

SOUTH COOGEE NOISE AND DUST MANAGEMENT PLAN

On behalf of :

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE

Prepared by:

ENV Australia

A.C.N. 091 839 520

Mezzanine Level, Central Park

152-158 St Georges Terrace

Perth WA 6000

Telephone (08) 9322 2366 Facsimile (08) 9322 4251

01.081 RP001 FINAL FEBRUARY 2002



TABLE OF CONTENTS

1.	INTRODUCTION.....	1
2.	BACKGROUND.....	2
2.1	OVERVIEW	2
2.1.1	Dust	2
2.1.2	Noise and Vibration	2
2.2	POTENTIAL CONTAMINANTS WITHIN WASTE FILL.....	3
2.3	LOCATION AND SURROUNDING USES.....	3
3.	DUST MONITORING.....	4
3.1	OVERVIEW	4
3.2	DUST MANAGEMENT OBJECTIVE.....	4
3.3	AIR QUALITY ZONES	4
3.4	FINE PARTICULATES.....	5
3.4.1	Monitoring Program	5
3.4.2	Air Quality Standards.....	5
3.5	CONTAMINATED DUST.....	7
3.5.1	Monitoring Program	7
3.5.2	Air Quality Standards.....	7
3.6	NUISANCE DUST	9
3.7	CONTINGENCY RESPONSE.....	9

4.	DUST MANAGEMENT.....	10
4.1	OVERVIEW	10
4.2	DUST MANAGEMENT - REMEDIATION PHASE.....	10
5.	NOISE	12
5.1	NOISE MONITORING	12
6.	NOISE MANAGEMENT.....	13
6.1	OVERVIEW	13
6.2	VIBRATION MANAGEMENT	13
7.	COMMITMENTS	14
8.	REFERENCES.....	15

APPENDICES

APPENDIX A DETERMINATION OF SITE CLASSIFICATION

DISCLAIMER

This document is published in accordance with and subject to an agreement between ENV.Australia Pty Ltd (“ENV”) and the client for whom it has been prepared “Department for Planning and Infrastructure”. It is confined to the issues that have been raised by the client in the client’s engagement of ENV and prepared using the standard of skill and due care ordinarily exercised by Environmental Scientists in preparing such Documents.

Any person or organisation who relies on or uses the document for reasons or purposes other than those agreed by ENV and the Client without first obtaining written approval of ENV prior, does so entirely at their own risk and ENV denies all liability in tort, contract or otherwise for any loss, damage or injury of any kind whatsoever (whether in negligence or otherwise) that may be suffered as a result of relying on this Document for any purpose other than that agreed with the Client.

1. INTRODUCTION

This document is part of an overall environmental management program that is designed to fulfill environmental conditions for the project area set by the Environmental Protection Authority (EPA) after formal assessment. The document has been prepared specifically to fulfill Environmental Condition 4-1, points 10 to 17, by detailing the procedures and to manage noise and dust emissions during the remediation phase.

The objective of the Environmental Conditions and therefore this management plan is to ensure that nuisance and contaminated dust, and noise emissions, associated with the remedial works, comply with regulatory guidelines for the protection of human health and well being.

2. BACKGROUND

2.1 OVERVIEW

The Proponent recognises the need to control dust and noise emissions during the remediation phase in order to maintain the health and well being of people who are involved in the remedial works and those that work and live in areas adjacent to the site. The site is at least 500m from the nearest residents and thus the potential to impact on these residents is very low.

2.1.1 Dust

The potential sources of dust generation are earthmoving activities associated with the excavation and handling of contaminated soil. Special efforts are required to minimise the generation of dust emissions due to the presence of contamination.

Dust is generated when there is sufficient wind velocity and frequency to lift fine soil particles from the ground surface. The susceptibility of the soil to lift is a function of the presence of any ground cover, compaction and the moisture content of the soil. Dust is measured as Total Suspended Particles or TSP, which refers to particles that can remain suspended in the atmosphere but are not necessarily inhaled into the lung.

Soil particles greater than 75 microns (μm) are unlikely to become airborne. As such it is those contaminants that are contained within the $<75 \mu\text{m}$ soil fraction that represent a potential hazardous dust emission, as they could be inhaled.

2.1.2 Noise and Vibration

Earthmoving equipment has the potential to cause nuisance noise, especially if large numbers of machinery are used that are in poor operating condition (ie noisy mufflers). Therefore the earthmoving activities associated with the excavation of contaminated waste has the potential to create a social disturbance as a result of the generation of nuisance noise.

Noise will be generated from vibrating machinery, the lateral movement of trucks, the operation of front end loaders and vehicle reversing alarms. However the potential for nuisance noise is considered low due to the absence of residences, the isolated industrial nature of the area and the relatively small number of earthmoving machinery likely to be used. Nevertheless noise management measures will be employed to ensure that nuisance noise does not arise.

Vibration can be a result of earthmoving activities, which if excessive can cause damage to nearby buildings and structures. However due to the isolated nature of the site and absence of building structures, vibration is not considered to be an issue but will still be actively managed to minimise any impact.

2.2 POTENTIAL CONTAMINANTS WITHIN WASTE FILL

The waste material has been found to contain a range of heavy metals with hydrocarbons and organochloride pesticides also present. The heavy metals include As, Ba, Cd Cr, Cu, Mn, Ni, Pb, Hg, Zn and F. In addition to the contaminants, fine particulates in themselves represent a potential health risk. This applies to very fine particles less than 10µm in size, known as PM₁₀.

2.3 LOCATION AND SURROUNDING USES

The project area is enclosed within an industrial setting, with the nearest resident 500 m from the remedial works. The Project area is bounded by:

- the ocean to the west;
- vacant land rising up a hill to the east;
- vacant land to the south; and
- vacant land, parks and an industrial area to the north.

3. DUST MONITORING

3.1 OVERVIEW

This section describes the monitoring program and rationale that will be followed by the Proponent to ensure that the removal, handling and transport of the contaminated material does not result in dust levels that exceed criteria set for the protection of human health and well being.

3.2 DUST MANAGEMENT OBJECTIVE

The objective of the dust monitoring program is to prevent the exposure of remediation workers, the public and occupants of nearby properties to possibly harmful levels of airborne contaminants.

The purpose of dust monitoring is to confirm that personnel have not been exposed to potentially hazardous levels of contaminants rather than as a control mechanism on the level of dust management applied. As such, keeping dust emissions to a minimum is the aim of the dust management program rather than simply complying with air quality criteria.

3.3 AIR QUALITY ZONES

An exclusion zone will be established around the areas undergoing active remediation to prevent unprotected personnel coming into contact with potentially hazardous levels of airborne contaminants. The remainder of the site outside of the immediate remedial works will be subject to air quality suitable for occupational exposure. At the site boundary with other users, the air quality will need to comply with standards set for the protection of public health.

Air quality within the exclusion zone will be monitored inside sealed machinery cabins (earthmoving and trucks) where personnel are not wearing respirators. It will not be necessary to monitor outdoor air quality as all persons working within the zone outside will be required to wear the appropriate protective equipment.

Air quality immediately outside of the exclusion zone will be monitored to ensure compliance with occupational standards.

Air quality outside of the site boundary will be monitored to ensure compliance with standards set for the protection of public health.

To ensure monitoring is always undertaken downwind of the earthworks, a wind vane and anemometer will be located at the site office. This will enable the mobile air monitoring stations to be located correctly in relation to wind direction and strength.

3.4 FINE PARTICULATES

3.4.1 Monitoring Program

Fine particulate monitoring is the primary measurement for monitoring the performance of the dust management program as an instantaneous result can be provided while the other contaminants will require laboratory testing.

Fine particulates will be monitored using a portable PM₁₀ Aerosol Monitor. These are highly mobile and provide real time instantaneous results that can show compliance to the air quality criteria.

On-site monitoring will be undertaken during periods of active earthmoving at regular hourly intervals on the hour commencing at the beginning of the work day and finishing at the end of each work day. Each monitoring period will be for a duration of no more than 5 minutes so that short term peak emissions can be captured. The monitoring frequency will be increased if site conditions and activities are causing or have the potential to increase dust emissions (ie increasing wind strength or change in wind direction).

Monitoring will be undertaken at two locations both immediately upwind and downwind of the exclusion zone and at the site of active excavation.

Fine particulate monitoring for public exposure will be undertaken on the closest public area downwind, using a portable monitor. This will be undertaken at the same frequency as the on-site monitoring, on the hour every hour during periods of active earthmoving.

All monitoring results are to be maintained on a logging sheet for reference and proof of compliance to the air quality standards. All test results shall be assessed against the relevant standards as outlined in Section 3.4.2.

3.4.2 Air Quality Standards

Personnel working outside, within the exclusion zone, will be protected from exposure to fine particulates through the use of the appropriate protective equipment. Machinery cabins will need to be sealed and air conditioned with no venting from outside.

The occupational standard for exposure to fine particulates at the boundary of the exclusion zone is based on the respective time weighted average (TWA) exposure standard of 5,000 ug/m³ measured over an 8 hour work period which can include short periods of high dust levels. There are no short term exposure limits (STEL's).

The standard to be applied during the remediation works will be assessed using the instantaneous readings as opposed to the TWA, resulting in a more stringent application of the standard. Therefore the action level for modifying dust management practices will remain as 5,000 ug/m³ measure on-site rather than being reduced (due to exclusion of averaging factor associated with use of the TWA).

Instantaneous levels in excess of two times the standard (10,000 ug/m³) for more than 5 minutes will result in stoppage of all remedial work until corrective action improves air quality to below the 5,000 ug/m³ limit.

In terms of protecting public health at the nearest public space, the acceptable background level at the site boundary will be derived from the *National Environmental Protection Measure (NEPM) for ambient air quality, 1998*. This standard represents a longer term goal for ambient air quality “that allows for the adequate protection of human health and well being”. This applies to an air shed rather than localised sources of air emissions.

The NEPM specifies an ambient air quality target of 50 ug/m³. Given that the remedial works are a short term event, the proposed fine particulate air quality criteria for protecting the public is set at one order of magnitude above the NEPM at 500 ug/m³ which is still an order of magnitude below the occupational standard.

Off-site concentrations in excess of the 500 ug/m³ criteria but which are still below 1,000 ug/m³ will require improvement to the dust management practices in order to keep levels to a minimum.

Off-site concentrations in excess of the 1,000 ug/m³ will result in stoppage of all remedial work until corrective action improves air quality.

TABLE 1 - Fine Particulates Air Quality Criteria

LOCATION	TARGET CRITERIA ug/m ³	CORRECTIVE ACTION RESPONSE LEVEL ug/m ³	WORK STOPPAGE ug/m ³
Exclusion zone boundary	<5,000	5,000	10,000
Nearest resident (off-site)	<50 or background, whichever is the higher	500	1,000

3.5 CONTAMINATED DUST

3.5.1 Monitoring Program

Potential exposure to airborne contamination is a function of the amount of dust that can be generated. Thus by minimising dust emissions in general, airborne concentrations of contaminated particulates are also minimised.

Contaminated particulate monitoring will apply only at the initial stages of the remedial works to confirm that dust minimisation practices result in negligible contaminant air emissions. The majority of contamination on the site with levels above health based criteria are chromium, copper and lead, these will therefore be monitored.

Occupational monitoring of metal particulates will be performed for the first 5 days using portable personal air samplers on the downwind boundary of the exclusion zone. A sampler will be in place along the exclusion zone boundary at the site of active excavation.

The personal air samplers are to be used in accordance with occupational testing procedures and will be undertaken for no less than 4 hours duration each. The air samplers are to be provided to the laboratory at the end of the day to enable a quick turnaround in results (2 days) and prompt response to management practices if required.

Metal particulate monitoring for public exposure will be undertaken continuously for the first 5 days of the remediation phase with a permanent monitoring station at the boundary of the project area with public access in the most frequent wind direction. Samples will be collected using a high volume air sampler run over a 24 hour period with the filter papers changed at the end of each working day at approximately 6 PM. The filter papers are to be provided to the laboratory on the same day to enable a quick turnaround in results and prompt response to dust issues if required.

All monitoring results are to be maintained on a logging sheet for reference and proof of compliance to the air quality standards. All test results shall be assessed against the relevant standards as outlined in Section 3.5.2.

3.5.2 Air Quality Standards

Personnel working outside within the exclusion zone will be protected from exposure to heavy metal particulates through the use of the appropriate protective equipment. Machinery cabins will need to be sealed and air conditioned with no venting from outside.

The occupational standard for exposure to metal particulates at the boundary of the exclusion zone is based on the respective TWA exposure standards measured over an 8 hour work period which can include short periods of high dust levels. There are no STEL's

The action level for modifying dust management practices will be the 8 hour TWA. Levels in excess of two times the TWA standard or the STEL if applicable, will result in stoppage of all remedial work until corrective action improves air quality.

In terms of protecting public health, the acceptable background level at the site boundary will be derived from the NEPM if applicable.

The NEPM specifies an ambient air quality target of 0.5 ug/m³ for the contaminant lead only, and is an annual average value, with no air quality goals for the other metals.

Given that the remedial works are a short term event (2-3 months), the proposed heavy metal particulate air quality criteria for protecting the public is set at one order of magnitude below the occupational standard.

Off-site concentrations in excess of the proposed off-site criteria but which are still below the occupational limit will require improvement to the dust management practices in order to keep levels to a minimum.

Off-site concentrations in excess of the relevant occupational limit will result in stoppage of all remedial work until corrective action improves air quality.

TABLE 2 - Heavy Metal Particulates Air Quality Criteria

LOCATION	TARGET CRITERIA ug/m ³	CORRECTIVE ACTION RESPONSE LEVEL ug/m ³	WORK STOPPAGE ug/m ³
Exclusion zone boundary			
Chromium dust	<500	500	1,000
Copper dust	<1,000	1,000	2,000
Lead dust	<150	150	300
Nearest Public Location (off-site)			
Chromium dust	<50	50	500
Copper dust	<100	100	1,000
Lead dust	<15	15	150

3.6 NUISANCE DUST

Nuisance dust as distinct from contaminated or fine particulates (PM₁₀) will be monitored by visual observation performed by the remediation contractor on an hourly basis on the hour during periods of earthmoving activity. All monitoring is to be maintained on a logging sheet for reference and proof of compliance.

The visible monitoring of dust will be in accordance with the Department of Environmental Protection Land Development Sites and Impacts on Air Quality, *A Guideline for the Prevention of Dust and Smoke Pollution from Land Development Sites in Western Australia*, 1996. These guidelines specify that “visible dust crossing the site boundary indicates that the potential for adverse dust impacts exist and control measures should be implemented”. Evidence of no visible dust crossing the site boundary will be used as the monitoring criteria for compliance.

3.7 CONTINGENCY RESPONSE

In response to public complaints, advisory notices will be distributed to adjoining landowners within 48 hours upon the request of the DEP or the City of Cockburn. The advisory notes will detail the management response to addressing nuisance dust emissions and provide contact details.

Upon receipt of written complaints, nuisance dust monitoring will be undertaken upon the advice of the requirements of the DEP.

Dust management practices will be immediately reviewed and corrective action taken if required following formal advice from the DEP. If weather conditions are very windy and dust is clearly visible and moving off-site, watering will commence and remedial activities will cease until improvements are made to dust management practices or adverse weather conditions clear.

4. DUST MANAGEMENT

4.1 OVERVIEW

This section describes the measures that will be employed by the remediation contractor to minimise dust emissions generated as a result of earthmoving activities. The objective is to ensure that both on-site and off-site airborne contaminant concentrations comply with the relevant health protection criteria.

4.2 DUST MANAGEMENT - REMEDIATION PHASE

Dust management will comprise wind fencing, surface stabilisation and the use of dust suppressors in the form of water trucks and sprinklers. These will be made available for the entire remediation phase.

Watering will be conducted using water trucks and sprinklers at the following areas:

- sites undergoing excavations;
- on stockpiles; and
- on internal access tracks and machinery storage/parking areas.

All material which is to be removed is to be wetted down with a water truck prior to any ground disturbing activity. This will be performed every morning on days of activity. The quantity of water applied must be sufficient to penetrate and wet to a depth of 0.5 m as this represents the typical excavation depth.

Ground conditions are to be inspected during hot windy weather reducing in frequency in response to moderating weather conditions. This includes site entry and exit points, which will be swept down should a potential for dust generation from these locations eventuate.

Watering will occur at the following times:

- prior to the commencement of earthwork activities to ensure that the contaminated soil is sufficiently moist to prevent dust generation;
- as required based on prevailing weather conditions such as during strong winds; and
- at the end of each working day to minimise dust generation over night.

Water carts will be available with a total storage capacity of 10,000 litres per 7.5 hectares of disturbed site. Wind fencing of an appropriate length will be stored on site and will be erected when site conditions dictate their need or when instructed.

Comparison with the Site Classification Assessment Chart contained within the DEP's Land Development Sites and Impacts on Air Quality, shows that the site is a Classification 3 site (calculation shown in Appendix A). The provisions required by sites within this classification are shown below. All are included in this management plan.

Provisions

- Appropriate wind fencing or a length specified in the air quality management programme needs to be stored on site or available within one hour of being required by the engineer for the developer/local government/DEP.
- All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum to prevent exceedence of the maximum acceptable dust level (see section 6.).
- The engineer for the developer shall maintain close control of works with dust creating potential (for example, allowable of length of open trenching).
- After all siteworks are complete, and before the contractor has vacated the site, the developer should ensure that the entire site is stable. The developer then retains responsibility for site stability until change of ownership/control takes place. After the change of ownership/control has taken place, the new owner or controlling party will inherit responsibility for site stabilisation.

5. NOISE

5.1 NOISE MONITORING

Noise levels will be monitored to ensure that noise generated as a result of remediation activities does not create a social disturbance to occupiers of surrounding properties.

Monitoring at the site boundary will be undertaken by an experienced noise monitoring professional with a hand held noise monitor. Readings will be taken during periods of intense activity with a potential to generate high noise levels.

Monitoring of noise levels outside the site boundary will consist of:

- An up-to-date logbook of complaints and incidents will be maintained;
- An Environmental Incident Report Form and reporting process will be used for incident reporting; and
- Public complaints being documented and registered.

Acceptable noise levels will be in accordance with the 1997 Noise Regulations and Worksafe WA.

In the event of public complaints being received noise management controls may be implemented to address excessive noise levels.

6. NOISE MANAGEMENT

6.1 OVERVIEW

This section describes the measures that will be employed by the Proponent to minimise noise emissions generated as a result of earthmoving activities.

Noise levels will comply with DEP 1997 Noise Regulations, which consist of:

- adhering to the hours of normal operation, with work conducted between 7 am and 7 pm on any day which is not a Sunday or a public holiday;
- All plant equipment and vehicles being fitted with appropriate noise suppression equipment to reduce noise levels so far as is practicable, with machines the quietest reasonably available;
- All non-conformances and noise and vibration related complaints immediately reported to the Project Manager; and
- Following complaints the source of any excessive noise or vibration will be identified and, work practices modified or re-scheduled, to reduce or eliminate the risk of future events.

The potential for noise impact on residents is a function of the level of site activity and wind direction. During wind conditions which may enhance noise propagation towards residential areas, the magnitude of earthmoving activities maybe scaled down until such conditions change.

6.2 VIBRATION MANAGEMENT

Vibration is not expected to be an issue due to the distance to the nearest receptor and the level of activity planned. The proponent will comply with the Australian Standard AS 2670.2 – Evaluation of Human Exposure to Whole Body Vibration (1990).

7. COMMITMENTS

Department for Planning and Infrastructure (the proponent) makes the following specific commitments with regard to the management of nuisance dust, noise and vibration during the South Coogee remedial works:

1. The requirements of this Management Plan will be incorporated into the contractual arrangements and earthworks specification for the project.
2. Implementation of appropriate dust mitigation measures during the investigation, remediation and post-remediation phases in accordance with the DEP Land Development Sites and Impacts on Air Quality Guidelines, 1996, procedures for Classification 3 and 4 (for summer) sites.
3. Monitoring of dust and airborne contaminant emissions in accordance with the programme outlined in this Plan and if instructed by the Department of Environmental Protection or Health Department.
4. Manage noise levels in accordance with the Department of Environmental Protection 1997 Noise Regulations. Monitor noise levels upon complaint or instruction from the DEP.
5. Manage vibration in accordance with Australian Standard AS 2670.2 – Evaluation of Human Exposure to Whole Body Vibration (1990).
6. Cease earthmoving activities if dust generation is found to or considered likely to exceed the nominated criteria. Undertake corrective action prior to recommencement of activities.
7. Report on any exceedences of the acceptable dust and contaminant levels to the Department of Environmental Protection within 48 hours of the sampling event.

8. REFERENCES

AS, (1990). Australian Standard AS 2670.2 – Evaluation of Human Exposure to Whole Body Vibration.

DEP, (1996). Land development sites and impacts on air quality: A guideline for the prevention of dust and smoke from land development sites in Western Australia. Department of Environmental Protection.

DEP, (1997). Environmental Protection (Noise) Regulations. Department of Environmental Protection.

APPENDIX A

DETERMINATION OF SITE CLASSIFICATION

Part A. Nature of site

Item	Score option	Score
Nuisance potential of soil when disturbed	medium	4
Topography and protection provided by undisturbed vegetation	medium screening	6
Area of site disturbed by works	Between 5 and 10 ha	6
Type of work being done	Bulk earthworks and deep trenches	9
Total		25

Part B. Proximity of site to other land uses

Item	Score option	Score
Distance of other land uses from site	less than 100 m	18
Effect of prevailing winds (at time of construction) on other land uses	Isolated land uses affected by one wind direction	6
Total		24

SITE CLASSIFICATION SCORE 600