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**ENVIRONMENTAL IMPROVEMENT PROGRAMME (EIP)
QUARTERLY REPORT FOR BIRKENHEAD WORKS
EPA Approved Document no: 1126 EIP Version 1**

**COMPLIANCE DATE: 15/04/2020 - 2019 Annual Report
EPA Licence 1126: Environmental Improvement Programme
(U-583)**

Licensed site: Adelaide Brighton Cement, Birkenhead Works

62 Elder Road, Birkenhead, SA 5015

Date of Submission: 17 April 2020

Version Number: 1



Report Submitted by: Environmental Engineer

I certify that I have reviewed this report and to the best of my knowledge and ability that all the information provided in this report is a true and accurate reflection of the regulatory monitoring.

Purpose	The purpose of the Environmental Improvement Programme (EIP) is to reduce noise and fugitive particulate emissions from the site.
Background Information	<p>In order to reduce its environmental impact, Adelaide Brighton Cement Ltd, has developed an EIP that contains projects to reduce noise and fugitive particulate emissions. These projects were identified from the following inputs:</p> <ul style="list-style-type: none"> • Adelaide Brighton Cement Limited Report, August 2018, “Assessment of Options Report” • Katestone Environmental Report, August 2018 “Birkenhead Cement Plant – Options Assessment Report” • Katestone Environmental Report 2017 “Air Quality Assessment of the Birkenhead Cement Plant” • Vipac Engineers and Scientists Report, August 2018 “Environmental Noise Model Update” • Vipac Engineers and Scientists Report, February 2019 “Noise model update and Abatement Options” <p>Thirteen fugitive particulate and three noise improvement projects were identified and incorporated into an EPA approved EIP.</p> <p>EIP project implementation is tracked through the completion of 52 compliance actions over the life of the EIP.</p> <p>The EIP approved by the EPA on 28 February 2019 is available on the ABC Birkenhead Community Website: http://www.birkenheadcommunity.com.au/</p>
Reporting Objective	<p>Annual EIP progress report providing:</p> <ul style="list-style-type: none"> • Summary of EIP actions completed during the calendar year • A summary of progress on EIP actions <p>To be submitted within 45 days of the anniversary of the EIP approval date, namely 15th April of each year</p>
Annual Report	<p>Seven EIP projects were completed during the reporting period in compliance with the EIP timelines.</p> <p>As the implementation of the EIP is over three years, some of the EIP projects and compliance actions will not have been progressed in the 2019 reporting period and will therefore not appear in the following table which summarises the progress and completion of EIP actions.</p>

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
1	Fugitive Dust - Stockpile emission reduction	Relocate Bauxite Stockpile and cover with Geofabric	1	By the 24/04/2019, ABC will select a suitable Geofabric, determine installation methodology and project costs to enable a business case to be developed for capital expenditure approval.	<p>ABC has researched several suitable Geofabrics, installation methodologies and obtained estimated project costs.</p> <p>In summary:</p> <ul style="list-style-type: none"> • A heavy duty shade cloth material to be used for the stockpile cover – (example photo below)  <ul style="list-style-type: none"> • Stockpile to be covered with six panels of heavy duty shade cloth (15 m x 65 m each) to provide flexibility and safety in covering and uncovering the stockpile • Covers will be applied using a combination of lifting equipment and manual labour • Covers will be anchored using water filled 200 litre drums appropriately spaced <p>A business case and a capital expenditure proposal will be submitted to obtain capital funding by the 23/08/2019.</p>

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
1	Fugitive Dust - Stockpile emission reduction	Relocate Bauxite Stockpile and cover with Geofabric	2	By the 23/08/2019, ABC will obtain capital expenditure approval for the purchase and installation of Geofabric on the Bauxite stockpile to be located at the Southern end of the site.	<p>Capital expenditure approval has been obtained for purchase and installation of Geofabric on the Bauxite stockpile.</p> <p>In summary:</p> <ul style="list-style-type: none"> Relocated Bauxite Stockpile applied with environmentally friendly dust suppression (green) Reduced vehicle movements and dust emissions as stockpile closer to materials handling system <div data-bbox="1350 572 2022 805" data-label="Image"> </div> <ul style="list-style-type: none"> A heavy duty shade cloth material to be used for the stockpile cover – (example photo below) <div data-bbox="1503 916 1850 1177" data-label="Image"> </div> <ul style="list-style-type: none"> Stockpile to be covered with six panels of heavy duty shade cloth (15 m x 65 m each) to provide flexibility and safety in covering and uncovering the stockpile Covers will be applied using a combination of lifting equipment and manual labour Covers will be appropriately anchored

**Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022**

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
1	Fugitive Dust - Stockpile emission reduction	Relocate Bauxite Stockpile and cover with Geofabric	3	<p>Subject to obtaining capital approval by 23/08/2019, ABC will complete implementation of Geofabric on the Bauxite Stockpile at the Southern end of the plant by 18/10/2019</p> <p>Variation: <i>At the time of developing the EIP, ABC was not cognisant of the long lead times associated with the delivery of the material which is sourced from overseas manufacturers and the production timing coinciding with a seasonally related busy period.</i></p> <p><i>A revised completion date of 28/02/2020, and application of chemical dust suppressant to the stockpile as an interim fugitive dust control measure, was approved by the SA EPA.</i></p> <p>Project completed</p>	<p>ABC completed installation of the covers on the relocated Bauxite Stockpile at the Southern end of the plant on 13/02/2020.</p> <ul style="list-style-type: none"> Relocated Bauxite stockpile close to the material handling system reduces vehicle movements and associated fugitive dust. Covering inactive areas of stockpile with heavy duty shade cloth prevents wind erosion and fugitive dust from surface of stockpile. Predicted to reduce maximum 24-hr average concentrations of PM₁₀ at the Community Park by 0.2 µg/m³.  <ul style="list-style-type: none"> Dust suppression (green) applied to stockpile before covers added  <ul style="list-style-type: none"> Bauxite Stockpile with heavy duty shade cloth covers applied

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
2	Fugitive Dust - Stockpile emission reduction	Wind curtain - Limestone stockpile	4	By 27/02/2020, ABC will complete a detailed cost-benefit analysis and technical assessment to enable capital approval to be obtained for the installation of a wind curtain for the limestone stockpile on shell block. The project will proceed if the front-end engineering costs are in line with the project selection criteria.	<ul style="list-style-type: none"> • In line with the EIP – Project 2 scope, ABC obtained budget quotations for a 15 metre high wind fence along the Western perimeter of the limestone stockpile, from two companies that specialise in wind fence technology. • Design, supply and install quotations for wind fences were obtained from the Australian agents for Weather Solve Structures and Dust Solutions Incorporated, “Dust Tamer Wind Fences”. • Proposals received, provided estimated costs for foundations, but noted geotechnical assessments were required to enable final foundation designs for the wind fence to be determined. In addition, the proposals excluded the costs to determine and manage potential impacts of the wind fence on a legacy hydrocarbon plume and High Density Polyethylene (HDPE) barrier on the limestone stockpile site. • ABC’s engineering study has determined that it fails to meet the criteria specified in the EIP for the project to proceed. <p>ABC is currently discussing with the EPA an alternative proposal to use a combination of control measures as follows:</p> <ul style="list-style-type: none"> • Portable wind fencing with a height of 6m and length of 50 m placed near the working face of the stockpile • A sand tarp/mesh fabric placed on 11,500 m² of inactive non working exposed surface areas of the limestone stockpile • Chemical dust suppressant polymers on all stockpile wall surfaces • Increased haul road surface to cover 35% of unsealed exposed areas around the stockpile including unsealed exposed traffic flow/movement areas around the stockpile • Air Quality Consultants (Katestone) have assessed the alternative proposal and found it will provide the same level of reduction of PM₁₀ emissions as the original EIP wind fence proposal

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
3	Fugitive Dust - Stockpile emission reduction	Geofabric – Limestone stockpile	9	By the 30/05/2019, ABC will select a suitable Geofabric, determine installation methodology and project costs to enable a business case to be developed for capital expenditure approval.	<p>ABC has researched several suitable Geofabrics, installation methodologies and obtained estimated project costs.</p> <p>In summary:</p> <ul style="list-style-type: none"> • A heavy duty shade cloth material to be used for the stockpile cover – (example photo below)  <ul style="list-style-type: none"> • In active areas of the stockpile to be covered with panels of heavy-duty shade cloth to provide flexibility and safety in covering and uncovering the stockpile • Covers will be applied using a combination of lifting equipment and manual labour • Covers will be anchored using water filled 200 litre drums appropriately spaced <p>A business case and a capital expenditure proposal will be submitted to obtain capital funding by the 27/09/2019.</p>

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
3	Fugitive Dust - Stockpile emission reduction	Geofabric – Limestone stockpile	10	By 27/09/2019, ABC will obtain capital expenditure for purchase and installation of Geo fabric on the limestone stockpile on the shell block.	<p>ABC has obtained capital expenditure approval for the purchase and installation of geo fabric on the limestone stockpile on the shell block.</p> <p>It is envisaged that the stockpile will have adequate non-working surfaces to complete the installation of Geo fabric on 11,500 m² of inactive stockpile areas by 13/03/2020.</p>

**Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022**

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
3	Fugitive Dust - Stockpile emission reduction	Geofabric – Limestone stockpile	11	<p>Subject to obtaining capital approval by 27/09/2019, ABC will complete the installation of Geo fabric on the 11,500 m² Of inactive stockpile areas by 13/03/2020</p> <p>Variation: Subject to obtaining capital approval by 27/09/2019, ABC will complete the installation of Geo fabric on 11,500 m² of inactive stockpile areas by 30/09/2020.</p> <p>This variation has been accepted by the EPA</p>	<p>ABC has purchased “sand tarps” to cover 11,500 m² of inactive surface area.</p> <p>At the time of preparing the EIP, ABC anticipated 11,500 m² of inactive surface area would be available by the 13th March 2020, to which a cover could be applied. Due to the dynamic nature of the stockpile build, the stockpile is not ready for the complete application of covers on 11,500m².</p> <p>ABC will progressively apply covers as the stockpile build enables this to occur. ABC anticipates application of covers will be completed by 30/9/2020.</p> <p>Installation of covers on 4,080 m² of inactive stockpile area was completed on 18 March 2020.</p>  

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
6	Fugitive Dust – Storage/processing buildings	CM6 CF6 Clinker Transfer Point Dust Collector	20	By 29/08/2019, ABC will complete an engineering design to enable capital approval for selection and installation of a suitable dust collector	<p>ABC has developed an engineering scope of work to reduce dust emissions at the clinker transfer onto Cement Mill 6 (CM6) Clinker Feed conveyor (CF6)</p> <p>Engineering analysis determined the existing dust collector is correctly sized, but dust capture and handling need improvement.</p> <p>The scope of work includes;</p> <ul style="list-style-type: none"> • Redesigned ductwork to provide effective capture of dust at the clinker transfer point • Improved dust collector discharge arrangements <p>These improvements will reduce dust loadings within CM6 building and will lead to lower overall fugitive dust emissions from the building.</p>
6	Fugitive Dust – Storage/processing buildings	CM6 CF6 Clinker Transfer Point Dust Collector	21	By 28/11/2019, ABC will obtain the capital expenditure for the installation of a CM6 CF6 Clinker transfer point dust collector.	ABC has obtained approval for the expenditure necessary to reduce dust emissions at the CM6 CF6 Clinker transfer point.

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)

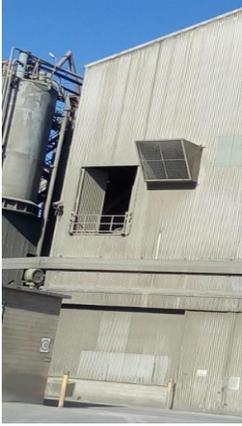
1 March 2019 – December 2022

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
6	Fugitive Dust – Storage/processing buildings	CM6 CF6 Clinker Transfer Point Dust Collector	22	<p>Subject to capital approval by 28/11/2019 and CM6 mill shutdown commencing 14/04/2020, ABC will complete commissioning of dust collection system by 6/07/2020.</p> <p>Variation: Subject to capital approval by 28/11/2019 and CM6 mill shutdown commencing in January 2021, ABC will complete commissioning of the dust collection system by 8/3/2021</p> <p>EPA has accepted the variation.</p>	<p>Due to the COVID-19 pandemic and the need to minimise health risks, the scope of work for CM6 shutdown has been significantly restricted to only those activities critical to ensure ongoing and safe operation of the mill.</p> <p>ABC advises that it is unable to install the dust collection system within the timeframes required by EIP Project 6 (during the CM6 shutdown) and seeks a variation in the completion date for the EIP Project.</p> <p>ABC proposes to install the dust collection system on the next CM6 shutdown which is expected to be during the annual shutdown planned for January 2021.</p> <p>ABC therefore requested a revised completion date of 8/3/2021:</p> <p>EPA has accepted the proposed variation.</p>

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
8	Fugitive Dust - Dust Collectors	CM1 Dust Collector - redirect outlet	26	By 30/07/2019, ABC will complete an engineering design to enable capital approval for changing the CM1 Dust collector outlet to a vertical discharge.	<p>ABC has developed an engineering scope of work to change the CM1 Dust collector out let to a vertical discharge.</p> <p>The design includes:</p> <ul style="list-style-type: none"> • Installing new ducting within the existing mill room building with a smooth radius turn to minimise turbulence • The existing duct attenuator will be overhauled to further mitigate noise emissions
8	Fugitive Dust - Dust Collectors	CM1 Dust Collector - redirect outlet	27	By 31/07/2019, ABC will submit an application to the relevant regulatory authority for redirection of the CM1 Dust Collector outlet.	As the scope of work does not affect the structure or use of the building and considering all the work is being completed internally, building approval is not required.

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
8	Fugitive Dust – Dust Collectors	CM1Dust Collector – Redirect outlet	28	Subject to development approval by 29/10/2019, ABC will obtain the capital expenditure for changing the CM1 dust collector outlet to a vertical discharge by 28/01/2020	<p>ABC has obtained the funding to change the CM1 dust collector outlet to a vertical discharge.</p> <p>ABC plans to complete the installation of the redirected CM1 dust collector outlet in February 2020, as the planned CM1 shutdown has been brought forward from April 2020.</p>
8	Fugitive Dust – Dust Collectors	CM1Dust Collector – Redirect outlet	29	<p>Subject to capital approval by 28/01/2020 and cement mill 1 shut down for maintenance commencing on the 14/04/2020, ABC will complete the installation of the redirected CM1 dust collector outlet by 20/04/2020.</p> <p align="center">Project completed</p>	<ul style="list-style-type: none"> • Funding obtained and changes completed on 04/02/2020, as CM1 shutdown was brought forward from April 2020. • A vertical outlet on the dust collector improves dispersion and is predicted to reduce maximum 24-hr average concentrations of PM₁₀ at the Community Park by 0.45 µg/m³ • Project has also reduced ground level noise on eastern side of CM1 building by 25 dBA <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Horizontal outlet</p> </div> <div style="text-align: center;">  <p>Vertical outlet</p> </div> <div style="text-align: center;">  <p>Vertical outlet through roof</p> </div> </div>

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
9	Fugitive Dust – Sealing exposed unsealed surfaces	Seal area – north of reclaimer shed	30	By the 25/06/2019, ABC will complete the engineering design to enable capital approval for sealing 1200m ² of unsealed surface area on the northern side of the reclaimer shed.	<p>ABC has developed an engineering scope of work and obtained estimated project costs. In summary:</p> <ul style="list-style-type: none"> • 1375 m² of unsealed surface is to be bituminised • Sealed surface to blend in with existing paved areas • Additional car parking spaces to be provided • Surface drainage into existing arrangements • Draft plan below  <ul style="list-style-type: none"> • Site Location below  <p>A business case and a capital expenditure proposal will be submitted to obtain capital funding by the 24/09/2019.</p>

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
9	Fugitive Dust – Sealing exposed unsealed surfaces	Seal area – north of reclaimer shed	31	By 24/09/2019, ABC will obtain capital expenditure for sealing 1200m ² of unsealed surfaces on the northern side of the reclaimer shed with bitumen	<p>ABC has obtained capital expenditure approval to seal 1200m² of unsealed surfaces on the northern side of the reclaimer shed with bitumen.</p> <p>Implementation of this project has now commenced to enable the area to be sealed by 26/11/2019.</p>
9	Fugitive Dust – Sealing exposed unsealed surfaces	Seal area – north of reclaimer shed	32	<p>Subject to capital approval by the 24/09/2019, ABC will seal 1200 m² of unsealed surface area on the northern side of the limestone reclaimer by 26/11/2019.</p> <p>Project completed</p>	<p>ABC has sealed 1200m² of unsealed surfaces on the northern side of the reclaimer shed with bitumen.</p> <p>The bituminised area is now being utilised to provide additional car parking spaces – see photograph below.</p>  <p>Independent air quality modelling and analysis indicates this project may reduce the maximum 24 h-hr average concentrations of PM₁₀ at the Community Park by 0.3 µg/m³.</p> <p>The EIP project was completed on the 23/10/2019 before the required compliance date of 26/11/2019.</p>

**Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Programme (EIP)
1 March 2019 – December 2022**

EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
14	Noise	CM1/CM7 Clinker Gantry Dust Collector Fans	46	By 18/7/2019, ABC will complete an engineering study to enable approval of capital expenditure to reduce noise emissions from CM1/CM7 Clinker Gantry Dust Collection Fans	<p>ABC has developed an engineering scope of work and obtained estimated project costs.</p> <p>In summary:</p> <ul style="list-style-type: none"> • ABC will install duct noise attenuators on the CM1/CM7 Clinker Gantry Dust Collection Fans <p>An expenditure proposal will be submitted to obtain funding for implementation by the 17/10/2019.</p>
14	Noise	CM1/CM7 Clinker Gantry Dust Collector Fans	47	By 17/10/2019, ABC will commit to a noise attenuation option and obtain approval for the necessary expenditure.	<p>ABC has obtained capital funding to install duct noise attenuators on the CM1/CM7 Clinker Gantry Dust Collection Fans.</p> <p>Subject to the annual plant shutdown commencing on 6/01/2020, ABC will implement the CM1/CM7 Clinker Gantry Dust Collection Fans by the 31/01/2020.</p>

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
14	Noise	CM1/CM7 Clinker Gantry Dust Collector Fans	48	<p>Subject to capital approval by 17/10/2019 and annual plant shutdown commencing on 6/01/2020, ABC will implement the CM1/CM7 Clinker Gantry Dust Collection Fans by the 31/01/2020.</p> <p>Project completed</p>	<p>ABC has installed splitter silencers, designed by the dust collector fan supplier, on the CM1/CM7 Clinker Gantry Dust Collection Fans.</p>  <ul style="list-style-type: none"> • Measured noise levels from the dust collectors fitted with the new designed splitter silencer at 59-61 dBA • The new silencers have achieved a significant noise reduction of 10-12 dBA at source when compared with Vipac Engineers baseline measurements of 71dBA. <p>ABC will engage an acoustic engineer in accordance with EIP compliance action 51 to assess and validate the reductions achieved.</p>

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15	Noise	BH Gas Train noise abatement (APA Project)	49	<p>By the 27/02/2020, ABC will work with APA Group (owners of the Gas Train and equipment) to assess and implement further noise abatement options. APA is solely responsible for the selection and implementation of noise attenuation measures.</p> <p align="center">Project completed</p>	<ul style="list-style-type: none"> • ABC has worked with APA to further reduce noise levels from the Gas Train • APA installed axial flow regulators, flow meter, associated pipework on duty leg of gas train - completed 19/02/2020 • A significant reduction of 10 - 12 dBA with the new equipment is indicated • ABC will engage an acoustic engineer in accordance with EIP action 51 to validate noise reduction <div style="text-align: center;">  <p>Before Modifications</p>  <p>After Modifications</p> </div>

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EIP Project	Category	Project	Compliance Action	Project Milestones (Compliance actions)	Actions & Outcomes
16	Noise	Kiln Feed Elevator Gear box	50	<p>By the 26/4/2019, ABC will have replaced the noisy gearbox on the kiln feed elevator and reinstate its Western cladding.</p> <p align="center">Project completed</p>	<p>Kiln feed elevator gear box has been replaced and Western cladding has been reinstated.</p> <ul style="list-style-type: none"> • Photo showing gearbox installed  <ul style="list-style-type: none"> • Vipac (Acoustic Consultants) measured noise levels on 16/4/2019 from the replaced gearbox at 91dBA, at 1m distance from the gearbox. • A reduction of 9dBA has been achieved (previously 100dBA in November 2018) • Photo showing replacement of western cladding (dark blue section) 