- (8) 45K cooling towers.

Note: the term “base emission” rates for production increases between 3.3 Mtpa to 4.7 Mtpa means emissions rates based on the Wagerup Refinery Emissions Inventory, as updated and approved by the CEO.

- 8-1B The proponent shall make the VOC and odour emissions rates, as set out in the Detailed Design Reports required by conditions 8-1 and 8-1A, publicly available in a manner approved by the CEO.
- 8-2 The Detailed Design Reports required by conditions 8-1 and 8-1A shall address how the design emission targets in conditions 8-1 and 8-1A will be met during stable operations. The Detailed Design Reports shall also address how best practice will be applied to minimising emissions during unstable operating conditions such as during shut-downs, start-up, and equipment failure.
- 8-3 In the case where best practice pollution control measures do not achieve the individual reductions in base emission rates in condition 8-1 and 8-1A, the Detailed Design Report required by the condition shall provide alternative measures to achieve equivalent overall reductions.
- 8-4 Detailed Design Reports referred to in conditions 8-1 and 8-1A shall be subject to independent peer review (refer to Procedure 1).
- 8-5 Notwithstanding the requirements of conditions 8-1, 8-1A, 8-2, 8-3 and 8-4, the proponent may implement individual works of this proposal, as described in Schedule 1 of this Statement, subject to the requirement of a Works Approval and/or Licence under Part V of the *Environmental Protection Act 1986*, on the *proviso* that the individual works:
- (1) have effect in reducing or offsetting air emissions (including odour) from the existing refinery, where practicable; and
 - (2) do not significantly increase the production capacity of the refinery.

Notes:

1. Best practice pollution control measures include technology, practices, and equipment which are:
 - proven reliable in full-scale operation and applied in similar application to achieve lower emissions; and

- reasonable and practicable given the level of emissions and risk of health and/or amenity impacts from emissions.
2. A significant increase is defined as more than a 5% increase on the assessed annual production capacity for the Licence for the refinery (as amended) under Part V of the *Environmental Protection Act 1986*, but in any event not greater than the approved annual alumina production as defined in Schedule 1 of Ministerial Statement 728.

9 Air Dispersion Model Validation

9-1 Prior to submitting a Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for works included in that portion of the revised proposal being Expansion Works, as documented and described in Schedule 1 of Ministerial Statement 728, to increase production to 3.3 Mtpa, the proponent shall carry out data acquisition and investigations for the purpose of validation of air dispersion model predictions of ground level concentrations in the Environmental Review and Management Program (May 2005) and associated documents, to the requirements of the CEO.

The data acquisition and investigations shall include:

- (1) twelve (12) months of meteorological data from an escarpment meteorological station;
- (2) twelve (12) months of vertical profile temperature and wind velocity measurements using methods acceptable to the CEO;
- (3) twelve (12) months of meteorological data (wind speed, direction and temperature) from up to two (2) additional meteorological stations located on the Swan Coastal Plain, using methods and at locations acceptable to the CEO;
- (4) investigation into the validity of the building wake dispersion scheme used in the air dispersion model, by a suitable qualified modeller;
- (5) investigation into the validity of modelled multiflued plume rise behaviour, in light of recent findings reported in literature, by a suitable qualified modeller; and
- (6) twelve (12) additional months of base case emissions rate data for key sources.

Note: the “key sources” referred to in condition 9-1 are the liquor burner, calciners, 25A tank vents, 35A tanks, 35J tanks and cooling towers.

9-1A Prior to submitting a Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for works included in that portion of the revised proposal being the Expansion Works, as documented and described in

Schedule 1 of Ministerial Statement 728, to increase refinery production from 3.3 Mtpa up to 4.7 Mtpa, the proponent shall carry out data acquisition and investigations for the purpose of validation of air dispersion model predictions of ground level concentrations in the Environmental Review and Management Program (May 2005) and associated documents, to the requirements of the CEO.

The data acquisition and investigations shall include:

(1) additional investigation of techniques and approaches for measurement and assimilation of vertical wind velocity measurements into the Wagerup air dispersion model using methods acceptable to the CEO.

9-2 The proponent shall make use of the results of the data acquisition and investigations, referred to in conditions 9-1 and 9-1A to:

(1) validate the performance of the dispersion model; and

(2) provide details on whether ground level concentrations predicted with the updated air dispersion model and design emission targets set out in the Detailed Design Reports referred to in conditions 8-1 and 8-1A are consistent with the predictions presented in the Environmental Review and Management Program (May 2005) and associated documents, both in the near field and the far field, up to ten (10) kilometres from the multiflued stacks.

This work shall be carried out to the requirements of the CEO.

9-3 In the case that the validation of the dispersion modelling, referred to in condition 9-2, does not reasonably demonstrate ground level concentrations consistent with those predicted in the Environmental Review and Management Program (May 2005) and associated documents will be achieved, the proponent shall make revisions to the detailed engineering design and repeat the air dispersion modelling until reasonable achievement is demonstrated.

9-4 Notwithstanding the requirements of conditions 9-1, 9-1A, 9-2 and 9-3, the proponent may implement individual works of this proposal, as described in Schedule 1 of this Statement, subject to the requirement of a Works Approval and/or Licence under Part V of the *Environmental Protection Act 1986*, on the *proviso* that the individual works:

(1) have effect in reducing or offsetting air emissions (including odour) from the existing refinery, where practicable; and

(2) do not significantly increase the production capacity of the refinery.

Note: A significant increase is defined as more than a 5% increase on the assessed annual production capacity for the Licence for the refinery (as amended)

under Part V of the *Environmental Protection Act 1986*, but in any event not greater than the approved annual alumina production as defined in Schedule 1.

10 Operational Performance Verification

10-1 Prior to submitting a Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for any works included in that portion of the revised proposal being the Expansion Works, as documented and described in Schedule 1, the proponent shall prepare and submit an Air Quality Management Plan/s for those works to the satisfaction of the CEO.

The Air Quality Management Plan/s shall include:

- (1) an emission and ambient air quality monitoring program, for performance verification monitoring, that addresses emissions monitoring for the works and ambient air quality, including where practicable and appropriate, continuous monitoring; and
- (2) management procedures with the objective of achieving the design emission targets referred to in conditions 8-1 and 8-1A for the works under stable operating conditions, and minimising emissions during unstable operating conditions such as during start-up, shut down and equipment failure as referred to in condition 8-2.

Note: During the development of the Air Quality Management Plan/s, the proponent must consult with community and stakeholders.

10-2 The Air Quality Management Plan/s referred to in condition 10-1 shall be subject to independent peer review (refer to Procedure 1) as required by the CEO.

10-3 The proponent shall implement the Air Quality Management Plan/s referred to in condition 10-1 throughout the commissioning and operational phase of each Refinery expansion.

10-4 The proponent shall make the Air Quality Management Plan/s referred to in condition 10-1 publicly available to the requirements of the CEO.

10-5 In the case that the performance monitoring referred to in condition 10-1 indicates that the design emission targets referred to in the Detailed Design Reports required by conditions 8-1 and 8-1A and the management procedures referred to in condition 10-1 are not being reasonably achieved, the proponent shall make revision to the operational procedures and/or engineering design to ensure compliance with the design emission targets.

10-6 The proponent shall regularly review and, where appropriate, employ adaptive management practices to facilitate continuous improvement in key source emissions management at the Refinery in line with current best practice management.

Note: It is expected that the outcomes of condition 10-6 will be implemented through Part V of the *Environmental Protection Act 1986*.

10-7 Notwithstanding the requirements of conditions 10-1, 10-2, 10-3, 10-4, 10-5 and 10-6, the proponent may implement individual works of this proposal, as described in Schedule 1 of this Statement, subject to the requirement of a Works Approval and/or Licence under Part V of the *Environmental Protection Act 1986*, on the *proviso* that the individual works:

- (1) have effect in reducing or offsetting air emissions (including odour) from the existing refinery, where practicable; and
- (2) do not significantly increase the production capacity of the Refinery.

Note: A significant increase is defined as more than a 5% increase on the assessed annual production capacity for the Licence for the refinery (as amended) under Part V of the *Environmental Protection Act 1986*, but in any event not greater than the approved annual alumina production as defined in Schedule 1.

11 Noise

11-1 As part of any Works Approval and/or Licence application (under Part V of the *Environmental Protection Act 1986*) for any works included in that portion of the revised proposal being the Expansion Works, as documented and described in Schedule 1 of Ministerial Statement 728, the proponent shall submit a Noise Management Plan for those works to provide detail on all reasonable and practicable measures to control noise emissions incorporated in design and construction of the expansion works, to the requirements of the CEO.

The Noise Management Plan shall include details of:

- (1) all significant noise sources, options considered for noise control, noise control measures proposed to be adopted and design target Sound Power Levels relevant to the works;
 - (2) acoustic modelling of noise emission levels in the surrounding environment utilising the design target Sound Power Levels relevant to the works;
 - (3) procedures for verifying that the design target Sound Power Levels have been achieved and total noise emissions from the works meet those predicted in the acoustic modelling undertaken in respect of condition 11-1(2); and
 - (4) parties engaged in the design, acoustic modelling and noise verification as covered by conditions 11-1(1) to 11-1(4).
- 11-2 The proponent shall make the Noise Management Plan required by condition 11-1 publicly available to the requirements of the CEO.

11-3 The proponent shall implement the Noise Management Plan required by condition 11-1 to the requirements of the CEO.

11-4 Notwithstanding the requirements of conditions 11-1, 11-2 and 11-3, the proponent may implement individual works of this proposal, as described in Schedule 1 of this Statement, subject to the requirement of a Works Approval and/or Licence under Part V of the *Environmental Protection Act 1986*, on the *proviso* that the individual works:

(1) have effect in reducing or offsetting air emissions (including odour) from the existing refinery, where practicable; and

(2) do not significantly increase the production capacity of the Refinery.

Note: A significant increase is defined as more than a 5% increase on the assessed annual production capacity for the Licence for the Refinery (as amended) under Part V of the *Environmental Protection Act 1986*, but in any event not greater than the approved annual alumina production as defined in Schedule 1 of Ministerial Statement 728.

Condition 12 of Ministerial Statement 728 (as amended by Ministerial Statement 897 and 1069) is deleted.

Procedures

1. The Department of Water and Environmental Regulation, in consultation with the proponent, will establish an Independent Design Review Team (IDRT) including specialists in design, construction, commissioning and monitoring of large industrial plants and pollution control equipment. The IDRT shall seek specialist input from international experts where required.

The IDRT will review the engineering design details for the Wagerup Expansion Works leading to the Works Approval and/or Licence application to advise the Department of Water and Environmental Regulation on whether the design meets international best practice in terms of pollution control, predicted emissions and emissions management and is reasonably likely to achieve the emissions performance levels specified in condition 8.

The IDRT will also review the Air Quality Management Plan/s required in condition 10 to ensure that the monitoring and management is undertaken in accordance with international best practice.

Notes

4. The proponent is required to apply for a Works Approval and/or Licence for this proposal under the provisions of Part V of the *Environmental Protection Act 1986*. The Works Approval and/or Licence application is to include the Detailed Design Reports referred to in conditions 8-1 and 8-1A and the Air Quality Management

Plan referred to in condition 10-1, which will be considered in preparation of the Works Approval and Licence.

5. CEO is the Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his delegate.