



Augusta Power Stations

Dust Management Plan

Demolition and Site Rehabilitation

Flinders Power

Port Augusta

November 2016

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Document History

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Contents

1. Introduction & Purpose.....	3
2. Background.....	5
3. Setting	6
Stockpile	6
Ash Storage Area	6
Coal Conveyor System	7
Coal Storage Bins	7
Roadways.....	7
Demolition Activities	8
Utilities Available During Demolition	8
5. Environmental Conditions.....	14
EPA Notification of Process Changes.....	14
Licence Conditions.....	14
Ambient Dust Monitoring – PM10	16
Speciation	16
6. Dust Management Plan (DMP)	17
Plan Stakeholders - Roles and Responsibilities	17
Implementation and Control Actions	18
Table 1. Aspect and Control Action 1: Coal Stockpile Operations	20
Table 2. Aspects and Control Action 2: Ash Storage Area Management.....	21
Table 3. Aspects and Control Action 3: Coal Conveyor System and General Site	22
Table 4. Aspects and Control Action 4: Site Roads (General Conditions).....	23
Table 5. Aspects and Control Action 5: Demolition Activities	24
7. Ash Storage Area – Dust Management	26
Whole of ASA Dust Suppression Treatment.....	26
Trigger Action Response Plan – Ash Storage Area	26
8. Stockpile Area– Dust Management	29
Trigger Action Response Plan –Stockpile Revegetation	29
9. Dust Monitoring and Evaluation	30
10. Community and Stakeholder Engagement.....	31
10.1 Complaint Management.....	32
References	33
Appendices.....	34

1. Introduction & Purpose

Flinders Power operates the Flinders assets which comprise the Northern and Playford Power Stations in Port Augusta (known collectively as the 'Augusta Power Stations' (APS)), as well as the Leigh Creek Coal Mine. Flinders Power also maintains a dedicated rail line between Leigh Creek and Port Augusta.

Flinders Power is strongly committed to sound environmental management, as demonstrated within the board-endorsed Environment & Community Policy. The Policy states a commitment to partnering with the communities in which Flinders Power operates, and a focus on continual improvement of environmental performance.

The nature of the operation, if poorly managed, has the potential to create fugitive dust emissions which may adversely impact on the amenity of the local community. Therefore, the objectives of dust control are to:

1. Minimise and control the impact of Flinders Power closure activities on air quality and emission of dust from rail and site operations;
2. To ensure compliance with EPA Licence requirements;
3. Maintain environmental amenity and a strong relationship with the local community and regulatory authorities.

To achieve these objectives, a Dust Management Plan (DMP) has been formed. The objectives of the DMP are to:

- Nominate potential sources of dust emissions;
- Describe methods and responsibilities for dust management controls to minimise the potential for impacts to the environment;
- Clearly define the responsibilities and actions required to respond to environmental incidents; and
- Outline the monitoring and reporting arrangements to ensure ongoing compliance with the DMP.

Scope

This plan applies to activities covered under:

- EPA Licence 13006 (Northern & Playford Power Stations); and
- EPA Licence 13011 (Leigh Creek to Port Augusta Railway Operations).

This document is also part of the site Environmental Closure and Post Closure Plan where specific activities and responsibilities for performing dust management measures are assigned to the appropriate parties. During the site demolition process Flinders Power has specific responsibility for areas not covered by the plant demolition project. These areas, the Ash Storage Area and the Coal Stockpile Pad, are subject to separate rehabilitation and revegetation projects, covered in the Environmental Closure and Post Closure Plan.

Dust management activities involved with the decommissioning and demolition of the plant and structures on site are covered in the demolition plans developed under the Project Alliance Agreement.

2. Background

The Playford Power station (PPS) ceased operation in April 2012. The Northern Power Station (NPS) ceased operation on the 9th May 2016.

NPS and PPS utilised a supply of coal delivered daily by train from the Leigh Creek Coalfields. After combustion in the boilers, ash was collected from the bottom of the boiler, mixed into a seawater slurry and transferred to the Ash Storage Area by pipeline. Fly ash from the exhaust gas was captured by electrostatic precipitators at NPS, bag house filters at PPS, and then sold to secondary users with the excess transferred to the Ash Storage Area.

The Ash Storage Area was continually filled with deposited ash and sea water slurry from the boilers. The nature of this mixture allowed the surface to form a salt crust when it dried out - due to the ever-changing location of the deposition field creating high areas of ash. During heavy rain this surface crust was occasionally damaged allowing winds to disturb the ash and potentially blow it off site.

There was also a flooding regime for the Ash Storage Area, whereby internal levees were built up, filled with an ash/water mixture and then quickly released to allow for a large portion of the surface of the Ash Storage Area to be flooded so that a salt crust could re-form on top.

The coal stockpile at Augusta Power Stations was designed as an emergency supply, should mine site or railway operations be impacted. Historically the coal stockpile has been used on only intermittent occasions. However during the last few years of operation, due to increased variability in load profile in response to increased volatility in the SA energy market, the stockpile was utilised as a dynamic stockpile. The movement of coal on the stockpile became a frequent activity to meet strategic stockpiling or generation output needs as required. The increased use of the stockpile increased the risk of fugitive dust emissions.

To reduce these impacts during operation there were established Operating Instructions relating to the methods of stockpiling and reclaiming coal from the stockpile, the use of water cannons for wetting down the stockpile, the use of a water truck for applying dust suppressant to the surface of the stockpile water and a description of weather conditions for operations on the stockpile.

Whilst these actions were effective in reducing dust emissions from the stockpile and Ash Storage Area, a change in strategy, continued monitoring, vigilance and innovation is required to maintain control over dust emissions during the demolition and site rehabilitation phase.

Other identified sources of minor fugitive dust during this phase include roadways and during demolition of coal and ash handling plant.

3. Setting

The township of Port Augusta is located approximately 300km north of Adelaide on the northern tip of Spencer Gulf and has a Dry Arid Low Latitudes climate.

Figure 2 demonstrates the seasonal wind patterns for the region, including wind direction and wind speed. The charts indicate that strong regular southerlies are dominant during the summer season. Port Augusta township, especially the suburb of Willsden, is potentially affected by fugitive coal dust and ash for most of the year, except during winter when the dominant wind direction changes from southerlies to northerlies.

Stockpile

The distance between the coal stockpile and the closest residents in Port Augusta to the north is approximately 3.5km (refer to Figure 1 below). The Ash Storage Area is located between these two points.

Coal formerly arrived from the Leigh Creek mine in open rail wagons and was bottom dumped via the rail car dumper on the rail line near the coal stockpile. It was then conveyed to either the main coal storage bins for immediate use or to the stockpile for storage.

Maintaining the moisture level of the coal to a point where surface dust mobilisation is decreased from the stockpile was achieved by the use of water cannons on the stockpile.

The coal stockpile has been decommissioned and as of September 2016 the pad was being rehabilitated and revegetated. A sprinkler system has been established over the surface area to promote vegetation establishment and control dust.

Ash Storage Area

Waste ash from the boilers and the electrostatic precipitators was formerly mixed with seawater and piped to the Ash Storage Area.

Deposited ash formed a salt crust due to the evaporation of water from the mix which stopped the ash from being mobilised and entrained by wind into the airshed.

The levees on the edges of the Ash Storage Area were periodically raised to allow for a greater ash holding capacity.

During the operational period ash could enter the airshed during windy periods when the surface crust was damaged by heavy rain and after heavy machinery working on the ash dam has broken up the surface. A map of the Ash Storage Area is shown in Figure 3 with flood coffer dams numbered and the direction of floodwater flow during surface flooding events indicated.

Following NPS closure a number of measures were taken to control dust lift-off from the Ash Storage Area, including the installation of new pipework to ensure continued seawater supply, the construction of new coffer dams and the use of a temporary pump and pipework from Playford. Periodic filling of the coffer dams and breaching enabled seawater to flow out and re-establish a crust. However this continued operation was progressively causing erosion to the surface of the dam and the banks of the coffer dams, and certain areas such as the central discharge point were unable to be reached by flooding. In August 2016 a 15Ha area adjacent the original slurry discharge

point was sealed with dust suppressant applied by cropduster. This treatment was successful in containing dust from this area. Continued flooding to the east and west of this location caused further damage and in October 2016 it was decided to change strategy from seawater flooding to sealing the entire dam surface with dust suppressant.

These measures will achieve short-term dust control, particularly during summer 2016/17, while the long-term rehabilitation plans are being implemented. These actions are referenced in Implementation and Control Action 2.

Coal Conveyor System

The coal conveyor system begins at the train unloading facility at NPS. Coal was directed either to the coal storage bins or the coal stockpile by the conveyor system. Coal from the storage bins was conveyed to PPS or NPS as required. The coal conveyors are enclosed and the transfer points are inside a number of enclosed towers to reduce dust emissions.

Fugitive coal dust was formerly washed down daily from the inside of the conveyor enclosures and the transfer towers. The effluent was captured in sumps underneath the towers where the coal dust sediment was collected and returned to the stockpile area.

Following closure, clean-out of the conveyor lines and transfer towers occurred with all accessible coal washed to the ground where it could be contained and disposed. These control actions are described in the APS Environmental Closure and Post-Closure Plan.

Short term coal dust management measures are being applied during the demolition and rehabilitation phase. This is referenced in Implementation and Control Action 3 & 5.

Coal Storage Bins

There are three Coal Storage Bins at NPS with a capacity of 18,000 tonnes located to the west of the stockpile. These are enclosed, with a tripper on top conveyors and ploughs on the bottom conveyors. Both of these are enclosed to reduce dust emissions.

Coal bins at Playford were decommissioned and emptied in 2012.

Following closure, clean-out of the NPS bins occurred with all accessible coal washed to the ground where it could be contained and disposed. These control actions are described in the APS Environmental Closure and Post-Closure Plan.

Short term coal dust management measures are being applied during demolition of the bins. This is referenced in Implementation and Control Actions 3 & 5.

Roadways

There are a number of roadways, sealed and unsealed, around the site where dust settles and aggregates. Road vehicle speeds are kept to a 20 kmh limit on most roads, with two roads on site having a 40kmh limit, for both safety and environmental considerations.

The Ash Storage Area is surrounded by a levee system allowing vehicle access on top. Windblown ash can settle on the roadways and this is periodically sprayed with dust suppression chemical and wet down with a water truck to reduce dust lift off.

Dust control measures used pre-closure are continuing during the closure process. This is referenced in Implementation and Control Action 4.

Demolition Activities

Flinders Power (FP) and McMahon Services Australia formed an Project Alliance Agreement in May 2016 to facilitate the successful delivery of the site demolition program.

The Alliance is a unified team to jointly manage the planning, asset salvage and decommissioning works of the Augusta Power Stations. The successful delivery of this project relies on the combined efforts of both FP and McMahon Services, and the pooling of knowledge, experience and expertise under the Alliance is the best contractual means to deliver the complex closure program. The Alliance will see the partnership of both the Owner Party (FP) and Non-Owner Party (McMahon Services) to create a single team working unanimously, collaboratively, and cooperatively and acting in good faith to make best-for-project decisions.

FP have invaluable knowledge and expertise about the Augusta Power Stations. This knowledge is integral to ensure the safety of all personnel and management of environmental risks. McMahon Services has over 25 years of decommissioning experience conducting high risk demolition and hazardous materials removal works at sites across Australia. McMahon Services are a licenced entity by the SA EPA and are accredited to ISO 14001.

Each module of works within the delivery phase is defined by a unique scope of work with Flinders reserving the right to let independent work scopes.

Potential dust generating activities identified in the Project Risk Assessment Register include:

- Stack felling;
- Bin felling;
- General demolition activities;
- General civil works; and
- General site traffic.

Dust management measures are being incorporated into the demolition control plans, as referenced in the APS Environmental Closure and Post Closure Plan and Alliance Demolition Plans.

Utilities Available During Demolition

The majority of electricity used by major plant at the station was formerly provided by onsite generation. Following closure, there remain a number of small electricity supplies to the site, mainly into offices and workshops, though the main infrastructure utilised for dust control is provided by large standalone portable generators. A number of water pumps are used around the Ash Storage Area for seepage water and a portable diesel water pump can be deployed as required.

Seawater has been previously pumped from the cooling water inlet screens of NPS to the Ash Storage Area via an agreement with a third party to access power supplies. Additional pipework and outlets were installed on the southern side of the Ash Storage Area for targeted seawater flooding. Additional seawater was also obtained from the Playford Station seawater inlet using a portable diesel water pump for flooding the south-western corner of the Ash Storage Area.

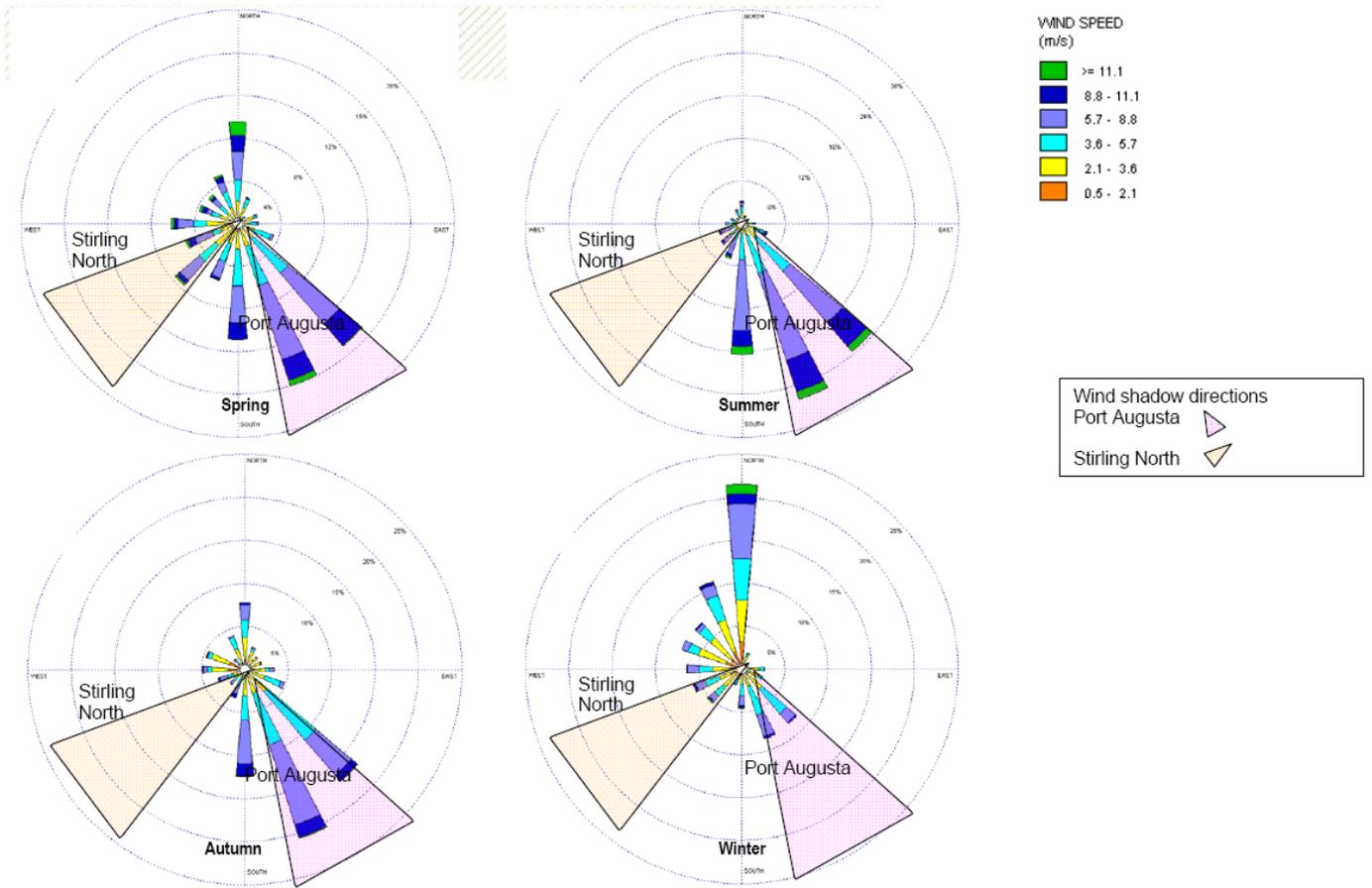


Figure 2 Seasonal Wind Profile



Figure 3 Ash Storage Area map showing numbered flood coffer dams and direction of floodwater flow during surface flooding events.

4. Supporting Documentation

The following document map outlines the role of the Dust Management Plan in meeting compliance obligations.

Governing Legislation	EPA Authorisations	Plans	Appendices & Supporting Documents
Environmental Protection Act 1993	EPA Licence 13006		
	Condition 1.1 Dust Prevention	APS Dust Management Plan (this document)	Appendix A: Ash Dam Interim Sealing – Proposal 7 th November 2016
	Condition 2.2 Complaints Register	FPP Incident Management System	Appendix B: Ash Dam Interim Sealing – Risk Assessment 21 st October 2016
	Condition 2.3 Develop and Implement Closure and Post-Closure Plan	Environmental Closure and Post Closure Plan – Augusta Power Stations	App A – Detailed Risk Assessments App B – NPS Make Safe Manual App C – PPS Closure Manual App D – Closure & Care Project Plan App E – Chemical & Oil Management Plan AppE1 – Chemical Manifest & Removal Scope App F – Demolition Alliance Supporting Plans App G - APS Dust Management Plan
	Condition 2.6 Generic Contingency Plan	Augusta Power Station Emergency Response Plan	App H – Project Risk Assessment Register
	Condition 2.7 Pollution Control Equipment Register	Refer Ellipse Maintenance Management System	
	Environmental Compliance Agreement		

(2000)

Section 1 Definitions
and Interpretations

Flinders Power
APS Ash Storage
Area End of Life
Plan Draft Cost
Estimate (14th
February 2000)

5. Environmental Conditions

The Augusta Power Stations operate according to the Environment Protection Act 1993 (SA).

The EP Act 1993 states the principle of a “general environmental duty”.

Part 4—General environmental duty

25—General environmental duty

(1) A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

The operation of the coal handling and storage system is an authorised activity under an Environmental Authorisation (Licence) under Part 6 of the EP Act provided by the EPA.

EPA Notification of Process Changes

According to the requirements of the Environment Protection Act 1993 and Licence Condition 4.2, the EPA must be notified when there is a proposed change to operating conditions that:

- May increase emissions or alter the nature of pollutants or waste; or
- May increase the risk of environmental harm; or
- Would relocate the point of discharge of pollution or waste.

Further, in accordance with section 83 of the Act, the EPA must be notified when serious or material environmental harm is caused or threatened.

FP commits to ensuring compliance with these obligations.

Licence Conditions

Note: *Environmental Authorisation 13006 is being reviewed (as of October 2016) by SA EPA and FP and is being amended to reflect the revised environmental monitoring requirements during the demolition and rehabilitation period. This section will be updated when the revised conditions have been finalised. This will include the development of a specific TARP for the Ash Storage Area.*

The Northern and Playford EPA licence, (13006) states specifically the activities for which APS undertakes.

Licensed Activities

The Licensee(s)

-Flinders Power Holdings GmbH, Flinders Labuan (No 1) Ltd, Flinders Labuan (No 2) Ltd is (are) authorised to undertake the following activities of environmental significance under Schedule 1 Part A of the Environment Protection Act 1993 (the Act), subject to the conditions of licence set out in the attached pages:

1(5)(a)	<i>Petroleum storage</i>
2(1)	<i>Abrasive blasting</i>
7(3)(C)	<i>Crushing, grinding or milling works (rock, ores or minerals)</i>
7(5)	<i>Coal Handling & storage</i>
8(2)(a)	<i>Fuel burning coal or wood</i>
8(7)	<i>Discharges to marine or inland waters (heat or antibiotic or chemical water treatments)</i>
8(6a)(a)	<i>Desalination plant that discharges wastewater to the marine environment</i>

Licence 13006 contains the following condition relating to dust on site:

S-9 Dust Prevention

The licensee must:

- *Take all reasonable and practicable measures to prevent dust leaving the Premises;*
- *Develop a Dust Management Plan to the satisfaction of the EPA; and*
- *Implement the Dust Management Plan approved in writing by the EPA (or any revised plan approved in writing by the EPA).*

Accordingly, Augusta Power Stations operates the former coal stockpile, coal handling plant and the Ash Storage Area in such a manner to reduce its effects on the environment, including the roads to and from the stockpile, and the levees on the ash storage area.

The following Licence condition relates to ambient air monitoring:

3.1 Ambient Monitoring and Reporting (U-124)

The Licensee must:

- 3.1.1 Continuously monitor ambient sulphur dioxide and ambient nitrogen dioxide at a location (or locations) within the Port Augusta township approved in writing by the EPA;*
- 3.1.2 Monitor ambient particulate concentrations (TSP and PM10) one day in six at a location (or locations) within the Port Augusta township approved in writing by the EPA;*
- 3.1.3 Undertake an investigation to determine the source of any exceedance(s) and provide to the EPA the outcomes of the investigation if following levels are exceeded at any monitoring location(s):*
 - a. Sulphur dioxide: 571 micrograms per cubic metre (determined as a one hour average);*
 - b. Nitrogen dioxide: 246 micrograms per cubic metre (determined as a one hour average);*
 - c. Particles (PM10): 50 micrograms per cubic metre (determined as a one hour average);*
- 3.1.4 Notify the EPA within seven days of any sulphur dioxide exceedance, as measured at the monitoring location(s) referred to in sub-condition (1); and*
- 3.1.5 Submit to the EPA on a monthly basis a summary of monitoring results for ambient particles (TSP and PM10), ambient nitrogen dioxide and ambient sulphur dioxide.*

The Railway EPA Licence (13011) contains condition S8, which states the licence holder must take all reasonable and practicable measures to prevent dust emissions, and includes the creation of a Dust Management Plan.

Ambient Dust Monitoring – PM10

Note: *Environmental Authorisation 13006 is being reviewed (as of October 2016) by SA EPA and FP and is being amended to reflect the revised environmental monitoring requirements during the demolition and rehabilitation period. This section will be updated when the revised conditions have been finalised. This will include the development of a specific TARP for the Ash Storage Area.*

To monitor the ambient air dust levels across the community there are a number of High Volume Air Samplers (HVAS) at strategic locations in Port Augusta and Stirling North. There are two types of HVAS, a total suspended particulate (TSP) type which samples all of the dust in the air and another for particulate matter 10 microns and smaller in diameter (PM₁₀). These samplers are set to run every sixth day in accordance with licence conditions. The results are provided to the EPA and the Port Augusta City Council on a monthly basis.

Speciation

One of the challenges in undertaking ambient monitoring for dust within the community is differentiating coal and ash particles derived from operational activities as distinct from natural regional dust. The township of Port Augusta and surrounding communities is located in a desert climate and is subject to frequent dust storms from the arid interior. The analysis of historical high ambient dust results against weather events shows a strong correlation with regional conditions.

Along with ambient air dust sampling, dust collected from various locations around the site, including along the railway and around the Ash Storage Area and town have been sampled to determine the coal and ash content.

Other methods to identify the sources of dust collected at monitoring stations are continually investigated.

The results of speciation work undertaken by the EPA or Flinders Power will be taken into account and the plan may be updated to reflect any requirements arising from these.

6. Dust Management Plan (DMP)

Plan Stakeholders - Roles and Responsibilities

Positions in Flinders Power have been identified and assessed as having direct influence over parts of the process involved with managing dust on the APS site. The responsibilities of such positions are described here to ensure clear and progressive lines of accountability and communication for the purpose of implementing this Plan.

Facility Manager APS

- Approve and support the DMP;
- Authorise the resources required to implement this plan;
- Consult with the Specialist Environmental Services to determine appropriate environmental management strategies and contingency measures required by the DMP;
- Install and maintain dust management infrastructure, including dust suppression sprays and cannons;
- Report actual and potential environmental incidents;
- Consult with the Specialist Environmental Services with respect to the management of contractors for decommissioning, demolition and rehabilitation activities that may affect the integrity and effectiveness of the DMP;
- Maintain dust management infrastructure to ensure ongoing effectiveness and reliability;
- Liaise with environmental and allied Regulators;
- Notification to Regulators of any adverse dust events;
- Notification to Regulators of any material changes to dust management controls; and
- Consult and liaise with community stakeholders.

Program Manager – Flinders Sites

- Review and approve the DMP;
- Provide advice and/or assistance to the Facility Manager APS to ensure the DMP is appropriately implemented in the workplace;
- Liaise with environmental and allied Regulators; and
- Consult and liaise with community stakeholders.

Specialist Environmental Services

- DMP document owner;
- Provide advice and or assistance to the Facility Manager APS to ensure the DMP is appropriately delivered and followed in the workplace;
- Audit activities associated with the DMP on a regular basis;
- Maintain, interpret and communicate dust monitoring results;
- Investigate DMP non-conformances or dust quality exceedences;
- Determine appropriate management strategies and implement contingency measures in consultation with the relevant manager/supervisor;
- Complete all required Internal and External reports required by the DMP;
- Ensure the Incident Management System contains the details of incidents and complaints related to the DMP; and
- Service and maintain ambient monitoring equipment in accordance with OEM instruction and the Environmental Monitoring Plan.

Environmental Coordinator

- Manage stockpile and Ash Storage Area operations in accordance with the provisions of this plan, in order to minimise the creation of fugitive dust;
- Support the Facility Manager APS to implement the actions of the DMP with the assistance of the Specialist Environmental Services; and
- Consult with the Specialist Environmental Services to determine appropriate environmental management strategies and contingency measures required by the DMP.

FP Project Management Team

- Manage stockpile and Ash Storage Area operations in accordance with the provisions of this plan, in order to minimise the creation of fugitive dust.

Land Management Team

- Maintain the Ash Storage Area to reduce dust generation;
- Inspect the Ash Storage Area, levees and batters, along with site roads, and perform dust suppression actions as required;
- Wash down coal dust and spillages from underneath conveyor structures and ash from under the boiler area;
- Maintain site vegetation; and
- Perform any other dust mitigation actions around site as necessary.

Alliance Team members (FP, McMahons Services and subcontractors)

- Implement Alliance Plans including Environmental Management Plan;
- Ensure appropriate dust management controls are applied for specific demolition activities e.g. charge felling;
- Undertake operation activities in accordance with relevant Flinders Power policies, procedures, management protocols, plans, statutory, licence and contract requirements;
- Implement appropriate environmental management measures; and
- Report actual and potential environmental incidents to the Facility Manager and Specialist Environmental Services via their supervisor.

Implementation and Control Actions

The Implementation and Control Actions in the DMP are based on the following specific items:

- Design and use of plant and equipment so as to control and minimise dust;
- Development and application of work procedures which reduce the potential for dust;
- Use of dust suppression techniques on the Ash Storage Area, coal storage and handling areas; and
- Development and implementation of auxiliary techniques to monitor weather conditions affecting site, in particular the Ash Storage Area in order to implement the Trigger Action Response Plan (TARP).

The following Tables (1 to 5) document the potential coal air quality/dust impacts with associated control plans.

This has been developed by utilising the 2014 Aspects and Impacts Register as the basis to identify the locations or activities with the highest risk of dust generation on the site, and updating these to reflect the requirements during closure activities.

The locations/activities have been ranked according to the highest residual risk for the environmental aspects contained in each.

Table 5 'Aspects and Control Action 5: Demolition Activities' specifically references the Alliance Project Risk Register which relates to dust control for demolition activities.

Table 1. Aspect and Control Action 1: Coal Stockpile Operations

The following action plan relates to the revegetation of the former stockpile area.

Augusta Power Stations Environmental Aspects and Impacts Register																
Ref No	Responsible Dept./Branch/Section	Activity/Location	Enviro Aspect	Enviro Impact	Legal & other requirements	Inherent Risk			Operational Controls		Residual Risk			Monitoring	Training	Note
			(cause)	(effect)		Consequence	Likelihood	Rating	Primary	Support	Consequence	Likelihood	Rating			
	FPP Project Management Team	Civil works on stockpile pad. Preparation for revegetation	Coal dust & wind blown soil	Air quality	EPP (Air Quality)	Major	Likely	Extreme-8	Dust Management Plan, Access to area during low wind speeds Water truck	Irrigation water sprinkler system	Minor	Possible	Mod-5	wind direction/speed, ambient monitoring, ad-hoc dust monitoring	Operator training	Closure period
23	Environmental Services	Coal stockpile management	Coal dust	Air quality	EPP (Air Quality)	Major	Likely	Extreme-8	Dust Management Plan, Sprays, Water truck,	Project Group	Minor	Unlikely	Low-4	wind speed/direction, ambient monitoring	Operator awareness	General conditions

General Control Matrix

Area	Potential impact	Potential contaminants	Rehabilitation Controls	Responsible personnel
Coal Stockpile and Tower Pad	Heavy machinery generating dust while operating on or near the stockpile where coal is present during revegetation activities and prior to vegetation becoming established. Air quality/dust movement off site due to wind speed and direction.	Coal dust, soil and surface dust.	Surface ripping during low winds (<35km/hr) Cease work when wind speeds increase (>35km/hr) Use of water truck to wet surface Allowing surface to harden Installation of irrigation system Revegetation of pad surface. Daily monitoring by Project Manager and Land Management Team. Additional revegetation as required.	FPP Project Management Team
			Use of dust suppression chemicals on open areas as required.	Environmental Coordinator
			Daily weather reports for wind speed & direction forecasting and provide advice to team.	Specialist Environmental Services

Table 2. Aspects and Control Action 2: Ash Storage Area Management

The following action plan relates to the management of the Ash Storage Area (ASA).

Ref No	Responsible Dept./Branch/Section	Activity/Location	Enviro Aspect	Enviro Impact	Legal & other requirements	Inherent Risk			Operational Controls		Residual Risk			Monitoring	Training	Note
			(cause)	(effect)		Consequence	Likelihood	Rating	Primary	Support	Consequence	Likelihood	Rating			
5	Environmental Services	Ash storage dam management	Dust emissions	Air quality	EPP (Air Quality)	Moderate	Possible	High-6	Dust Management Plan, dust suppression Chemical application to surface and levees, ASA Rehabilitation Project	APS Ash Storage Dam Inspection Checklist, JSP235 Vehicle operation in Ash Pond area	Moderate	Unlikely	Mod-5	daily inspections, ambient monitoring, 3 monthly inspections		

General Control Matrix

Area	Potential impact	Potential contaminants	Mitigation measures	Responsible personnel
Ash Storage Area	<p>Generation of dust from the main surface of the Ash Storage Area, including borrow pits on the south side</p> <p>Surface dust from main pipework outfall area</p> <p>Generation of ash from the inside of the western levee areas</p> <p>Generation of ash from the inside of the Eastern levee areas</p> <p>Southern levee surfaces and batters where wind-blown ash has settled</p>	Ash and surface dust.	<p>Use of dust suppression treatment on the surface of the ASA – Refer Appendix A and B.</p> <p>Trigger Action Response Plan (Refer to section 7).</p> <p>Use of water carts and additional dust suppression on banks and roadways as required</p> <p>Daily visual inspection and remedial works as required.</p>	<p>Facility Manager APS Environmental Coordinator McMahon Services</p> <p>Specialist Environmental Services</p> <p>Land Management Team</p> <p>Environmental Coordinator</p>

Table 3. Aspects and Control Action 3: Coal Conveyor System and General Site

The following action plan relates to the management of dust around the conveyor system and general site.

Augusta Power Stations Environmental Aspects and Impacts Register																
Ref No	Responsible Dept./Branch/Section	Activity/Location	Enviro Aspect	Enviro Impact	Legal & other requirements	Inherent Risk			Operational Controls		Residual Risk			Monitoring	Training	Note
			(cause)	(effect)		Consequence	Likelihood	Rating	Primary	Support	Consequence	Likelihood	Rating			
62	Flinders Project Services	Coal bin storage	Coal dust	Air quality	EPP (Air Quality)	Moderate	Possible	High-6	Enclosure, wash down of built up dust	Maintenance routines	Moderate	Rare	Mod-4	ambient monitoring, maintenance records		

General Control Matrix

Area	Potential impact	Potential contaminants	Mitigation measures	Responsible personnel
Conveyors	Residual coal dust generation from conveyors and bins around the station.	Coal dust.	Enclosed structures. Dust wash down (completed during Make Safe period). Defect /hazard reporting. Routine site inspection.	Environmental Coordinator
Open areas	Generation of dust from surfaces, such as underneath conveyors and towers where coal has spilled or dust settled.	Coal dust and surface dust.	Wash down with water hose when required.	Land Management Coordinator

Demolition Control Actions

Table 4. Aspects and Control Action 4: Site Roads (General Conditions)

The following action plan relates to the management of dust roadways around site.

Augusta Power Stations Environmental Aspects and Impacts Register																
Ref No	Responsible Dept./Branch/Section	Activity/Location	Enviro Aspect	Enviro Impact	Legal & other requirements	Inherent Risk			Operational Controls		Residual Risk			Monitoring	Training	Note
			(cause)	(effect)		Consequence	Likelihood	Rating	Primary	Support	Consequence	Likelihood	Rating			
21	Environmental Services	Road traffic	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Moderate	Possible	High-6	Speed limits on-site Routine road washing		Minor	Unlikely	Low-4	Site inspections		

General Control Matrix

Area	Potential impact	Potential contaminants	Mitigation measures	Responsible personnel
Roads	Generation of dust from road surfaces.	Coal dust and surface dust.	Water spray with water truck. Street sweeper (hired as required)	McMahons Facility Manager APS

Table 5. Aspects and Control Action 5: Demolition Activities

The following action plan relates to the management of dust during specific demolition activities.

Augusta Power Stations - Demolition Environmental Aspects and Impacts																
Ref No	Responsible Dept./Branch/Section	Activity/Location	Enviro Aspect	Enviro Impact	Legal & other requirements	Inherent Risk			Operational Controls		Residual Risk			Monitoring	Training	Note
			(cause)	(effect)		Consequence	Likelihood	Rating	Primary	Support	Consequence	Likelihood	Rating			
	McMahons	Road traffic during demolition activities, removal of material off site	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Moderate	Possible	High-6	Pre-task JSEA, Site vehicle speed limits. Routine road washing with water truck	McMahons - Demolition, Environmental Management & Hazardous Materials Plans	Minor	Unlikely	Low-4	Ambient dust monitoring, site inspections/supervision		
	McMahons	General Demolition Activities	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Major	Likely	Extreme-8	Pre-task JSEA, Water spray with water truck. Water areas with water hoses.	McMahons - Demolition, Environmental Management & Hazardous Materials Plans	Moderate	Unlikely	Mod-5	Ambient dust monitoring, site inspections/supervision		
	McMahons	General Civil Works	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Major	Likely	Extreme-8	Pre-task JSEA, Water spray with water truck. Water areas with water hoses.	McMahons - Demolition, Environmental Management & Hazardous Materials Plans	Moderate	Unlikely	Mod-5	Ambient dust monitoring, site inspections/supervision		
	McMahons	Stack Felling	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Major	Likely	Extreme-8	Pre-task JSEA, Water spray with water truck. Industrial mist fans	McMahons - Demolition, Environmental Management & Hazardous Materials Plans	Moderate	Unlikely	Mod-5	Ambient dust monitoring, site inspections/supervision		
	McMahons	Bin Felling	Dust emissions	Air quality	EPP (Air Quality), EPA Licence 13006 Cond No 1.1	Major	Likely	Extreme-8	Pre-task JSEA, Water spray with water truck.	McMahons - Demolition, Environmental Management & Hazardous Materials Plans	Moderate	Unlikely	Mod-5	Ambient dust monitoring, site inspections/supervision		

Alliance Project Risk Assessment Register – Dust from demolition activities – extract:

Asset Issue or Improvement Opportunity						Inherent Risk Rating			Residual Risk Rating					Proposed Mitigation of Risk Exposure / Improvement Actions			Target Risk Rating		
Owner	Category	Issue	Cause	Potential Consequences	Exposure Type	Consequence	Likelihood	Rating & Priority	Current Approach (Existing Controls)	Effectiveness	Consequence	Likelihood	Rating & Priority	Risk Reduction Treatment or Asset Improvement Strategic or Approved Action	Action Owner	Planned Completion Date	Consequence	Likelihood	Rating & Priority
RT/TC	Environment	Excessive release of dust during demolition activities	Mass collapse of structure, weather conditions - wind increase. Removal of bitumen exposing earth beneath, plant movement on site generating dust.	Damage to the environment via dust pollution, loss of flora / fauna, loss of program, litigation / financial / company branding.		2. Major	C. Likely	High 7	Water shall be utilised for the purpose of dust suppression during demolition activity via air misters, spotters with milk hoses suppressing dust during works as well as pre-wetting materials before demolition activity commences, water cannons built into large excavators (PC1250) spraying during demolition activity. Plant movement minimised where possible to prevent excessive generation of dust. If required water cart utilised to suppress / seal ground area. Reduced activity during high winds. Dust monitoring using visual and electronic monitors.	Effective	3. Moderate	D. Possible	Medium 16				3. Moderate	D. Possible	Medium 16

General Control Matrix (for Table 5. Aspects and Control Action 5: Demolition Activities)

Area	Potential impact	Potential contaminants	Mitigation measures	Responsible personnel
Stack Felling	Generation of dust.	Coal dust, ash and surface dust.	Vehicle speed limits. Water shall be utilised for the purpose of dust suppression during demolition activity via air misters, spotters with milk hoses suppressing dust during works as well as pre-wetting materials before demolition activity commences, water cannons built into large excavators spraying during demolition activity. Plant movement minimised where possible to prevent excessive generation of dust. If required water cart utilised to suppress / seal ground area. Reduced activity during high winds. Dust monitoring using visual and electronic monitors. Community and stakeholder engagement and information sharing of demolition events with potential for significant dust generation which may have an adverse effect on the community.	McMahons Facility Manager APS
Coal Bin Felling	Generation of dust.	Coal dust, ash and surface dust.		McMahons Facility Manager APS
General demolition activities	Generation of dust.	Coal dust, ash and surface dust.		McMahons Facility Manager APS
General civil works	Generation of dust.	Coal dust, ash and surface dust.		McMahons Facility Manager APS
Site traffic for demolition material removal	Generation of dust.	Coal dust, ash and surface dust.		McMahons Facility Manager APS

7. Ash Storage Area – Dust Management

The current approach (October 2016) for dust management on the Ash Storage Area (ASA) utilises regional weather predictions of wind speed and direction to inform activity planning and the implementation of dust management measures on the ASA.

Historically, infrequent events have occurred whereby rainfall on the ASA during the spring and summer months has caused the salt crust on the surface, created by surface sweater/ash slurry flooding, to deteriorate and allow ash to become airborne in strong winds. These events are taken into consideration when planning activities and dust suppression measures on the ASA.

Whole of ASA Dust Suppression Treatment

Conditions on the ASA since closure has shown that the normal dust suppression activities used (coffer dam building and surface flooding) have damaged the ASA surface, allowing fine ash to be lifted from the surface. A review of the dust suppression methods used on the ASA has determined that the optimal method of dust suppression is to seal the whole of the ASA surface with a dust suppression treatment.

An initial area of 15Ha in the middle of the ASA was sealed with dust suppression chemical which was applied by crop duster airplane. The results of the sealing of this initial area were positive and after severe weather events during September and October 2016 causing large ash lift off events from the remainder of the ASA and dangerous conditions for machinery on the ASA levee banks it was decided to investigate the sealing of the whole of the main ASA.

A proposal for the sealing of the ASA was developed and provided to the EPA on the 21st of October 2016. A project scope for sealing the ASA was provided to the demolition contractors and the project is planned for implementation in November 2016.

Trigger Action Response Plan – Ash Storage Area

A Trigger Action Response Plan (TARP) has been developed, incorporating the “stoplight” performance monitoring tool and visual site inspections as the triggers.

A newly installed ambient dust monitoring system will also be used to inform site staff of “real time” airborne dust levels around the ASA and in two community monitoring sites. These “real time” levels will be used to determine the need to implement the TARP. The level of airborne dust (measured in $\mu\text{g}/\text{m}^3$) at which the TARP is implemented is to be determined in consultation with the EPA using initially observed levels. The equipment is due to be installed mid December 2016.

The mitigation responses will be drawn from the Aspect Control Actions appropriate for the identified triggers. The site Incident Management System (IMS) will be used as the action assignment and data recording tool.

This TARP will be communicated to the appropriate site stakeholders to ensure appropriate actions are taken to mitigate dust from specific identified areas/activities on site.

The Ash Storage Area has been identified as the key area for dust management and a three tiered process using wind forecasts has been developed, with a daily weather forecast utilising a Red-Yellow-Green “stoplight” type format. Daily weather reports are to be reviewed for wind speeds forecasted to be over 35kmh in the proceeding days and a weather forecast chart will be used to identify times where activities can and cannot take place on the Ash Storage Area.

The chart below shows an example of the weather forecast used for stockpile movements.

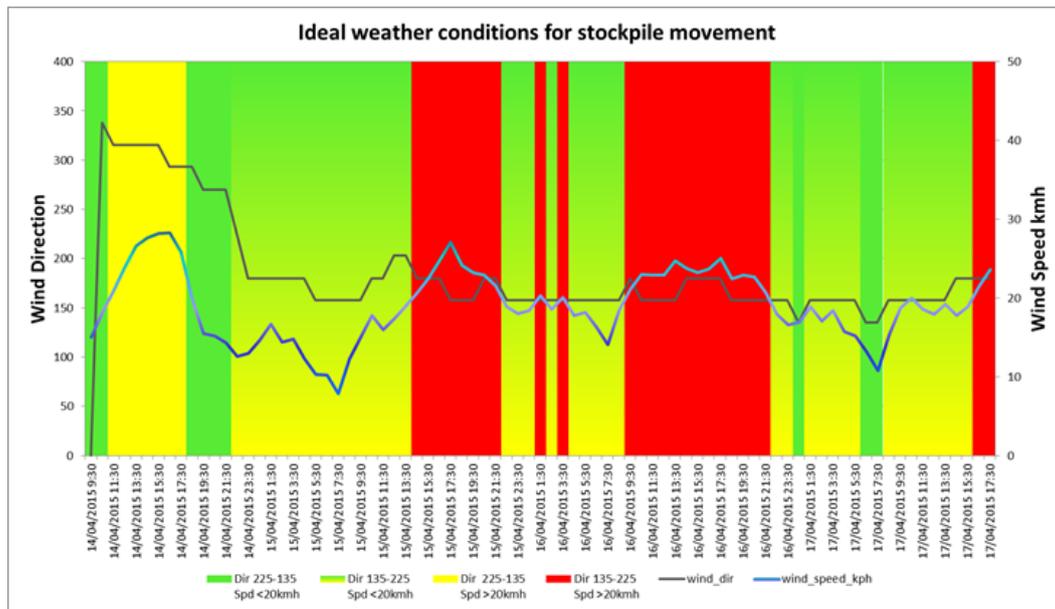


Figure 4 Example ‘stoplight’ TARP system for controlling activities in the APS stockpile.

The ‘stoplight’ format will be used for a green band to show when potentially dust generating activities with heavy plant can take place.

A red band will show when potentially dust generating activities on the Ash Storage Area must cease according to the following:

Any activities during a wind speed over 35 kp/h (9 m/s or 19 knots).

Preparation for dust suppression during high wind speed events are as follows:

- Surface inspections to determine areas with high dust risk;
- Increase dust suppression application on levees and batters; and
- Increase use of water truck around perimeter

On high wind speed days the following precautions will be undertaken where appropriate:

- Ensure safety of site staff and visitors;
- Monitor wind speeds using Bureau of Meteorology data;
- Cease work activities on the Ash Storage Area;
- Surface inspections to determine if ash is blowing off;
- Targeted action for high risk accessible areas; and
- Notify stakeholders if required (Port Augusta City Council, community and SA EPA).

When a community complaint regarding dust is received by the company, activities on the Ash Storage Area will be reviewed and ceased if deemed appropriate, by the Flinders Power Facilities Manager.

8. Stockpile Area– Dust Management

The NPS Coal Stockpile pad has been rehabilitated and revegetation of the surface is in progress.

Whilst the vegetation is established the existing Coal Stockpile TARP will be followed, as below.

Trigger Action Response Plan –Stockpile Revegetation

A (TARP) has been developed for revegetation work on the stockpile, incorporating the “stoplight” performance monitoring tool and visual site inspections as triggers.

Stockpile revegetation has been identified as a key area for dust management and the stoplight” Red-Yellow-Green weather forecast will also be used during activities on the stockpile pad.

The ‘stoplight’ format will use a Green band to show when potentially dust generating activities with heavy plant can take place according to the following weather conditions:

Any activities during a wind speed below 20kp/h (6 m/s or 11 knots) from the SOUTH EAST to SOUTH WEST.

A Yellow band will show the hours when potentially dust generating activities with heavy plant can take place according to the following:

Any activities during a wind speed over 20kp/h (6 m/s or 11 knots) from any wind direction other than from the SOUTH EAST to SOUTH WEST.

A Red band will show the hours when potentially dust generating activities with heavy plant cannot take place:

Any movement activities during a wind speed over 20kp/h (6 m/s or 11 knots) from the SOUTH EAST to SOUTH WEST.

9. Dust Monitoring and Evaluation

Note: *Environmental Authorisation 13006 is being reviewed (as of October 2016) by SA EPA and FP and is being amended to reflect the revised environmental monitoring requirements during the demolition and rehabilitation period. This section will be updated when the revised conditions have been finalised. This will include the development of a specific TARP for the Ash Storage Area.*

Ongoing dust monitoring, by either visual evaluation of ash/coal dust generation on site or by presence of ash or coal in high volume air sample filters, will determine if dust mitigation measures are effective or required in specific circumstances.

Groups responsible for inspections are described in the Action tables.

10. Community and Stakeholder Engagement

Community and stakeholder engagement is detailed in the APS Closure and Post Closure Environmental Plan.

A summary of these mechanisms are outlined below.

Mechanism	Target Group							Posted on FP website?	Frequency	Notes
	Residents	PACC	MP	Media	EPA	NRM Board	Special-interest groups			
Weekly progress report		X	X		X			No	Weekly	A summary of activities at the site, including demolition and ash dam rehabilitation
Face-to-Face meetings		X						N/A	Monthly	Monthly meetings with PACC CEO and Mayor, when available.
Annual environmental presentation		X						Yes	Annual	Annual presentation to PACC – open public forum.
Media release/ Infomercials	X			X				Yes	Ad-hoc	Strategic media release e.g. felling of PPS A station stack
Works Progress Fact Sheet	X	X	X	X				Yes	Monthly	A monthly progress update. Letter drop
Focus topic fact sheet	X	X	X	X	X	X	X	Yes	Ad-hoc	A brochure on a particular topic (e.g. ash dam, Playford A building demolition). Letter drop.
Flinders Power website	X	X	X	X	X	X	X	Yes	Regular updates	Information portal. Links to FP YouTube account. FP contact details.
Flinders Power hotline & email	X			X			X	Yes	N/A	All community complaints are logged.
Special-interest presentations							X	N/A	On request	Community presentations or site visits to be conducted on request.
Community forum/	X								Ad-hoc	As required basis.

reference
group

Flinders power is also performing community sentiment monitoring using the following

- Daily media monitoring – print, TV, radio and online
- Complaints hotline & email – central recording
- Facebook – linked with community forums
- FP personnel embedded within the community
- Close relationships with PACC, MP's, local media and community leaders.

10.1 Complaint Management

Community complaints regarding nuisance coal dust and ash are to be dealt with according to the Complaint Handling Procedure contained in Appendix C.

References

Aurecon, 2010. Alinta Northern Power Station, Stockpile Dust Management, Flinders Power, Report ref: 206865-001-01, 9 September 2010

Environment Protection Act 1993 (SA)

EPA Licence 13006 (Northern and Playford Power Station)

EPA Licence 13011 (Leigh Creek to Port Augusta Railway Operations)

Flinders Power Environment & Community Policy (June 2016)

Appendices

Appendix A: Ash Dam Interim Sealing – Proposal 7th November 2016

Appendix B: Ash Dam Interim Sealing – Risk Assessment 21st October 2016

Appendix C: Complaint Handling Procedure

Complaint Handling Procedure

All complaints received by Flinders Power employees, including security, are handled according to the following steps.

All complaint receivers are required to:

- Collect all details from the complainant (time, location, concerns)
- Repeat back and confirm details with the complainant
- Obtain complainants contact details
- Advise relevant Supervisor immediately

The Facility Manager and the Specialist Environmental Services are to be advised as soon as practicable of receipt of the complaint.

The complainant will be contacted and an investigation of the complaint initiated as soon as practicable of the receipt of the complaint. The investigation typically may include:

- A visit to the complainant to:
 - Observe local dust conditions;
 - Discuss the event with the complainant; and
 - Taking of samples.
- A review of site data from the time of the incident.
- A review of meteorological data.

Following the investigation, the complainant is to receive a written response outlining the investigation procedure and findings. If requested the findings of the investigation will be explained and discussed with the complainant in person.

Details of the complaint, the investigation, management actions implemented and follow up is recorded within the FP Incident Management System.

All media enquiries are to be managed through the approved Flinders Power Media Protocols.

21st October 2016

Sealing the APS Ash Dam Using VITAL Bon-Matt Stonewall- PROPOSAL

Background

A key hazard associated with the management of the Ash Dam is the control of dust. While the Northern and Playford Power Stations were operational, this was achieved by the ongoing pumping of an ash/seawater slurry into the dam. The slurry would find a natural path across the dam, and keep the surface saturated. High spots would effectively self-seal through the formation of a salt crust. During operations risk events would be experienced when heavy rainfall, followed by strong drying winds, would dissolve the crust and lead to the potential generation of dust. Typically however these events would be short-lived until the slurry once again seals the surface. The borrow pits at the southern extent of the ash dam could also be filled, then released to flood out over the ash dam and re-establish the seal.

At cessation of generation on May 9th 2016 it was assumed that a similar management strategy would be successful to control dust until the long-term rehabilitation plans were commenced. The strategy adopted included the building of additional coffer dams at the southern end of the ash dam, filling these with seawater via a newly installed pipeline, then breaching the wall to flood out over the dam. Additional strategies were employed, including the installation of new outfall pipework, construction of new internal levees, the installation of a second water supply pipeline from Playford, and the ongoing use of dust suppressant and water carts.

In August 2016 it was noted that an area of the ash dam adjacent the former slurry discharge point was deteriorating quickly. This area is at a higher elevation and unable to be flooded. Also, a release of water over this area would cause irreversible erosion of the loose surface material and may exacerbate the risk of future dust events. It was decided that a quick solution was required to prevent dust lift-off from the area. Subsequently a 15Ha area was sealed using a cropduster applying Vital Bon-Matt Stonewall to the surface. The application was successful and this area has held well over the previous 2 ½ months, despite extreme weather conditions over the period.

Continued seawater flooding to the east and western sides has created ongoing challenges, including:

- The flood process is causing erosion of the surface layer of ash. Previously the slurry would form a smooth seal. However the use of pure seawater is tending to cause rills and gullies, leading to damage to the surface which is then more susceptible to dry-out and wind erosion.

- The retention of water in the southern coffer dams is undermining the banks, leading to local destabilisation of the banks. On 1st October a failure occurred where a portion of a bank, with an excavator parked on top of it, failed internally to the dam, submerging the excavator.
- Continued flooding is not maintaining sufficient water on the surface. During the hot summer months this will be a risk of dam dry-out leading to additional areas being at risk of wind erosion.
- Plans for the long-term management strategy of the dam are being formed, with capping using locally available topsoil being the preferred option. One of the key risks to construction is the ability to place earthmoving equipment on the dam surface. A trial of a low ground-pressure tractor on 11th October was not successful, highlighting the construction risks due to sub-surface moisture. Commencing the dewatering of the dam and polishing pond surface will assist to mitigate these risks during the construction phase.

Licence Conditions

Thus proposal is developed in accordance with Licence 13006, in particular condition U-251 requiring Flinders Power to 'Develop and Implement Closure and Post-Closure Plan'.

Management Plan

Flinders Power is cognisant of its environmental obligations and is keen to address the issues associated with dust events arising from the ash dam. The alternate management strategy outlined in this proposal entails ceasing the practice of seawater flooding and sealing the entire surface of the ash dam with Vital Bon-Matt Stonewall. The product will be applied using a combination of spraying from the banks and aerial spraying. The application will have the immediate benefit of:

- Reducing the risks associated with dust events;
- Commencing the dam dry-out during the summer months to enable plant access for rehabilitation works; and
- Forming a seal over the ash dam to manage dust generation during the long-term rehabilitation works. Continuing flooding during that period would not be possible. The application of the sealant will ensure that only those areas being actively worked will be exposed for dust generation, and can be readily managed by the work crew.

Vital Bon-Matt Stonewall

The product is manufactured and supplied by Vital Chemicals, an Australian owned and operated company based in Brisbane. The active ingredient is a styrene acrylate copolymer which is a stable inert non-hazardous chemical that acts as a binding agent to form a hard crust once dry. A green dye is used in the product so that the treated areas can be seen. The product has been assessed by independent environmental chemists who have deemed the product as a low risk of toxicity to humans and the environment. The South Australian EPA endorsed the use of the product for the

application across the 15Ha area. The product has been successfully used across a number of sites, including:

Vital Chemicals sent their Environmental Business Development Manager to witness and provide technical support for the application of the product for the 15Ha area. The company provided advice to Flinders Power that they were satisfied with the application of the product and could commend a lifespan of approximately 12months. The Vital Chemicals General Manager/Senior Scientist has also provided ongoing technical support throughout the planning and application of the 15Ha area.

Product technical specifications are provided as attachments to this proposal.

Application Period

Following approval for use there is an approximate 3 week lead time for order and supply of the material. The application process is anticipated to take 3weeks, subject to weather conditions.

Risk Assessment

An environmental and social risk assessment has been conducted for the works, and is provided as an attachment. A safe work method statement will also be prepared to identify the risks to health and safety associated with the application process.

Contingency Planning

Whilst Flinders Power is confident that the use of the dust suppressant will be an effective seal, it is noted that this is the first application of its kind on a large-scale ash dam. Therefore, the ongoing monitoring of the effectiveness of the solution will be critical. Should the control plan not be successful in managing dust, the following contingency measures will be considered and adopted where appropriate and in collaboration with the EPA. In order of preference the following measures will be taken:

1. If discreet areas have not been successfully sealed, apply further product using:
 - a. Water cart application from the banks, where at-risk areas can be reached; or
 - b. A boom-mounted spray on a buggy; or
 - c. Use of a 'pistenbully' all-terrain vehicle with a trailer attachment; or
 - d. Use of an aircraft.

2. If the product deteriorates or does not form an effective seal, Flinders will consider:
 - a. Re-application of the product; or
 - b. Use of an alternate product; or
 - c. Acceleration of the long-term rehabilitation plans, targeting areas of high risk for dust generation; or
 - d. Reverting to seawater flooding. It should be noted that this is a last resort option, as it will promote the migration of the dust sealant and is unlikely to be successful due to the aforementioned challenges.

Monitoring

The monitoring programs will consist of:

- Daily inspections. During Monday-Friday these inspections are carried out by the Land Management Team. On weekends a general site inspection is carried out by Security. Should any works be required on the weekend the Facility Manager, or delegate, will be available on call.

- Ambient dust monitoring. A revised monitoring program is being finalised, however the conceptual plan is:
 - o The installation of a real-time PM10 dust monitoring station at Lea Memorial Oval and Stirling North. These monitoring stations will replace the existing high-volume samplers that operate on a 1:6 day basis in accordance with the existing licence conditions.
 - o The installation of 3 x PM10 boundary monitors surrounding the ash dam, to act as real-time indicators of dust risk and inform the Trigger Action Response Plan within the Dust Management Plan. A weather station will also be installed at the boundary to provide real-time wind speed and direction data to inform the TARP.

The ambient monitoring will provide an indication of the success of the short-term dust suppressant, and will be utilised throughout the rehabilitation works to monitor the management of dust.

Timeline

The anticipated timeline for interim sealing and long-term rehabilitation planning is provided below. Detailed planning is occurring currently, and the following should act as a guide only.

	Oct-16	Nov-16	Dec-16	Q1 2017	Q2 2017	Q3 2017	Q4 2017	2018
Interim Sealing								
Submit proposal to EPA	X							
Prepare & conduct community communication	X							
Conduct sealing application		X						
Commence polishing pond infill works ¹		X	X					
Monitoring								
Select and order ambient monitoring equipment	X							
Receive, install and commission ambient monitoring equipment		X	X					
Ash Dam Rehabilitation								
Select preferred contractor	X							
Commence seed collection	X							
Develop detailed plans & submit to EPA		X						
Approval to commence works			X					
Commence earthworks				X				
Stormwater controls				X				
Conduct seeding					X			
Fertiliser & water application, as required						X	X	
Ongoing monitoring & maintenance, including re-seeding, civil works, fertiliser, water application etc if required							X	X

¹ These works will commence as soon as lake dry-out occurs and it is physically possible to access the area.

Dust Management Plan

Should this proposal be accepted by the SA EPA, a variation will be made to the Dust Management Plan, and the document re-issued for approval.

Community Engagement

Flinders Power acknowledges the strong community interest in the closure program and has been proactively engaging with the local community since the closure announcement in June 2015. Flinders management regularly meets with the Port Augusta City Council and provides a progress update report on a weekly basis. A project newsletter is also circulated and posted on the Flinders Power website on a monthly basis.

The risk assessment has identified community relations as a key risk.

Flinders Power proposes to engage proactively with residents to inform them of changes to the management of the Ash Dam and polishing pond. A newsletter is being prepared to provide the community with background information as to why the change is important, and to educate them of potential risks throughout the rehabilitation works, including:

- Aerial spraying (eg noise from the aircraft and risk controls to prevent overspray);
- Odour from the polishing pond;
- Dust generation while earthworks are being conducted; and
- Noise during earthworks.

Other community engagement mechanisms, such as the development of a community reference group, or conducting community information sessions, will be considered by FP.

The Port Augusta City Council will be briefed on the project proposal. Local media will also be proactively engaged.

Polishing Pond

The risk assessment has identified risks associated with the drying out of the polishing pond. The primary risk relates to odour associated with decaying organic material.

Drying out the polishing pond is an important measure prior to commencing rehabilitation works. As the pond consists of very fine ash, it is assumed that the substrate will be extremely soft and saturated, making access by earthmoving equipment difficult.

To manage this risk, it was anticipated that the following works would be required:

- Remove any remaining floating cenospheres from the boom interceptors at the Hospital Creek outlet;
- Raise the ash dam decant outlets to prevent water flow to the polishing pond;
- Commence drying out of polishing pond;

- Commence progressive in-fill of the pond using ash sourced from the borrow pit walls at the southern end of the ash dam.
 - o Utilise dust suppressant techniques on the borrow pit areas to prevent the generation of dust (water carts and dust suppressant chemical application).
 - o Utilise dust suppressant techniques (water carts) to minimise the generation of dust along haul roads between the ash dam and the polishing pond, as required;
- Seal the ash cover within the polishing pond with dust suppressant;
- Place a topsoil layer over the surface;
- Direct seed; and
- Irrigate and fertilise area as required.

Detailed rehabilitation planning for the polishing pond has commenced in conjunction with the contract partner McMahon Services. Planning works for the polishing pond will be a priority and will commence as soon as physically possible to do so.

Progressive sealing with ash from the banks will occur as the polishing pond progressively dries.

Alternate measures to reduce the risks associated with odour will be investigated.

Ash Dam Rehabilitation

Detailed rehabilitation planning for the ash dam has commenced in conjunction with the contract partner McMahon Services. Project concepts have been provided to the EPA.

Attachments

- Risk Assessment – Ash Dam Interim Sealing
- MSDS Report – Vital Bon-Matt Stonewall
- Environmental Assessment of Vital Bon-Matt Stonewall (Simmonds & Bristow, August 2012)
- Review of Aquatic Ecosystem Risks Associated with the use of Erosion and Dust Control Products (Vital Bon-Matt P47-VR1 and Vital Bon-Matt Stonewall)in Western Queensland (Gauge Industrial and Environmental Pty Ltd, June 2015)
- Vital Bon-Matt Stonewall Data Sheet

**ASH DAM INTERIM SEALING
AUGUSTA POWER STATIONS - 21st OCTOBER 2016**

Risk Identification							Inherent Risk Rating			Residual Risk Rating					Proposed Mitigation of Risk Exposure / Improvement Actions			Target / Future Risk Rating				
ID	Category	Source	Pathway	Receptor	Potential Consequences	Exposure Type	Consequence	Likelihood	Rating & Priority	Current Approach or (Existing Controls)	Effectiveness	Consequence	Likelihood	Rating & Priority	Risk Reduction Treatment or Asset Improvement Strategic or Approved Action	Action Owner	Planned Completion Date	Consequence	Likelihood	Rating & Priority		
RISK SCENARIO 1 - MAINTAIN CURRENT PRACTICES																						
RS1-01	Dust	Ash dam dust particles	Off-site migration by strong winds	Member of the public	Adverse health impacts caused by particulate exposure	Compliance	2. Major	B. Probable	Extreme 4	Continue seawater flooding in accordance with the existing Dust Management Plan	Marginal	2. Major	B. Probable	Extreme 4	Review alternate control strategies	Flinders						
				Surrounding environment	General nuisance					15Ha sealed area	Effective											
				Alliance workforce	Adverse media / PR / Political					Dust suppressant and water cart application on accessible areas only	Marginal											
					Breach of licence conditions																	
RS1-02	Environmental	Seawater/ash mixture in southern coffer dam	Failure of coffer dam wall caused by weakening/undercutting, leading to loss of containment	Adjacent environment	Site clean-up required. Repair works to coffer dam wall	Safety Environment	3. Moderate	D. Possible	Medium 16	Regular wall inspections	Marginal	3. Moderate	D. Possible	Medium 16	Review alternate control strategies	Flinders						
				Personnel & plant in vicinity of breach	Safety implications for personnel & plant if failure occurred					Wall maintenance	Marginal											
RS1-03	Safety	Saturated ash	Inability of construction plant to safely operate on ash dam surface	Personnel & plant	Loss of equipment	Safety Equipment	3. Moderate	C. Likely	High 11	Commence dam surface dry-out during summer 2016	Marginal	3. Moderate	E. Unlikely	Low 21								
					Safety impact to operator						Selection of suitable earthmoving equipment											Effective
					Delays for the ash dam rehabilitation works program						Contingency planning											Effective
RISK SCENARIO 2 - CEASE SEAWATER FLOODING & IMPLEMENT INTERIM SEALING																						
RS2-01	Community	Polishing pond dry-out leading to decaying organic material in the polishing pond	Airborne odour	Neighboring community	General nuisance leading to public complaints	Community relations	2. Major	B. Probable	Extreme 4	Early community engagement and provision of information	Marginal	2. Major	E. Unlikely	Medium 18	Progressive monitoring. Seek alternate measures as required	Flinders						
					Adverse media / PR / Political						Sealing with ash and soil											Effective
					Regulator intervention																	
RS2-02	Community	Insect breeding in stagnant water pools (mosquito,	Airborne	Neighboring community	General nuisance leading to public complaints	Community relations	3. Moderate	D. Possible	Medium 16	Sealing with ash and soil	Effective	3. Moderate	D. Possible	Medium 16	Progressive monitoring. Seek alternate measures as required	Flinders						

**ASH DAM INTERIM SEALING
AUGUSTA POWER STATIONS - 21st OCTOBER 2016**

Risk Identification							Inherent Risk Rating			Residual Risk Rating					Proposed Mitigation of Risk Exposure / Improvement Actions			Target / Future Risk Rating		
ID	Category	Source	Pathway	Receptor	Potential Consequences	Exposure Type	Consequence	Likelihood	Rating & Priority	Current Approach or (Existing Controls)	Effectiveness	Consequence	Likelihood	Rating & Priority	Risk Reduction Treatment or Asset Improvement Strategic or Approved Action	Action Owner	Planned Completion Date	Consequence	Likelihood	Rating & Priority
		midge fly etc) of the polishing pond during dry-out			Adverse media / PR / Political Regulator intervention															
RS2-03	Community	Lack of water throughflow to Bird Lake	N/A	N/A	Bird Lake progressive dry-out leading to odour, insect and loss of amenity. Potential for community to blame Flinders Power	Community relations	3. Moderate	B. Probable	High 8	Early notification and engagement with PACC	Marginal	3. Moderate	C. Likely	High 11	Continued engagement of FP with PACC and EPA.	Flinders				
									Adverse media / PR / Political	Marginal										
									NOTE: Bird Lake is not on FP land											
RS2-04	Environmental	Dust suppressant migration to neighboring environment (land and marine)	Wind-blown during application	Neighboring land	Adverse ecological effects	Environmental	3. Moderate	C. Likely	High 11	Selection of environmentally safe and non-toxic dust suppressant - Vital Bon-Matt Stonewall	Effective	4. Minor	D. Possible	Low 20	Monitoring and supervision by FP personnel during the application process	Flinders				
									Adverse media / PR / Political	Effective										
									Regulator intervention	Effective										
									Spray from banks using a watercart to seal outer margin and prevent the risk of overspray from cropduster	Effective										
									Use of plane fire bomb hatch rather than misters to increase particle size	Effective										
									Only apply during favourable weather conditions	Effective										
									Lift decant outlets on the ash dam to prevent surface water outflow	Effective										
									Use of meteorological data to inform cut-off for plane activities - Port Augusta Airport and/or ash dam met station (if installed prior to activity)	Effective										
	Land-based application for the polishing pond	Effective																		

**ASH DAM INTERIM SEALING
AUGUSTA POWER STATIONS - 21st OCTOBER 2016**

Risk Identification							Inherent Risk Rating			Residual Risk Rating					Proposed Mitigation of Risk Exposure / Improvement Actions			Target / Future Risk Rating				
ID	Category	Source	Pathway	Receptor	Potential Consequences	Exposure Type	Consequence	Likelihood	Rating & Priority	Current Approach or (Existing Controls)	Effectiveness	Consequence	Likelihood	Rating & Priority	Risk Reduction Treatment or Asset Improvement Strategic or Approved Action	Action Owner	Planned Completion Date	Consequence	Likelihood	Rating & Priority		
										Block polishing pond outlet to Hospital Creek	Effective											
RS2-05	Community	Community concern during application process (eg health concerns, noise, dust at Stirling North airstrip)	Noise, airborne particulate	Community residents	Adverse media / PR / Political	Community relations	3. Moderate	C. Likely	High 11	Early community engagement and provision of information	Effective	4. Minor	D. Possible	Low 20	Further community and media engagement activities as required.	Flinders						
										Regulator intervention	Selection of environmentally safe and non-toxic dust suppressant - Vital Bon-Matt Stonewall	Effective										
										Risk review conducted by SA EPA	Effective											
										Spray from banks using a watercart to seal outer margin and prevent the risk of overspray from cropduster	Effective											
										Block polishing pond outlet to Hospital Creek	Effective											
										Stakeholder notification prior to activity - SAPOL, MFS, CFS, PACC, SA Water	Effective											
										Dust control at Stirling North airstrip (eg water cart)	Effective											
										Establish operating times protocol for aircraft	Effective											
RS2-06	Environment	Patchy application of suppressant leads to ineffective seal and risk of ash dust migration	Off-site migration by strong winds	Member of the public	Adverse health impacts caused by particulate exposure	Compliance	3. Moderate	D. Possible	Medium 16	Increased strength of application - Vital Bon-Matt Stonewall	Effective	3. Moderate	E. Unlikely	Low 21	Use of green pigment for visual assessment of application success	Flinders						
										Surrounding environment	General nuisance	Monitoring conducted by visual and real-time dust monitoring adjacent to ash dam	Effective									
										Alliance workforce	Adverse media / PR / Political	Re-application if required. PM10 data to be used to inform decision-making. Triggers to be established in consultation with EPA.	Effective									
											Breach of licence conditions	Technical support by Vital Chemicals to assess the success of the application, and need for re-application in areas as required.	Effective									

ASH DAM INTERIM SEALING
AUGUSTA POWER STATIONS - 21st OCTOBER 2016

Risk Identification							Inherent Risk Rating			Residual Risk Rating					Proposed Mitigation of Risk Exposure / Improvement Actions			Target / Future Risk Rating		
ID	Category	Source	Pathway	Receptor	Potential Consequences	Exposure Type	Consequence	Likelihood	Rating & Priority	Current Approach or (Existing Controls)	Effectiveness	Consequence	Likelihood	Rating & Priority	Risk Reduction Treatment or Asset Improvement Strategic or Approved Action	Action Owner	Planned Completion Date	Consequence	Likelihood	Rating & Priority
RS2-07	Environment	Deterioration (via time, heat, storm event or wind erosion) of supressant leads to ineffective seal and risk of ash dust migration	Off-site migration by strong winds	Member of the public	Adverse health impacts caused by particulate exposure	Compliance	3. Moderate	D. Possible	Medium 16	Increased strength of application - Vital Bon-Matt Stonewall	Effective	3. Moderate	E. Unlikely	Low 21						
				Surrounding environment	General nuisance					Monitoring conducted by visual and real-time dust monitoring adjacent to ash dam	Effective									
				Alliance workforce	Adverse media / PR / Political					Re-application if required	Effective									
					Breach of licence conditions					Accelerate long-term rehabilitation plans as required	Effective									
RS2-08	Environment	Storm event causes deterioration of supressant leads to ineffective seal and risk of ash dust migration	Off-site migration by strong winds	Member of the public	Adverse health impacts caused by particulate exposure	Compliance	3. Moderate	D. Possible	Medium 16	Increased strength of application - Vital Bon-Matt Stonewall	Effective	3. Moderate	E. Unlikely	Low 21						
				Surrounding environment	General nuisance					Monitoring conducted by visual and real-time dust monitoring adjacent to ash dam	Effective									
				Alliance workforce	Adverse media / PR / Political					Re-application if required	Effective									
					Breach of licence conditions					Review is areas require smoothing off prior to application to prevent rilling/gulying	Marginal									
									Accelerate long-term rehabilitation plans as required	Effective										