



Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number W6167/2018/1

Applicant Cockburn Cement Limited

ACN 008 673 470

File Number DER2018/001321

Premises Cockburn Cement Limited Munster

Being Lot 450 on Plan 249735 Rockingham Rd, Lot 50 on Diagram 6065, Lot 88 on Plan 22127, Lot 246 on Plan 226117, Lot 5 and Lot 4 on Diagram 18525 and Lot 311 on Plan 300770 Russell Road, MUNSTER WA 6166
As defined by the Premises map in Appendix 1

Date of Report FINAL (25 January 2019)

Scope

On 15 August 2018, Cockburn Cement Limited (CCL) applied to the Department for a works approval to carry out a trial of an odour neutralising product that would be injected into the stack to reduce odour.

This works approval is related to the trial use of the odour neutralising product on the first two stages of the three stage trial proposed by CCL.

Overview of premises

Classification of premises

Classification of Premises	Description	<i>Approved Premises production or design capacity or throughput</i>
12	Screening etc. of material	1,000,000 tpa
43	Cement or lime manufacturing	Kilns 3 & 4: 500,000 tpa
		Kilns 5 & 6: 1,500,000 tpa
		Milling (cement): 900,000 tpa
61A	Solid waste facility	5,000 tpa
63	Class I Inert Landfill	247,500 tpa

Background

CCL holds Licence L4533/1967/15 under Part V of the *Environmental Protection Act 1986* (EP Act) for its cement and lime manufacturing premises in Munster.

The premises has the infrastructure to produce quicklime and cement clinker which is supplied to the mining, agriculture and construction industries. Kilns 3 and 4 were previously operated to produce cement clinker; however, these kilns were placed into care and maintenance in December 2014 and February 2014 respectively.

Current operations consist of two lime kilns, Kilns 5 and 6, as well as other processes and infrastructure associated with lime production. The lime manufacturing process is summarised below.

1. Dredged shell sand is washed at the Woodman Point washing plant. The washed shell sand is mixed with groundwater and transferred by pipeline to the Munster facility.
2. The shell sand is stockpiled prior to processing in the lime kilns.
3. Shell sand is transferred to kiln storage hoppers which feed the preheater towers of Kiln 5 or Kiln 6.
4. The shell sand is transformed in the kilns into lime. The kilns are fired by a mixture of coal and natural gas.
5. The lime is cooled and transferred to storage silos before dispatch from site by road tankers.
6. Process waste gases are treated by baghouses fitted on each kiln (for the removal of dust) prior to discharge to the atmosphere.

As required by conditions of a previous version of the licence, CCL commissioned an independent consultant to conduct a Community Odour Survey between January 2013 and March 2014. The survey results were submitted to the Department on 14 August 2014.

The Department reviewed the Community Odour Survey results and did not support all the conclusions drawn from the report. The Department amended CCL's licence on 30 March 2015 and included conditions to identify whether certain odorous compounds are present in emissions from the facility. The Odour Verification Plan Final Report was submitted to the Department on 28 August 2015.

The Department conducted an air quality study in the City of Cockburn at the same time as CCL's Odour Verification Plan. This also investigated the impact of potentially odorous compounds at ground level.

The Department formed the view from information obtained in the Community Odour Survey, Odour Verification Plan and the Department's air quality study that CCL is causing odour amenity impacts on the community. This data informed a review of CCL's licence which was conducted in accordance with the Department's published Regulatory Framework.

Following the review, the Department granted an amended licence to CCL on 12 December 2016, which included additional and updated emissions controls, including odour controls. The conditions of the amended licence were appealed by CCL and third parties. The Minister for Environment determined the appeals on 5 December 2018 and the Department issued an amended Licence to CCL on 11 January 2019. The amended Licence allows the Minister's determination to have effect. The decision reports associated with the licence and licence amendment notices describe the premises history and activities, the risks associated with emissions and discharges, and the controls that are in place in more detail.

The existing licence and the licence issued on 12 December 2016, including the decision report, and odour reports referenced above, are available on the Department of Water and Environmental Regulation's website (www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences).

Description of proposed activity

CCL proposes to trial an odour neutralising product, Aireactor OWD™, which will be injected into the stack exhaust gasses of Kilns 5 and 6 to reduce the potential odour impact at ground level.

The product will be supplied to the premises undiluted and will be mixed with water and introduced to the kiln stacks through a spray system, ensuring the product is well distributed and mixed with the stack gasses.

The product is referred to as osmogenic barrier technology, which is not a deodorant that replaces one odour with another, but a neutraliser that encapsulates and blocks malodorous compounds so they are not able to be detected.

CCL provided technical data and material safety data sheets for the product which state the product is not classified as hazardous to the environment (noting that occupational health and safety and environmental precautions must be taken when handling the product in its concentrated form). DWER referred the use of the Aireactor OWD™ to the Department of Health (WA), who stated if the product is used as proposed it is not anticipated that it would pose an unacceptable risk to public health.

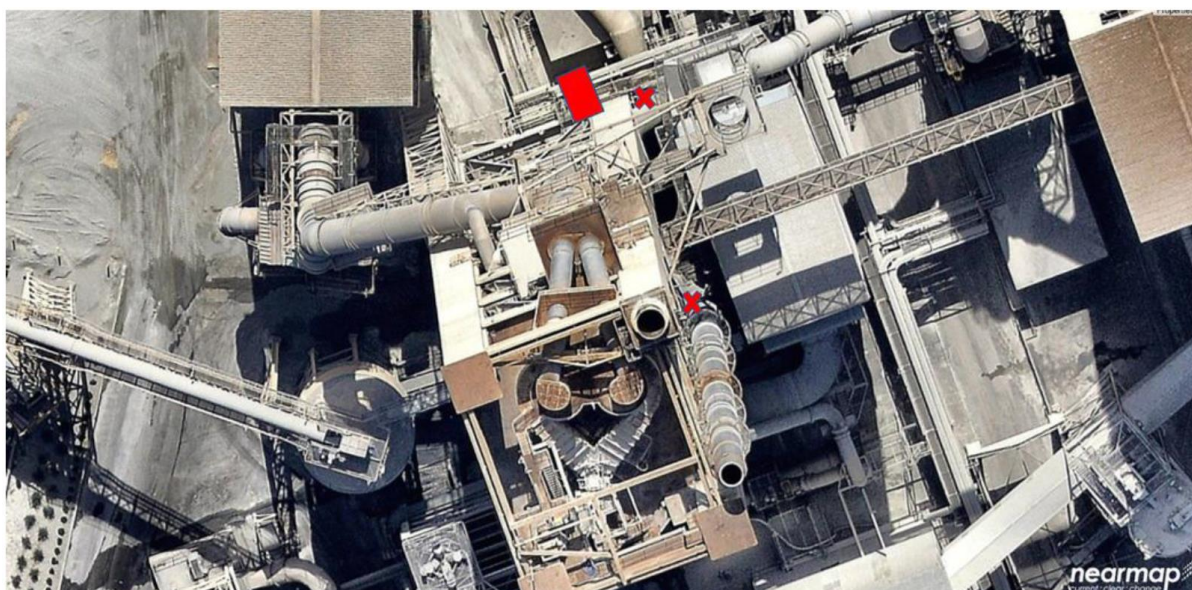
The odour neutralising trial is proposed to be conducted in three trial stages as shown in Table 1 below.

The Delegated Officer has assessed the first two trial phases below. It was determined that the implementation of the third stage is to be assessed following the completion of the first two trial periods. This will enable the risk of a longer term trial use of the Aireactor OWD™ to be more

thoroughly assessed once its use has been tested over the first two trial periods. This will also allow for CCL and DWER to agree on a suitable odour survey to determine the effectiveness of the use of the product.

Table 1: Proposed trial phases

Ref	Infrastructure / activity	Site Layout Plan Reference																														
-	Installation of a 1000L storage Intermediate Bulk Container (IBC), isolation valve; flow control valve; pump and spray nozzle bar, post pollution control equipment on Kiln 5 and Kiln 6.	Figure 1																														
1	<p>Commissioning of injection system - up to 96 hours; day shift only (maximum 48 hours operation).</p> <p>Objective - to commission the injection system and trial the different addition rates as shown below.</p> <p>Kiln 5 addition rates</p> <table><tr><td>Injection rate (L/min)</td><td>10</td><td>10</td><td>10</td><td>10</td></tr><tr><td>Dilution ratio of product in water</td><td>1:0.0006</td><td>1:0.001</td><td>1:0.0015</td><td>1:0.002</td></tr><tr><td>% product in stack</td><td>0.00001</td><td>0.00002</td><td>0.00003</td><td>0.00004</td></tr></table> <p>Kiln 6 addition rates</p> <table><tr><td>Injection rate (L/min)</td><td>10</td><td>10</td><td>10</td><td>10</td></tr><tr><td>Dilution ratio of product in water</td><td>0.0006</td><td>0.001</td><td>0.0015</td><td>0.002</td></tr><tr><td>% product in stack</td><td>0.000007</td><td>0.000012</td><td>0.000018</td><td>0.000024</td></tr></table> <p>Testing - samples taken of the stack gasses and odour concentration determined by olphactometric testing and compared to baseline conditions.</p>	Injection rate (L/min)	10	10	10	10	Dilution ratio of product in water	1:0.0006	1:0.001	1:0.0015	1:0.002	% product in stack	0.00001	0.00002	0.00003	0.00004	Injection rate (L/min)	10	10	10	10	Dilution ratio of product in water	0.0006	0.001	0.0015	0.002	% product in stack	0.000007	0.000012	0.000018	0.000024	-
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2	<p>Stack testing of the optimal addition rate - 48 hour period; day shift only (maximum 24 hours of operation).</p> <p>Objective - run at the optimum addition rate determined in Stage 1 above.</p> <p>Testing - stack emission testing, as per the previous licence (L4533/1967/15) Condition 37 (bi-annual requirement).</p>	-																														
3	Extended continuous use for a period of 3 to 6 months (<u>not approved as part of this works approval</u>)	-																														



Legend

- Bund area for bulk neutraliser, dosing system, storage tank and pumps
- ✕ Location of injection points on stack (Far, Kiln 6), (Near, Kiln 5)

Figure 1 – location of odour neutralising trial equipment

Emissions and discharges

Refer to Figure 1 above and Premises map in Appendix 1.

Ref	Source	Emission	Controls
Kiln 5 stack	Injection of product into stack (post baghouse)	Product mixed with combustion gases (including odour)	Process controls –
Kiln 6 stack			<p>Low dilution ratio in water</p> <p>Low injection rate of 10L/minute into stacks (in comparison to stack gas flow)</p> <p>Dosing and injection systems linked to Plant Control System (PCS) with process parameters and alarmed logic controls</p> <p>Injection of product mix during normal, stable kiln operation only (PCS control)</p> <p>Monitoring –</p> <p>Olphactometric testing during Stage 1</p> <p>Stack emission testing during Stage 2</p>

Environmental siting

Refer to Map of distance to residential receptors in Appendix 1.

Residential and sensitive receptors and distance from activity boundary

Land Use/Zoning	Direction from plant	Population
Mixed use: market gardens, nursery, residential and commercial Zoned rural	Immediately adjacent along the extent of the eastern premises boundary, extending south approximately 600-800m from kiln stacks and processing area	Workers at 7-10 commercial properties and less than 10 residential dwellings. Note some commercial properties are also residential
Recreation and education/training facilities Zoned special use	Immediately adjacent west of the premises boundary and 730m west of the processing area	Transient receptors depending on people utilising recreational area and attending education/training facilities. Exposure at these locations is likely short term but variable
Residential Zoned rural living and development	Immediately north-west of the premises boundary and approximately 800-900m north-west of the processing area	Encompasses residential areas of varying density. 50+ receptors
Residential, recreation and primary school. Zoned rural living, residential and development	Immediately adjacent north of premises boundary and approximately 550m north of processing area. Primary school is approximately 1.4km north of processing area	Encompasses residential areas of varying density. 100+ residential receptors. Primary school and recreation area has transient receptors depending on people utilising recreational area and children attending school
Residential. Zoned development	Approximately 670m north of premises boundary and 1.5km north-north east of processing area	Area is transitioning into a residential area. A number of subdivisions are underway. 50+ current residential receptors
Residential and recreation Zoned residential and development	Approximately 410m north-east of premises boundary and 1.3km north-east of processing area	Large residential area which encompasses Meve` estate. 100+ receptors
Residential Zoned residential	Approximately 1.2km north-east of premises boundary and 2.3km north-east of processing area	Large residential area which encompasses Meve` estate. 100+ receptors
Residential Zoned rural	Approximately 630m east-south-east of premises boundary and 1.1 km east-south-east of processing area	Rural residential area. 30+ receptors

Risk assessment

Risk assessment – trial operation

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/ Activities	Potential emissions	Potential receptors	Potential pathway & receptor (impact)	Applicant controls					
Storage of 1000L of product	Spill or leak of product	Ground or surface water	Direct contact or leakage/seepage over and through ground causing pollution of land and/or waters.	1000L maximum of product will be stored on the premises in a bunded area to contain any spills or leaks. Spill kits maintained in vicinity	Slight	Unlikely	Low	Applicant controls Product is biodegradable and not classified as hazardous to the environment.	Infrastructure
Injection of product into Kiln 5 and Kiln 6 stacks	Combustion gases combined with product mixture	Residential areas	Dispersion of emission plume in air causing health impacts on receptors	Low dilution ratio in water Low injection rate Operation by PCS Olfactometric and stack emission monitoring	Minor	Rare	Low	Applicant controls Product harmless to humans Injection rate will decrease stack temp. marginally (<5°C) which will not impact plume dispersion Product injection rate will increase moisture in the stack emissions by approximately 0.5%.	Injection rate Dilution ratio Monitoring Notification Reporting
			Injected water mist mixing with acid gases to create acid droplets causing health impacts on receptors.						
			The potential for acid rain generation that has health and physical impacts on receptors.						
Injection of product into Kiln 5 and Kiln 6 stacks	Combustion gases (odour) combined with product mixture	Residential areas	Dispersion of emission plume in air causing amenity impacts on receptors		Minor	Rare	Low	Applicant controls Product harmless to humans Product designed to reduce odour emissions	Injection rate Dilution ratio Monitoring Notification Reporting

DWER consultation

Method	Comments received	DWER response
3 September 2018: Application advertised on DWER website.	Refer to Appendix 2	Refer to Appendix 2
3 September 2018: Application advertised in the West Australian newspaper.		
3 September 2018: Direct interest stakeholders notified.		
18 September 2018. Department of Health (DOH) (Environmental Health Directorate) consulted.	<p>The DOH reviewed the proposal and noted that the product is composed of ingredients similar to those found in essential oils and will be used in a diluted form. The DOH does not anticipate that the product would pose an unacceptable risk to public health. Existing stack emission testing for particulates, sulphur dioxide and volatile organic compounds are considered sufficient to monitor its use.</p> <p>The DOH also noted that a significant amount of water will be added to dilute the product and that it will be delivered using a misting distribution bar. The potential for increased visible water vapour/steam emission from the stacks has not been discussed. If likely, this would require consideration as part of the communication strategy to address perception issues from potential visible changes in stack emissions.</p>	<p>The DoH's assessment of the product has been noted by the Delegated Officer in the assessment.</p> <p>Although water is the major part of the product mixture to be injected into the stacks, it is minor in terms of moisture addition to the stack. CCL estimate that the increase in moisture content of the stack gases would be less than 0.5% with a corresponding decrease in temperature of less than 5°C.</p> <p>It is therefore considered unlikely that there will be any change in plume visibility resulting from the injection of the product.</p>
21 December 2018: Applicant notified of draft	Refer to Appendix 2	Refer to Appendix 2

Conclusion

This assessment of the risks of activities on the premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this decision report (summarised in Appendix 3).

This assessment was also informed by a site visit by DWER officers on 5 September 2018 and 12 September 2018.

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

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

James Milne

A/ Senior Manager Process Industries

Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Premises map



Distance to receptors map



Appendix 2: Summary of consultation comments

Application consultation

Person	Comment	DWER response
Cockburn Pollution Stoppers	The local community opposes the trial.	Noted
	The product will not reduce the emissions profile of CCL.	The use of the product is aimed at minimising odour emissions only and not any other emission parameters.
	There are more effective ways of reducing or eliminating odours, principally by burning natural gas and not coal, filtering groundwater and using potable water to wash the shell sand, and by installing pollution reduction technology.	<p>The works approval application is focussed on the trial use of an odour neutralising agent and not the fuel used at CCL.</p> <p>There is no current requirement for CCL to exclusively burn gas and CCL has not made any such proposal.</p> <p>Emissions from the burning of coal are regulated under Licence L4533/1967/15.</p>
	If the trial is conducted, DWER should mandate that CCL conduct a 90 day trial using only natural gas.	
	The product is not designed for, or intended to be used for, the purpose proposed by CCL.	<p>The risk of CCL trialling the product for the trial periods as outlined in their application has been assessed as low risk.</p>
	There is no satisfactory evidence that the product is certified for use in gaseous emission streams from kilns or other large production facilities.	
	Evidence submitted by CCL is limited to one Italian based case with poor regulatory compliance history	
	There is anecdotal evidence that the product is ineffective; and there is no satisfactory evidence or explanation as to how the product will work in a continuous high volume stream of gases and what compounds will be emitted from the stacks as a result of the use of the product.	

Person	Comment	DWER response
	There is no adequate information in the application as to the constituents of the product	CCL supplied the material safety data sheets for the product.
	There is no adequate information provided in the application as to the risk the product may pose to human health and to the environment.	The Department of Health has advised DWER that the use of the product as proposed is not likely to cause a risk to human health. Stack monitoring is required during the trial periods to determine if there is any change to the emission profile.
	As the product will be put to an unauthorised use in an unauthorised manner, there are potentially a range of unintended consequences which are likely to aggravate the risks posed to human health.	The Works Approval authorises the use of the product as proposed in the application for two trial periods. The Works Approval only allows the use of the product in dilution rates of at or below 1:0.002 (water to Aireactor OWD™). The second trial period requires a stack test at the determined optimum dilution ratio to determine any changes in the air emission profile from the stacks as a result of the use of the product. The results from the stack testing during the second trial period will be used to assess the risk of the third trial stage as well as the effectiveness of the Aireactor OWD™ in reducing odour impacts.
Public respondent 1	Concern over the burning of coal close to residential receptors and the potential impacts on human health	The works approval application is focussed on the trial use of an odour neutralising agent and not the fuel used at CCL. There is no current requirement for CCL to exclusively burn gas and CCL has not made any such proposal. Emissions from the burning of coal are regulated under Licence L4533/1967.
Public respondent 2	Support for finding a solution to odour and dust impacts in the area	Noted
Public respondent 3	Concern over radioactive and heavy metal elements in coal ash (from burning of coal) and dumping of contaminants	See response to Public respondent 1. DWER is not aware of any instances where contaminated material from CCL has been inappropriately dumped.

Person	Comment	DWER response
Public respondent 4	General support for the trial. Concern over health impacts of air quality and that the odour neutraliser will hide the pollution problem	The works approval application is focussed on the trial use of an odour neutralising agent to reduce odours. Odour is not a reliable indicator of ambient air quality (relating to human health) and should not be used as an indicator that air quality will pose a risk to human health.
City of Cockburn	Support for the trial as an effort by CCL to reduce its odour impact on the community	Noted

Applicant consultation

Works Approval / Decision Report section	Summary of applicant comment	DWER response
Works Approval Duration	CCL requested trial period three be include as part of the works approval and the duration of the works approval be extended to 6 months to allow enough time for trial period three.	<p>The works approval duration has been increased to 6 months to allow trial stages one and two to take place and for CCL to submit the relevant results and documentation. Once the results are received DWER will assess the appropriateness of the third stage of the trial.</p> <p>The Delegated Officer has determined that the results from the stack testing during the second trial period will be used to assess the risk of the third trial period.</p>
Condition 4 and Table 3: Trial duration and specification	CCL requested that trial period three be included as part of the works approval to allow CCL to determine the effectiveness of the odour neutraliser in reducing odour impacts at ground level.	<p>Currently it is unknown how the product might change the emissions profile of the stack gases. The stack testing conducted as part of the second trial period will allow the Delegated Officer to more thoroughly assess the risk of on-going use of the Aireactor OWD™.</p> <p>The application for works approval submitted by CCL did not provide sufficient details of how the reduction of odour impact at ground level will be assessed during the third trial period. Prior to the proposed third stage trial use of the product, CCL will need to provide a plan to DWER of how the reduction in odour impacts will be assessed. DWER will consider this information as part of its assessment of how the effectiveness of the proposed third stage would be measured.</p> <p>The Delegated Officer also considered that CCL's Licence (L4533/1967/15) was amended on 11 January 2019 as the result of the Minister for Environment's appeal determination. The amendment includes a condition (condition 18B) to conduct an investigation into the source and cause of odour from the active kilns. The additional information required to adequately assess the third stage must include advice from CCL on how the use of the Aireactor OWD™ will not impact the investigations required by the amended licence.</p>
Condition 6: Submission of stage one and two reports	CCL requested that the requirement for submission of reports following the emission testing conducted during stages one and two be compiled as one report and submitted 6	The timeframe required for the submission of monitoring results has been increased to 42 days (6 weeks).

Works Approval / Decision Report section	Summary of applicant comment	DWER response
	weeks after the completion of trial period two	

Appendix 3: Key documents

Document title	In text ref	Availability
Licence L4533/1967/15	Amended licence	accessed at www.der.wa.gov.au
Licence L4533/1967 (amended 17 March 2016)	Previous licence	
Application and supporting information submitted by CCL	Application	DWER records
Comments received from CCL dated 11 January 2019	-	
DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	-	accessed at www.dwer.wa.gov.au
DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	-	
DER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	-	
DER, February 2017. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	-	