

MinterEllison

14 July 2020

BY EMAIL ONLY

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Dear Danielle

Boral Cement Limited application for authorisation AA1000517—interested party consultation & request for further information.

1. We act for Stanwell Corporation Limited (**Stanwell**) in relation to this matter.
2. We refer to the letter from the ACCC dated 19 June 2020, in which the ACCC requested Stanwell provide information to assist the ACCC with its assessment of Boral Cement Limited's application for authorisation.
3. The purpose of this letter is to provide a response to this request, which is set out in the **Annexure** to this letter.
4. The Annexure to the letter contains certain information which is confidential to Stanwell and other parties referred to in the Annexure. This confidential information has been highlighted in the Annexure in red highlighting. Stanwell requests that the ACCC treat the highlighted information as strictly confidential (subject to its usual confidentiality provisos) and that it be redacted from this document prior to publication on the ACCC's public register.
5. Confidential Attachments 1 – 4 are also confidential to Stanwell and/or other parties. Stanwell requests that these Confidential Attachments are treated as strictly confidential and are not placed on the ACCC's public register.

Please let us know if the ACCC has any questions.

Yours faithfully

MinterEllison

Contact: Elizabeth Emmett T: [REDACTED]

Partner: Kathryn Finlayson T: [REDACTED]

OUR REF: 1274462

Annexure – Response to Information Request

1. **What is Stanwell's commercial rationale or business plan in relation to the fly ash which is produced from the Tarong PS? Please explain in detail why fly ash from Tarong PS is not currently available in the market. Please provide documents which support the information provided in response to this question.**
 - 1.1 Stanwell's core business is the production of electricity. Coal combustion products (**CCPs**), including fly ash, are by-products of the process of coal combustion to generate electricity, and must be managed by Stanwell in accordance with the relevant regulatory requirements. Stanwell currently manages fly ash produced at the Tarong Power Station (**Tarong PS**) by depositing it in mine voids at the adjacent Meandu Mine and in the Tarong Ash Dam, along with other CCPs.
 - 1.2 Stanwell and its predecessor in law, Tarong Energy Corporation, have sold CCPs produced from Tarong PS almost continuously since the 1980s, from Tarong North Power Station (**Tarong North PS**) since the early 2000s, and from Stanwell Power Station (**Stanwell PS**) since the late 2000s. Previous arrangements have been the subject of authorisation applications or notifications to the ACCC. Most recently, in 2010, proposed arrangements with Cement Australia Pty Ltd for the sale of fly ash from Tarong PS and Tarong North PS were the subject of an application to the ACCC for authorisation and, in 2015, proposed arrangements with Coal Reuse Pty Limited (**Coal Reuse**) in respect of CCPs from Tarong PS, Tarong North PS, Stanwell PS and the Meandu Mine were the subject of notification to the ACCC.
 - 1.3 Stanwell's commercial rationale and strategic intent for the sale of fly ash produced at each of Stanwell's power stations to third party offtakers has consistently been to:
 - (a) maximise the volume of fly ash moved to productive use (that is, beneficially reused in accordance with the relevant regulatory requirements), while providing revenue to Stanwell; and
 - (b) reduce Stanwell's costs in relation to fly ash management and storage requirements on site.
 - 1.4 Stanwell's current strategy for the offtake of fly ash from Tarong PS remains consistent with the above rationale. It is informed by Stanwell's historical experience with the sale of CCPs and involves:
 - (a) Stanwell entering into an arrangement with an appropriately qualified counterparty who can design, construct, operate, manage and maintain a fly ash offtake facility at the Tarong PS.
 - (b) Stanwell owning the to-be-constructed fly ash offtake facility, with Stanwell funding the cost of construction and approving the design of that facility.
 - (c) The arrangement providing Stanwell with a return on its investment in the fly ash offtake facility via the future sales of fly ash from that facility.
 - (d) Maximising offtake, by the counterparty taking CCPs for its own demand requirements and supplying to third parties. In particular, Stanwell requires that the arrangement enable competitive access to Tarong PS fly ash (which could be cement grade or other fly ash products) by other third-party buyers of fly ash.
 - (e) Stanwell's strategy involves using a take or pay arrangement, primarily to address Stanwell's need for a reliable return on its investment and to reduce offtake risk. Stanwell also considers that a take or pay arrangement will incentivise its counterparty to facilitate other third-party access to fly ash to the extent the take or pay requirement is higher than the counterparty's own usage requirements.
 - (f) The counterparty having the ability to comply with Stanwell's policies, licences and regulations.
 - 1.5 While Stanwell will be the owner of the offtake facility, Stanwell does not regard the operation and maintenance of the facility to be part of its core business and Stanwell's preference is therefore to identify a counterparty with the capacity to design, construct, operate and manage the offtake

facility. That is particularly the case because Stanwell has no interest in expanding its business to encompass the management and operation of a fly ash offtake facility. Stanwell considers that a counterparty who is experienced in the construction and use of such equipment, who is involved in the design and construction of the facility, and who also takes fly ash via the facility for its own use and is contractually required and incentivised to maximise offtake to third parties, will have a natural interest in the operation and maintenance of the facility and is best placed to manage the operating and market risks of such an offtake facility.

- 1.6 Fly ash from the Tarong PS is not currently available to third party offtakers, because there is no infrastructure in place to offtake fly ash.
- 1.7 Stanwell does not currently have a document which sets out its 'business plan' in relation to the sale of fly ash from Tarong PS. Stanwell is developing an overarching CCP Management Plan, which is intended to incorporate all aspects of CCP management, sales and compliance across Stanwell. Stanwell now also has a CCP Management Team (comprising two dedicated part-time roles) to assist with its CCP strategy. The CCP Management team includes the recently appointed Coal Combustion Products Marketing Specialist, who is primarily responsible for both the contract management and marketing/promotion of Stanwell's CCPs across Stanwell's sites. The role will support the identification, validation and progression of strategically aligned commercial opportunities and projects relating to the increased utilisation of CCPs.
- 1.8 To support Stanwell's response above, provided with this response is a Memorandum to the Chief Executive Officer from the Chief Financial Officer and Chief Operations Officer dated 17 April 2018 at **Confidential Attachment 1**, and a Memorandum for Executive Leadership Team endorsement dated 3 December 2018 at **Confidential Attachment 2**.

2. In relation to the tender process that resulted in the Design and Construct Contract (DCC) and Offtake Operation and Maintenance Agreement (OOMA) with Boral Cement, please advise:

(a) Why did Stanwell run the tender for the management of fly ash at Tarong PS?

- 2.1 Until late 2014, there was a fly ash offtake facility at Tarong PS which was owned and operated by Pozzolanic Enterprises Pty Ltd, part of the Cement Australia group. Since the removal of this facility in late 2014, 2,885t of fly ash has been taken from the Tarong PS, with all other fly ash produced at the Tarong PS being deposited in voids at the Meandu Mine or the Tarong Ash Dam.
- 2.2 The removal of the Cement Australia owned facility followed the conclusion of Stanwell's 2013 expression of interest (**EOI**) process for the removal and/or utilisation of CCPs from the Tarong PS, Tarong North PS and the Stanwell PS in which Coal Reuse was selected as the preferred participant. Coal Reuse subsequently entered into a contract with Stanwell for the offtake of CCPs, but in September 2016 was placed in liquidation and its contract with Stanwell was terminated. Under its contract with Stanwell, Coal Reuse removed 2,885t of fly ash from Tarong PS using an augur. Stanwell did not consider the augur to be an acceptable long term means by which to make fly ash available for offtake and the augur was removed from site after the contract with Coal Reuse came to an end.
- 2.3 In late 2016, Stanwell conducted a further EOI process, inviting responses from contracting firms with sound financial and technical backgrounds interested in proposing methods for the management, removal and / or utilisation of CCPs from Stanwell's coal-fired generation sites located at Tarong PS, Tarong North PS, Stanwell PS and the Meandu Mine. This EOI process identified current market demand of 84,000 tonnes per annum for fly ash from Zones 2 and 3 of the Tarong PS precipitators, on the premise that Stanwell would investigate the reinstatement of a Tarong PS cement grade fly ash offtake facility. The market demand identified at that time was insufficient to support a business case for Stanwell making that investment.
- 2.4 In the absence of a compelling business case to underpin a Tarong PS fly ash offtake facility (due to uncertainty around market demand), in 2017 Stanwell engaged a third-party consultant, Bilmar Solutions Pty Ltd (**Bilmar**) to further assess that risk. Bilmar was engaged to provide market knowledge and understanding of potential interest in fly ash produced at the Tarong PS. The report produced by Bilmar was used to inform Stanwell's current strategy in relation to the offtake of fly ash produced at the Tarong PS, and the decision to conduct the subsequent expression of interest process in 2018 (**2018 EOI process**). That report is included at **Confidential Attachment 3** to this response.

2.5 Stanwell conducted the 2018 EOI process to identify companies with demonstrated financial and technical capacity interested in the offtake of fly ash at the Tarong PS and the Tarong North PS (together, the **Tarong Power Station Precinct**). Stanwell used the 2018 EOI process to identify a short list of appropriate potential counterparties with whom Stanwell could then conduct negotiations, with a view to identifying a preferred participant in furtherance of its strategy as outlined in response to Question 1 above. Through the 2018 EOI process, Stanwell hoped to identify:

- (a) market interest in partnering with Stanwell for the offtake of fly ash from Tarong PS and the engineering, procurement, construction and management of an offtake facility;
 - (b) available and emerging technologies for the processing and removal of fly ash;
 - (c) current market interest in, and demand for, the various grades of fly ash available from the Tarong Power Station Precinct; and
 - (d) offtakers with the ability to maximise and increase the overall fly ash offtake from the Tarong Power Station Precinct.
- (b) Why does Stanwell want a separate entity to construct and operate the fly ash facility?**

2.6 As set out above, Stanwell's core business is the production of electricity. While Stanwell will own the fly ash offtake facility to be constructed at the Tarong PS, and will fund the construction and approve the design, Stanwell does not have any interest in expanding its business to encompass the construction, maintenance and operation of a fly ash offtake facility at the Tarong PS. On that basis, Stanwell has developed the current strategy as set out in response to Question 1 above.

- (c) What is Stanwell's commercial rationale for entering into the OOMA and DCC with Boral Cement?**

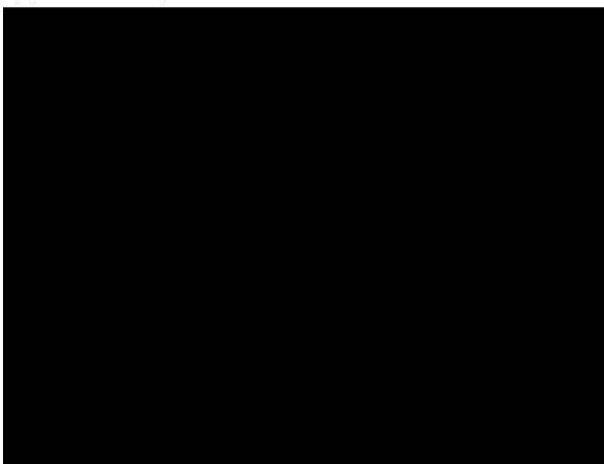
2.7 Stanwell entered into the DCC and the OOMA with Boral Cement Limited (**Boral**) because Boral was the preferred participant following the 2018 EOI process as detailed in response to Questions 2(a) and 2(e). The DCC and the OOMA represent a negotiated position between Stanwell and Boral, with terms that are directed to the implementation of Stanwell's strategy as outlined in response to Question 1 above and are commercially acceptable to both parties.

- (d) Who responded to the tender? Did Stanwell receive a tender from any other party that was likely to be acceptable / meet its desired commercial and operational objectives?**

2.8 Stanwell's EOI was advertised openly via the QTenders system, and Stanwell received responses from the following respondents:



- (b) Boral;



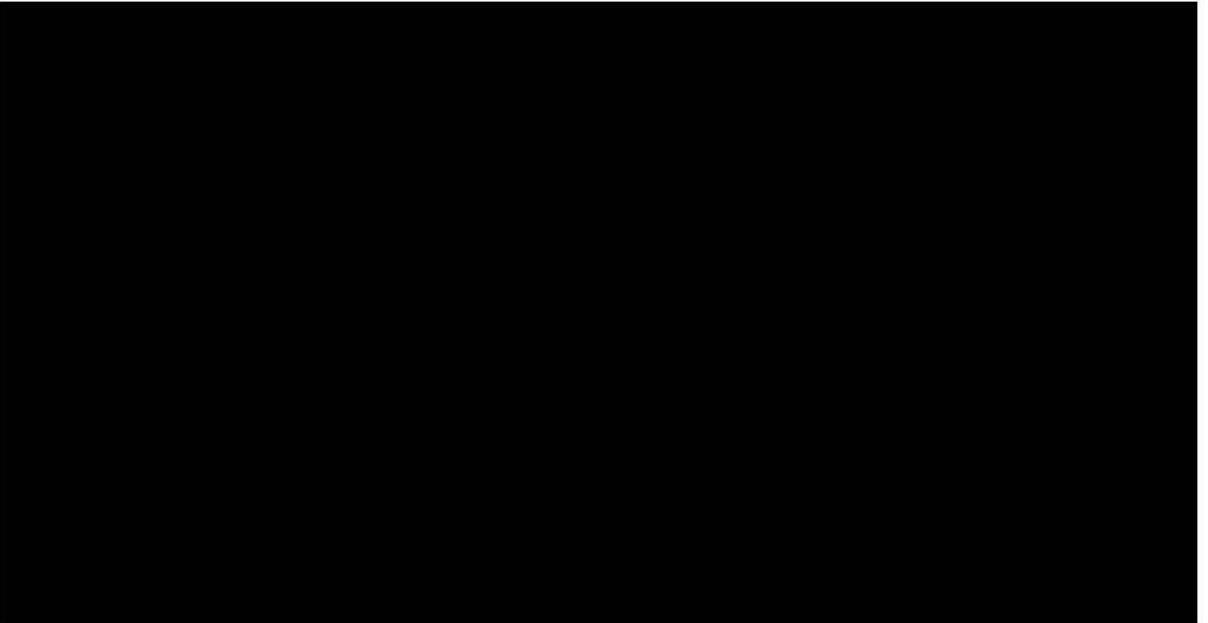
2.9 Following Stanwell's assessment of the responses as outlined in response to Question 2(e) below, the shortlisted participants were invited to respond to a term sheet prepared by Stanwell,

which reflected the strategy outlined in response to Question 1 above. The term sheet responses were further assessed by Stanwell, and the term sheets of Boral [REDACTED] were assessed as acceptable as they met Stanwell's requirements. Further detail is provided in response to Question 2(e) below.

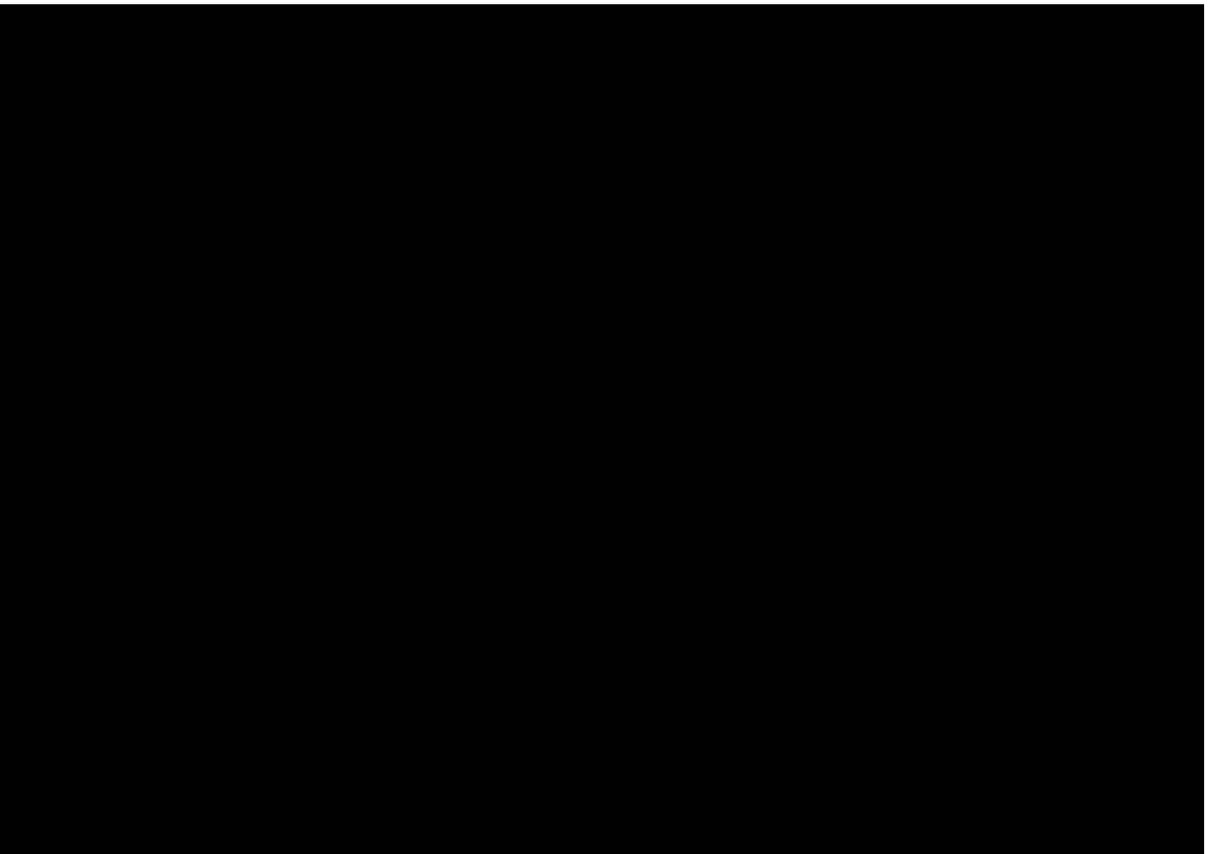
(e) Please provide details of tender responses and assessment(s) of tender responses by Stanwell.

2.10 A copy of the EOI responses is contained at **Confidential Attachment 4**. Stanwell conducted an initial review of all EOI responses and identified that [REDACTED] participants' responses contained sufficient details to proceed to a full evaluation: Boral, [REDACTED]

2.11 The remaining [REDACTED] responses did not proceed past this initial review for the following reasons:



2.12 A summary of key aspects of Stanwell's evaluation of the other [REDACTED] EOI responses are as follows:



- [REDACTED]
- 2.13 Following its evaluation, Stanwell shortlisted Boral, [REDACTED]. [REDACTED] was not shortlisted after clarification that their EOI was based on [REDACTED] retaining ownership of the fly ash offtake facility, which did not conform with Stanwell's strategy.
- 2.14 The [REDACTED] shortlisted participants were then issued a term sheet and were invited to individual site visits at the Tarong PS to inform their term sheet responses. The focus of the term sheet was to finalise construction cost, offtake volume and price, and to establish other key design, construction and operation parameters and offtake terms. After the initial term sheets were received, there were two rounds of term sheet clarifications, including face to face meetings.
- 2.15 After the final term sheets were received, Stanwell conducted an evaluation of the final term sheets, which is summarised as follows:

3. Recognising that fly ash is a by-product from the operation of Tarong PS to generate electricity, what is the production profile of fly ash at Tarong PS? Is fly ash consistently available on a daily basis? Does the quantity, kind, standard or quality of fly ash produced vary on a daily, weekly or other periodic basis? If so, provide details of the underlying factors for such variance. Does the construction of the new fly ash facility under the DCC impact the production profile of fly ash at Tarong PS?

Volume or quantity of fly ash produced – Is fly ash consistently available on a daily basis? Does the quantity of fly ash produced vary on a daily, weekly or other periodic basis?

- 3.1 Fly ash is produced at Tarong PS on a daily basis. The volume of fly ash that is produced on any particular day depends on the operation of the 4 units at Tarong PS.
- 3.2 Two factors that can affect fly ash production volumes are:
- (a) Unit load. Unit load depends on electricity demand. For example, less coal is required to meet the lower loads when there is lower demand, and, as a result, less fly ash is produced. For many years, Tarong PS was consistently operated at full base load capacity, and therefore consistently produced high volumes of fly ash. More recently, Tarong PS has had a variable generation profile, which has a consequential impact on the ash volumes produced and the consistency of ash production. Future ash production will depend on electricity demand in an ever-evolving market, which includes the large scale introduction of renewable electricity generation. In addition to longer term demand

impacts, unit load also varies throughout the day and night, and throughout the year, with demand typically higher in the evenings and during the summer months.

- (b) unit outages (either planned or unplanned), which will reduce fly ash production during the period of the outage when the unit is offline.

3.3 Fly ash production figures are generally annualised to take account of those fluctuations.

Profile, quality, kind or standard of fly ash – What is the production profile of fly ash at Tarong PS? Does the kind, standard or quality of fly ash produced vary on a daily, weekly or other periodic basis?

3.4 The profile, kind, standard and quality of ash produced at the Tarong PS has not historically varied in any appreciable way. **Attachment 5** is an excel spreadsheet in which Stanwell has collated historical testing results of fly ash produced at the Tarong PS together with current Safety Data Sheets from the most recent sample testing. Testing is undertaken in accordance with, and to demonstrate compliance with, the relevant parameters identified in the End of Waste Code (End of Waste Code – Coal Combustion Products ENEW07359717) (and previously the Beneficial Use Approval) which regulates the beneficial reuse of fly ash in bound and unbound products in Queensland.

3.5 The Tarong PS infrastructure itself creates different classifications of fly ash due to the way that fly ash produced by the coal combustion process is captured in the four electrostatic precipitators of each of the six zones. In particular:

- (a) The fly ash from Zones 2, 3, 4, 5 and 6 typically meet the relevant cement standard without classifying.
- (b) The fly ash from Zone 1 can also meet the cement standard but must be classified to remove oversized particles (approximately 50% of the volume of fly ash produced in Zone 1 meets the cement standard). Classified Zone 1 fly ash can therefore be used to supplement the volumes of cement standard fly ash from Zones 2 and 3. The low quantity of fly ash that is captured in Zones 4, 5 and 6 reduces the financial viability of extracting fly ash from those zones.

3.6 Other factors which may affect the quality of fly ash produced by the coal combustion process include:

- (a) poor combustion performance, which can increase the carbon in ash percentage in the fly ash;
- (b) changes in the fuel profile (for example the use of different quality coals or alternative fuel).

Does the construction of the new fly ash facility under the DCC impact the production profile of fly ash at Tarong PS?

3.7 The construction of the fly ash offtake facility will not impact profile, quality, kind or standard or volume of fly ash produced at the Tarong PS. When complete, the infrastructure will permit removal of the fly ash from Zones 1 to 3 of the Tarong PS precipitators and convey the fly ash to a loadout facility, from which point the fly ash can be loaded into tankers and taken offsite.

3.8 The fly ash offtake facility to be constructed will have a capacity to offtake ██████████ product tonnes per annum, and will be capable of recovering, processing and dispatching the fly ash produced in Zones 1 to 3. The infrastructure will include a classifier and two product storage silos.

3.9 The classifier will increase the volume of cement standard compliant ash by removing oversized product from Zone 1 fly ash (rejects from classification will report to Stanwell's ash management system). The silos will provide a buffer against the risk of reduced production (for example, due to outages or variations in load as set out above).

4. In the absence of the arrangements between Stanwell and Boral Cement, how would fly ash from Tarong PS be managed? If it was to be sold, to who, under what type of arrangement, and within what timeframe? Please provide documents which support the information provided by Stanwell in response to this question.

- 4.1 The grant of authorisation is currently a condition precedent to the commencement of the OOMA between Stanwell and Boral. Stanwell has not considered whether it would waive the condition precedent in the event that authorisation is not granted.
- 4.2 The DCC is not subject to the grant of authorisation and construction of the facility under the DCC has commenced. Stanwell is paying for the construction and will own the facility when constructed, regardless of the OOMA.
- 4.3 In the absence of an arrangement with Boral, Stanwell would likely continue to seek to maximise the sale of fly ash produced at the Tarong PS in accordance with its long-term rationale and the strategy set out in response to Question 1 above. On the basis that the offtake facility is constructed, this may involve re-engaging with the market to identify an appropriate counterparty to operate and maintain the offtake facility on terms which provide Stanwell a return on its investment.
- 4.4 In the absence of commercially acceptable arrangements to sell fly ash produced at the Tarong PS, Stanwell would continue to manage the unsold fly ash by depositing it in the mine voids at the adjacent Meandu Mine and in the Tarong Ash Dam, along with other CCPs.

5. What is the likely future cost of disposal if Stanwell were to continue to transport fly ash to the Meandu Mine void? Is it possible that Stanwell will be required to incur some of this expense if Boral Cement were to elect not to take the minimum quantities of fly ash (notwithstanding that Boral Cement would still be required to pay the contractual amount)? What expense does Stanwell expect to incur in managing fly ash that is not taken by Boral Cement during the term of the OOMA?

- 5.1 Notwithstanding the arrangement with Boral, Stanwell will need to continue managing fly ash via its ash management system, and depositing fly ash in the Meandu Mine voids and the Tarong Ash Dam throughout the term of the OOMA, because the quantity of ash produced at the Tarong PS will exceed the amount removed offsite by Boral. The ash management system is also used for the management of any fly ash from Tarong North PS that is not sold to offtakers and removed from site.
- 5.2 Stanwell has not comprehensively costed its current or future costs of storing fly ash and other CCPs in the Meandu Mine voids, including the part of its ash management system which conveys fly ash to the Ash Thickening Plant where it is treated before being conveyed to and deposited in voids at the Meandu Mine.
- 5.3 Stanwell has only costed the current direct cost to the Tarong PS and the Tarong North PS (the costs are shared between the Tarong PS and Tarong North PS) of the conveyance of ash from the Ash Thickening Plant to the Meandu Mine. Stanwell estimates that this costs approximately [REDACTED] which includes ongoing maintenance and some operational costs of the Ash Thickening Plant.
- 5.4 Other costs which have been incurred by Stanwell, or which may be incurred by Stanwell in the future, include the original capital costs, the cost of overhauls of the Ash Thickening Plant, the costs of conveying fly ash to the Tarong Ash Dam if the Ash Thickening Plant is offline, the costs incurred by the Meandu Mine site which are associated with the ash storage, and ongoing compliance costs (for example, for annual engineering inspections which must be done at both the Tarong Ash Dam and the Meandu Mine).
- 5.5 Any accurate estimate of future costs would also need to consider the potential savings in operational costs if any significant offtake of ash from the to be constructed offtake facility is achieved.

Capacity of storage locations

- 5.6 The Tarong Ash Dam is a secondary ash storage, used when ash cannot be deposited to voids at the Meandu Mine (for example, when the Ash Thickening Plant is offline). Stanwell estimates that the Tarong Ash Dam has capacity to continue to receive ash at current rates for [REDACTED]. Stanwell is therefore considering options to improve its capacity, including dredging and removing ash to another facility. Stanwell will incur additional costs depending on the preferred option. Maximising ash offtake will delay the need for Stanwell to expend capital to increase the storage capacity of the Tarong Ash Dam.

- 5.7 Lack of capacity is not an issue for the voids at Meandu Mine. The current void in which ash is stored is the King 2 West-North void. It has an estimated further [REDACTED] capacity for ash storage and is expected to reach capacity (at current ash deposition rates) in approximately [REDACTED] at which point in time other voids become available for ash storage.
6. **For each power station owned by Stanwell (Tarong PS, Tarong North PS and Stanwell PS) please provide the ACCC with data and/or estimates of the following:**
- (a) **How much fly ash is produced per year?**
 - (b) **What kind, standard or quality is this fly ash?**
 - (c) **What quantity of fly ash is sold, and to whom?**
 - (d) **Where fly ash is not sold, how is it managed by Stanwell? What are the barriers to selling fly ash for use in downstream markets?**

Tarong PS

- 6.1 The long-term average annual volume of fly ash produced at the Tarong PS is [REDACTED]¹
- 6.2 Tarong PS has electrostatic precipitators which remove fly ash from the flue gases before the gas is released into the atmosphere. The gas 'flows' across the 6 zones of each of the 4 units, with the heaviest material collecting into Zone 1 and the lightest material falling into Zone 6. Each of the 6 zones of the 4 units contains metal plates which hold an electric charge. The plates attract fly ash which is held on the plate, with the plates in each zone being periodically rapped with a mechanical hammer which causes the fly ash to fall into the precipitator hopper which sits underneath.
- 6.3 Under the OOMA, Boral will have the right to remove fly ash from the precipitator hoppers of all 4 units at the Tarong PS. However, any fly ash not taken by Boral will remain the property of Stanwell.
- 6.4 The kind, standard or quality of the fly ash produced at the Tarong PS is set out in response to Question 3 above. The historical testing results of the fly ash together with current Safety Data Sheets are included at **Attachment 5**.
- 6.5 Stanwell does not currently sell fly ash produced at the Tarong PS. However, Stanwell currently sells other CCPs produced at Tarong PS, particularly cenospheres and Ash Thickening Plant rejects.
- 6.6 As set out above, Stanwell manages the fly ash produced at the Tarong PS by depositing it in the mine voids at the adjacent Meandu Mine and in the Tarong Ash Dam.
- 6.7 Stanwell considers that the current critical barrier to selling fly ash from Tarong PS for use in downstream markets is the absence of offtake infrastructure at Tarong PS.

Tarong North PS

- 6.8 The long-term average annual volume of fly ash produced at the Tarong North PS is [REDACTED]²
- 6.9 The OOMA entered into with Boral does not include offtake of fly ash from the Tarong North PS. Stanwell remains willing to engage with parties directly in relation to the offtake of fly ash from the Tarong North PS.
- 6.10 The kind/quality of fly ash produced at the Tarong North PS is a 'run of station' ash, being ash which is not classified prior to offtake. Unlike Tarong PS, which uses electrostatic precipitators, Tarong North PS uses a bag filter system to remove ash from flue gas. The gas is filtered by bag

¹ This figure has been calculated using data from the last 9 financial years, 2011/12 to 2019/20. Stanwell and its predecessor in respect of Tarong PS, Tarong Energy Corporation, have previously provided estimates of the fly ash produced at the Tarong PS and Tarong North PS. There may be some variation in the estimates given the operation of the power stations and variations in the basis of calculation.

² This figure has been calculated using data from the last 9 financial years, 2011/12 to 2019/20. Stanwell and its predecessor in respect of Tarong PS, Tarong Energy Corporation, have previously provided estimates of the fly ash produced at the Tarong PS and Tarong North PS. There may be some variation in the estimates given the operation of the power stations and variations in the basis of calculation.

filters which then shake the ash into hoppers which sit underneath. The fly ash is collectively conveyed to a silo where it is available for offtake. There is therefore no design-based sorting or classifying of the fly ash at Tarong North PS and the 'run of station' ash produced at Tarong North PS requires classifying or processing to meet the cement standard.

- 6.11 This 'run of station' fly ash is available for offtake through existing Stanwell infrastructure at the Tarong North PS. In 2019, Stanwell sold the following quantities of run of station ash:




- 6.12 Any fly ash produced at Tarong North PS which is not sold is managed via the same ash management system as fly ash from Tarong PS, and is deposited in the mine voids at the adjacent Meandu Mine and in the Tarong Ash Dam.

- 6.13 Stanwell considers that two barriers to selling fly ash from Tarong North PS for use in downstream markets are:

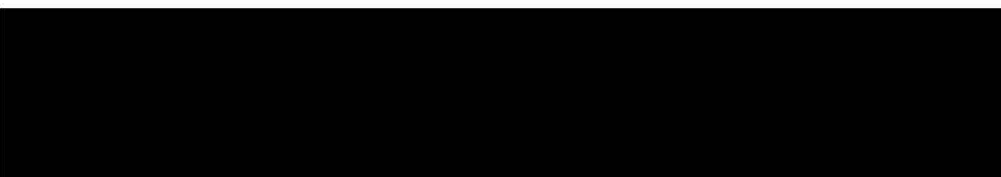
- (a) the limited load out facility available at the Tarong North PS. Additional infrastructure would be required to increase offtake, and, if cement grade fly ash was to be available directly from Tarong North PS, classifying or processing equipment would also be required to remove oversized material from the run of station fly ash;
- (b) reliability of supply from a single unit power station. For example, the availability and supply of ash in 2020 has been impacted by an unplanned Tarong North PS outage of 121 days.

Stanwell PS

- 6.14 The long-term average annual volume of ash produced at the Stanwell PS is ³

- 6.15 The kind/quality of fly ash produced at the Stanwell PS is a 'run of station' ash in that, like Tarong North PS, the fly ash is not classified prior to offtake. Like Tarong PS, Stanwell PS uses electrostatic precipitators for each of its 4 units to remove fly ash from the flue gas, but the fly ash from the precipitator hoppers is collectively fed to 4 silos, from which ash can be taken for offtake. The silos are paired so that the Unit 1 and 2 silos feed one offtake point, and the Unit 3 and 4 silos feed another. At present, the 'run of station' ash produced at Stanwell PS during periods of high load can meet the cement grade standard without classifying or further processing.

- 6.16 This 'run of station' ash is available for offtake through existing Stanwell infrastructure at the Stanwell PS. In 2019, Stanwell sold the following quantities of run of station ash:



- 6.17 Any run of station / fly ash produced at Stanwell PS that is not sold and taken offsite is mixed with bottom ash and deposited as a dense phase slurry into the Stanwell Ash Storage Area.

- 6.18 The load out facility at Stanwell PS is sufficient for the current demand, however Stanwell considers the load out facility to be a barrier to increasing the amount of fly ash sold for use in downstream markets. Additional infrastructure would be required to increase offtake. The location of Stanwell PS and the costs of transporting fly ash from Stanwell PS may also be a barrier, depending on where the fly ash is to be transported and the means of transportation.

³ This figure has been calculated using data from the last 9 years, 2011 to 2019.

7. Please explain in detail any geographical challenges or realities in relation to the distribution of fly ash in Queensland and other east coast locations. For example, does the location of a prospective purchaser of fly ash in Queensland and other east coast locations limit the suppliers from whom they can acquire fly ash? Are there practical or economic limits on how far outside Queensland fly ash that is produced in Queensland can be delivered?

7.1 Stanwell's knowledge of the geographical challenges or realities in relation to the distribution of fly ash is anecdotal as acquired by Stanwell personnel over time and as informed by others (the report produced by Bilmar (at **Confidential Attachment 3** is an example of Stanwell seeking information and being informed by others).

7.2 Stanwell consequently understands that geographic proximity to end use is considered by cement industry participants when sourcing cement grade fly ash such that proximity reduces transport costs (as indicated in the response to Question 6 about barriers to the sale of fly ash from Stanwell PS). However, Stanwell also understands that fly ash produced in Queensland is used and sold interstate, and is aware that Cement Australia has shipped fly ash to the southern states.

8. Which current suppliers of concrete use fly ash in production? From whom do these concrete suppliers acquire fly ash, and how much fly ash do they acquire per year. Please outline any difficulties which may exist in acquiring concrete grade fly ash.

8.1 In 2019, Stanwell supplied Tarong North PS fly ash to [redacted] and Stanwell PS fly ash to [redacted]

8.2 The quantity of fly ash supplied to those companies in 2019 was:

Supplier	Volume of fly ash acquired from Stanwell	Source
[redacted]	[redacted]	Tarong North PS
[redacted]	[redacted]	Tarong North PS
[redacted]	[redacted]	Stanwell PS
[redacted]	[redacted]	Stanwell PS

8.3 Stanwell is aware from the 2018 EOI process that the following companies acquire fly ash for use in the production of cement:

(a) Boral;

[redacted]

9. Submissions on the public benefits and effect on competition of the proposed arrangements, or any other issue which you consider is relevant for the ACCC's assessment of this matter.

9.1 Stanwell generally supports the submissions made by Boral.

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name FLY ASH (TARONG POWER STATION)
Synonym(s) COAL FIRED FLY ASH • COAL FLY ASH • PULVERISED FUEL ASH

1.2 Uses and uses advised against

Use(s) ADDITIVE • CEMENT ADDITIVE • LANDFILL • ROAD MAKING • SOIL STABILISER • SUPPLEMENTARY CEMENTITIOUS MATERIAL (SCM)

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

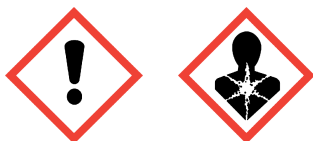
CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 1

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H372 Causes damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME FLY ASH (TARONG POWER STATION)

Response statement(s)

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P321 Specific treatment is advised - see first aid instructions.
P362 Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	74%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	<25%
ALUMINIUM OXIDE	1344-28-1	215-691-6	22%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	FINE GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	4 (aqueous solution)
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--

Skin	Contact may result in irritation, redness, pain and rash.
Eye	Contact may result in irritation, lacrimation, pain and redness.
Sensitisation	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Insufficient data available to classify as a mutagen.
Carcinogenicity	Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from silicosis.
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – single	Over exposure may result in irritation of the nose and throat, with coughing.

PRODUCT NAME FLY ASH (TARONG POWER STATION)**exposure**

STOT - repeated exposure Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

PRODUCT NAME FLY ASH (TARONG POWER STATION)

	Carc.	Carcinogen
	T	Toxic
	Xi	Irritant
Risk phrases	R36/37/38	Irritating to eyes, respiratory system and skin.
	R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
	R49	May cause cancer by inhalation.
Safety phrases	S22	Do not breathe dust.
	S24/25	Avoid contact with skin and eyes.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information

ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME FLY ASH (TARONG POWER STATION)**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name CENOSPHERES (TARONG POWER STATION)
Synonym(s) ASH CENOSPHERES • MICROSPHERES • POZOSPHERES

1.2 Uses and uses advised against

Use(s) FILLER
 LIGHTWEIGHT INERT FILLER FOR A RANGE OF APPLICATIONS.

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 1

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H372 Causes damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME CENOSPHERES (TARONG POWER STATION)

Response statement(s)

P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment is advised - see first aid instructions.
P362	Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statement(s)

P501	Dispose of contents/container in accordance with relevant regulations.
------	--

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	59%
ALUMINIUM OXIDE	1344-28-1	215-691-6	39%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	22%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
First aid facilities	Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	FINE WHITE TO GREY SOLID
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--

Skin Contact may result in irritation, redness, pain and rash.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Insufficient data available to classify as a mutagen.

Carcinogenicity Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from silicosis.

Reproductive Insufficient data available to classify as a reproductive toxin.

STOT – single Over exposure may result in irritation of the nose and throat, with coughing.

PRODUCT NAME CENOSPHERES (TARONG POWER STATION)**exposure**

STOT - repeated exposure Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

PRODUCT NAME CENOSPHERES (TARONG POWER STATION)

	Carc.	Carcinogen
	T	Toxic
	Xi	Irritant
Risk phrases	R36/37/38	Irritating to eyes, respiratory system and skin.
	R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
	R49	May cause cancer by inhalation.
Safety phrases	S22	Do not breathe dust.
	S24/25	Avoid contact with skin and eyes.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information

ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME CENOSPHERES (TARONG POWER STATION)

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
	GHS	Globally Harmonized System
	GTEPG	Group Text Emergency Procedure Guide
	IARC	International Agency for Research on Cancer
	LC50	Lethal Concentration, 50% / Median Lethal Concentration
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	OEL	Occupational Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	STEL	Short-Term Exposure Limit
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	SWA	Safe Work Australia
	TLV	Threshold Limit Value
	TWA	Time Weighted Average

Report status This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name BOTTOM ASH (TARONG POWER STATION)
Synonym(s) COAL FIRED FLY ASH • COAL FLY ASH • PULVERISED FUEL ASH

1.2 Uses and uses advised against

Use(s) ADDITIVE • CEMENT ADDITIVE • LANDFILL • ROAD MAKING • SOIL STABILISER • SUPPLEMENTARY CEMENTITIOUS MATERIAL (SCM)

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

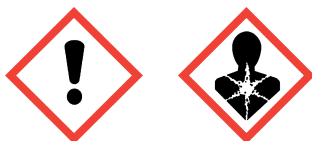
CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 1

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H372 Causes damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME BOTTOM ASH (TARONG POWER STATION)

Response statement(s)

P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment is advised - see first aid instructions.
P362	Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statement(s)

P501	Dispose of contents/container in accordance with relevant regulations.
------	--

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	75%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	<25%
ALUMINIUM OXIDE	1344-28-1	215-691-6	23%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
First aid facilities	Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

- Eye / Face** Wear dust-proof goggles.
- Hands** Wear PVC or rubber gloves.
- Body** Wear coveralls.
- Respiratory** Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT NAME BOTTOM ASH (TARONG POWER STATION)

9.1 Information on basic physical and chemical properties

Appearance	LIGHT TO DARK GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	7 (aqueous solution)
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--

Skin Contact may result in irritation, redness, pain and rash.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Insufficient data available to classify as a mutagen.

Carcinogenicity Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from silicosis.

Reproductive Insufficient data available to classify as a reproductive toxin.

STOT – single Over exposure may result in irritation of the nose and throat, with coughing.

PRODUCT NAME BOTTOM ASH (TARONG POWER STATION)**exposure**

STOT - repeated exposure Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

PRODUCT NAME BOTTOM ASH (TARONG POWER STATION)

Carc. Carcinogen
T Toxic
Xi Irritant

Risk phrases R36/37/38 Irritating to eyes, respiratory system and skin.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49 May cause cancer by inhalation.

Safety phrases S22 Do not breathe dust.
S24/25 Avoid contact with skin and eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME BOTTOM ASH (TARONG POWER STATION)**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Prepared by

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[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name RUN OF STATION ASH (TARONG NORTH POWER STATION)
Synonym(s) COAL FIRED FLY ASH • COAL FLY ASH • PULVERISED FUEL ASH

1.2 Uses and uses advised against

Use(s) ADDITIVE • CEMENT ADDITIVE • LANDFILL • ROAD MAKING • SOIL STABILISER • SUPPLEMENTARY CEMENTITIOUS MATERIAL (SCM)

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

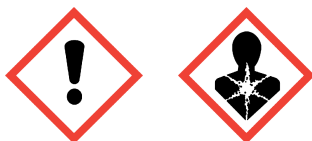
CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 1

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H372 Causes damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME RUN OF STATION ASH (TARONG NORTH POWER STATION)

Response statement(s)

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P321 Specific treatment is advised - see first aid instructions.
P362 Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	76%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	21%
ALUMINIUM OXIDE	1344-28-1	215-691-6	19%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	LIGHT TO DARK GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	5 (aqueous solution)
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--

Skin Contact may result in irritation, redness, pain and rash.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Insufficient data available to classify as a mutagen.

Carcinogenicity Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from silicosis.

Reproductive Insufficient data available to classify as a reproductive toxin.

STOT – single Over exposure may result in irritation of the nose and throat, with coughing.

PRODUCT NAME RUN OF STATION ASH (TARONG NORTH POWER STATION)**exposure**

STOT - repeated exposure Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

PRODUCT NAME RUN OF STATION ASH (TARONG NORTH POWER STATION)

Carc. Carcinogen
T Toxic
Xi Irritant

Risk phrases R36/37/38 Irritating to eyes, respiratory system and skin.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49 May cause cancer by inhalation.

Safety phrases S22 Do not breathe dust.
S24/25 Avoid contact with skin and eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME RUN OF STATION ASH (TARONG NORTH POWER STATION)

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
	GHS	Globally Harmonized System
	GTEPG	Group Text Emergency Procedure Guide
	IARC	International Agency for Research on Cancer
	LC50	Lethal Concentration, 50% / Median Lethal Concentration
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	OEL	Occupational Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	STEL	Short-Term Exposure Limit
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	SWA	Safe Work Australia
	TLV	Threshold Limit Value
	TWA	Time Weighted Average

Report status This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name FLY ASH (STANWELL POWER STATION)
Synonym(s) COAL FIRED FLY ASH • COAL FLY ASH • PULVERISED FUEL ASH

1.2 Uses and uses advised against

Use(s) ADDITIVE • CEMENT ADDITIVE • LANDFILL • ROAD MAKING • SOIL STABILISER • SUPPLEMENTARY CEMENTITIOUS MATERIAL (SCM)

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 2

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H373 May cause damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME FLY ASH (STANWELL POWER STATION)

Response statement(s)

P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment is advised - see first aid instructions.
P362	Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statement(s)

P501	Dispose of contents/container in accordance with relevant regulations.
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2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	54%
ALUMINIUM OXIDE	1344-28-1	215-691-6	21%
IRON OXIDE (FE2O3)	1309-37-1	215-168-2	13%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	2%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
First aid facilities	Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Iron oxide fume (Fe ₂ O ₃) (as Fe)	SWA (AUS)	--	5	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	LIGHT TO DARK GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	12 (aqueous solution)
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--
IRON OXIDE (FE2O3)	> 5000 mg/kg (rat)	--	> 210 mg/m ³ /2wks (rat)

Skin Contact may result in irritation, redness, pain and rash.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Insufficient data available to classify as a mutagen.

Carcinogenicity Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from

PRODUCT NAME FLY ASH (STANWELL POWER STATION)

	silicosis.
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – single exposure	Over exposure may result in irritation of the nose and throat, with coughing.
STOT - repeated exposure	Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION**NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA**

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

PRODUCT NAME FLY ASH (STANWELL POWER STATION)

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes	Carc. Xi Xn	Carcinogen Irritant Harmful
Risk phrases	R36/37/38 R48/20 R49	Irritating to eyes, respiratory system and skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation. May cause cancer by inhalation.
Safety phrases	S22 S24/25 S26	Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information	<p>ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).</p> <p>RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.</p> <p>PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.</p> <p>HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.</p>
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PRODUCT NAME FLY ASH (STANWELL POWER STATION)

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

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It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name BOTTOM ASH (STANWELL POWER STATION)
Synonym(s) COAL FIRED FLY ASH • COAL FLY ASH • PULVERISED FUEL ASH

1.2 Uses and uses advised against

Use(s) ADDITIVE • CEMENT ADDITIVE • LANDFILL • ROAD MAKING • SOIL STABILISER • SUPPLEMENTARY CEMENTITIOUS MATERIAL (SCM)

1.3 Details of the supplier of the product

Supplier name STANWELL CORPORATION LIMITED
Address GPO Box 800, Brisbane, QLD, 4000, AUSTRALIA
Telephone 1800 300 351
Email stanwellchemicals@stanwell.com
Website <http://www.stanwell.com>

1.4 Emergency telephone number(s)

Emergency 1800 300 351

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Skin Corrosion/Irritation: Category 2
 Serious Eye Damage / Eye Irritation: Category 2A
 Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
 Carcinogenicity: Category 1B
 Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 2

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H373 May cause damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME BOTTOM ASH (STANWELL POWER STATION)

Response statement(s)

P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment is advised - see first aid instructions.
P362	Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal statement(s)

P501	Dispose of contents/container in accordance with relevant regulations.
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2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SILICON DIOXIDE	7631-86-9	231-545-4	54%
ALUMINIUM OXIDE	1344-28-1	215-691-6	24%
IRON OXIDE (FE2O3)	1309-37-1	215-168-2	11%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	4%

Ingredient Notes The concentration of Quartz (Crystalline Silica) represents the respirable dust fraction of the product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
First aid facilities	Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Principal symptoms of silicosis are coughing and breathlessness. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Iron oxide fume (Fe ₂ O ₃) (as Fe)	SWA (AUS)	--	5	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Wet where possible. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	11 (aqueous solution)
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid) and alkalis (e.g. sodium hydroxide).

10.6 Hazardous decomposition products

Crystalline silica may form after the product is exposed to extended periods of high temperatures (> 900°C).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--
IRON OXIDE (FE2O3)	> 5000 mg/kg (rat)	--	> 210 mg/m ³ /2wks (rat)

Skin Contact may result in irritation, redness, pain and rash.

Eye Contact may result in irritation, lacrimation, pain and redness.

Sensitisation Not classified as causing skin or respiratory sensitisation.

Mutagenicity Insufficient data available to classify as a mutagen.

Carcinogenicity Crystalline silica is classified as carcinogenic to humans (IARC Group 1). However, there is a body of evidence supporting the fact that increased cancer risk would be limited to people already suffering from

PRODUCT NAME BOTTOM ASH (STANWELL POWER STATION)

	silicosis.
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – single exposure	Over exposure may result in irritation of the nose and throat, with coughing.
STOT - repeated exposure	Repeated exposure to respirable silica may result in pulmonary fibrosis (silicosis). Silicosis is a fibronodular lung disease caused by deposition in the lungs of fine respirable particles of crystalline silica. Principal symptoms of silicosis are coughing and breathlessness.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

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The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes	Carc.	Carcinogen
	Xi	Irritant
	Xn	Harmful
Risk phrases	R36/37/38	Irritating to eyes, respiratory system and skin.
	R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
	R49	May cause cancer by inhalation.
Safety phrases	S22	Do not breathe dust.
	S24/25	Avoid contact with skin and eyes.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information	<p>ALUMINO SILICATES: When alumino silicates have been exposed to service temperatures exceeding 982°C for prolonged periods, cristobalite, a form of crystalline silica may be formed. Exposure to cristobalite dust may cause pulmonary fibrosis-silicosis. A hazard is only anticipated during demolition of used refractory materials. Cristobalite is classified as carcinogenic to humans (IARC Group 1).</p> <p>RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.</p> <p>PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.</p> <p>HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.</p>
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Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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