Bowman & Associates Pty Ltd

Environmental Engineering Consultants
Waste Management Specialists

Tel: (08) 9414 9670

www.bowmanassociates.com.au

Suite 8/640 Beeliar Drive, SUCCESS WA 6164
PO Box 2059, ROSSMOYNE WA 6148

RCG Pty Ltd

DUST MANAGEMENT PLAN QUINNS QUARRY ON LOT 11533 HESTER AVENUE, NEERABUP

This management plan describes the dust management measure in place at Quinn's Quarry, Neerabup, WA 6165.

DISCLAIMER

In order to provide structure to the conclusions derived in this document certain assumptions have been made. These assumptions are based on the Consultant's informal enquiries, knowledge and experience from working in the waste management industry.

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DOCUMENT CONTROL

VERSION	DATE RELEASED	PREPARED BY	APPROVED BY	AUTHORISED SIGNATURE
Draft V1	02.09.2014	Paul Antony	[redacted]	
Draft V2	26.11.2014	Paul Antony		

DOCUMENT DISTRIBUTION

VERSION	TYPE	FORMAT	ISSUED TO	ORGANISATION
Draft V1	Electronic	pdf	[redacted]	RCG Pty Ltd
Draft V1	Electronic	pdf	[redacted]	Department of Mines
Draft V2	Electronic	pdf	[redacted]	RCG Pty Ltd

FILE NAME

141126 PA RCG Pty Ltd Dust Management Plan.docx

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1 BACKGROUND

In 1996 RCG Pty Ltd (Proponent) commenced receiving inert material for landfill to bring the quarry void back to original ground levels. The quarry was subsequently licenced as a Prescribed Premises within Schedule 1 of the *Environmental Protection Regulation 1987* under the below three categories:

- **Category 70: Screening of Material –** premises on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated,
- **Category 62: Solid Waste Depot** – premises on which waste is stored, or sorted, pending final disposal or reuse,
- **Category 63: Class I Inert Landfill Site** - premises on which waste (as determined by reference to the waste types set out in the document entitled "*Landfill Waste Classification and Waste Definitions 1996*" published by the Chief Executive Officer and as amended from time to time) is accepted for burial.

The quarry continues limestone mining operations as well as operating as an inert landfill. At present Construction & Demolition (C&D) waste meeting Category 63 is directed to the inert landfill for disposal.

The Proponent engaged SLR Consulting on 18 April 2012 to the existing dust suppression measures and dust management procedures implemented to ensure dust impacts are not realised at nearby sensitive receptors locations. The Dust Management Plan has adopted additional measures proposed by SLR Consulting and the report from SLR Consulting is attached as **Appendix A**.

1.1 LOCATION OF SENSITIVE RECEPTORS

The nearest residential subdivision is approximately 160 m from the western boundary of the Lot (**Figure 1**). An easement for the proposed extension of the Mitchell Freeway and the Perth Metro train line are located between the residential subdivision and the western boundary of the Lot.

Figure 1: Site Location and Buffer Distances to Nearest Sensitive Receptors

2 KEY CHARACTERISTICS

The key characteristics of the facility are listed below.

Element	Description
Life of project	- Continual operation for next 20 years
Office Hours	- 6.00 am to 5.00 pm Monday to Thursday - 6.00 am to 4.00 pm Friday and Saturday - Landfill open between 8.00 am to 3.30 pm on Sundays - Closed on Public Holidays
Crusher Operating Hours	- 7.00 am to 3.00 pm Monday to Friday
Site Security	- Boundary fencing and lockable gates
Plant	- Mobile crushing and screening plant - Front end loaders x 2 - 30 tonne excavator x 1 - Landfill compactor x 1 - Water Trucks x 2
Topography of Site	- The crushing and screening operations are carried at least 17 m below natural ground level.

3 DUST MANAGEMENT

Dust emissions may arise during traffic on internal unsealed roads, loading and unloading of materials, operation of heavy equipment and windblown dust due to the exposed surfaces such as material stockpiles, unsealed road and loose top soil. The magnitude of impact will depend on the size of the operation, topography, adjacent land use, prevailing wind speed and direction, and distance to the nearest sensitive receptor. The objective of the dust management plan is to prevent generation of airborne particulates (including dust) to ensure no visible dust is discharged beyond the premises boundary.

The Proponent shall undertake below described dust control measures.

3.1 DUST MINIMISATION MEASURES

The generation of dust shall be minimised by:

- Where possible activities that have a high potential for dust generation such as extraction or crushing shall be halted during adverse weather conditions where winds are blowing towards the nearby receptors to the west,
- Trucks delivering material to the site shall have their loads covered,
- Trucks hauling the processed materials shall be adequately covered prior to leaving the site,
- Maintaining minimum length of excavated or processed stockpile towards the prominent wind direction by appropriate orientation of the stockpile,
- Maintaining minimum length of active tipping face at the landfill,
- Progressively rehabilitate excavated and landfill areas with revegetation as per approved Rehabilitation Plan for the site,
- Restricting traffic to most direct route on the site and prohibiting traffic on non-active areas,
- Limiting the speed on haul roads to below 40 km/h and 20 km/h on other areas,
- Reducing dump heights to a maximum of 5 m wherever possible,
- Wetting any dry loads prior to tipping as required,
- Undertaking scheduled maintenance of unsealed roads,
- Proactive monitoring of visible dust crossing the premises boundary and ensuring dust is contained within the premises boundary,
- Dust emissions shall be notified to the office staff by plant operators and site users,
- Routine maintenance and housekeeping practices to minimise accumulation of litter in and around the premises,
- Maintaining plant and equipment in appropriate manner as per manufacturer's recommendations,
- Instruction shall be given to all staff on dust minimising measures to be adopted,
- The private access road and unsealed area on the premises shall be watered as required to minimise dust, and
- Displaying office contact phone number at the entrance to report any dust concerns.

3.2 DUST SUPPRESSION MEASURES DURING OPERATION

The dust generated shall be suppressed by:

- Using water truck for wetting down during extraction, loading, unloading, crushing, screening, stockpile preparation and landfill operations,
- Watering down exposed stockpiles or delivered materials as required to prevent dust generation,
- A 10,000 L water truck shall be maintained on site to ensure adequate wetting down at required locations,
- The crushing plant is fitted with spray nozzles within the hopper to dampen material prior to crushing activities and at the end of the discharge belt to avoid wind-blown dust during feed to the screening plant. Dust covers are also used on the discharge conveyer,
- The screening plant has spray nozzles fitted at the end of the discharge belt to dampen the materials produced,
- Increasing the frequency of wetting down work areas using the water truck when need arises.
- During windy conditions halting dust generation activities temporarily until weather conditions become favourable, especially where winds are blowing in the direction of nearby sensitive receptors
- Use of chemical dust suppressants to be considered for use to bind surfaces exposed to traffic or wind, and
- Promptly acting on any dust complaints, recording in the register (**Appendix B**) and retaining the record together with the assessment of dust source and measures undertaken to mitigate the dust impact.

These management strategies shall enable the facility to operate efficiently with minimum dust generation.

3.3 DUST SUPPRESSION ASSETS

The following assets shall be used for dust suppression:

- Water from 75 mm pipeline connected to the main bore to dampen material during operation and storage at the crushing and stockpile areas,
- 10,000 L water truck to wet down haul roads, exposed areas and stockpiles as required,
- Water cannons to wet down the stockpile material in order to saturate the raw material prior to processing, and
- Spray units on crushing and screening plants.

Excessive dust could also have an impact on staff at the site. In accordance with the Department of Commerce, Western Australia's *Occupational Safety and Health Act 1984*, authorised staff shall have access to appropriate dust masks for use if required and be instructed in the use of dust suppression equipment.

3.3.1 Frequency for Implementing Dust Suppression Measures

The frequency for conducting dust suppression measures is listed in **Table 1**. The frequency shall be reviewed based on extent of impact by dust generation.

Table 1: Frequency for Dust Suppression

SUPPRESSION MEASURE	FREQUENCY
Wetting down fresh stockpiles after extraction, crushing and screening.	Twice during operating hours.
Wetting down of non-working faces of stockpiles.	Twice during operating hours.
Wetting down crushing and screening operations.	Continuously using the built in spray nozzles.
Watering of haul roads exposed to traffic movement.	Twice during operating hours.
Covering of loads.	Every truck entering and leaving the premises.

3.3.2 Frequency for Visual Monitoring Programme

The performance of the dust suppression measure shall be assessed by monitoring visible dust crossing the premises boundary. The list of monitoring measures for the assessing performance is listed in **Table 2.**

Table 2: Frequency and Responsible Staff for Dust Monitoring

PROGRAMME	FREQUENCY	RESPONSIBLE STAFF
Visual inspection of dust leaving the boundary of the premises.	Continuously during every operating day.	Site Supervisor Staff and Site Users
Visual inspection of dust generation on Liberty Drive and Hester Avenue.	Twice daily	Site Supervisor
Visual inspection of dust generation on haul road.	Continuously during every operating day.	Site Supervisor
Collection of litter in and around the premises.	Every second operating day.	Site Labour
Maintenance of Water Truck.	As required or in accordance with manufacturer recommendations.	Workshop Mechanic, Plant Operator and Site Supervisor
Maintenance of Plant.	As required or in accordance with manufacturer recommendations.	Workshop Mechanic, Plant Operator and Site Supervisor

3.4 OCCUPATIONAL HYGIENE DUST MONITORING

Occupational hygiene risk assessment for the staff at Quinns Quarry site was undertaken by Aurora Environmental in October 2014. The assessment was to address *Regulation 9.33(2) of the Mines Safety and Inspection Regulations 1995* which is to establish a dust monitoring program to include asbestos and undertake a risk assessment of the asbestos and any other dust on site.

The occupational hygiene risk assessment includes the estimated impact due to the proposed C&D recycling in addition to the current landfill operations. The proposed monitoring events (**Appendix C**) for occupational airborne dust will be followed by the Proponent after obtaining consent from the Department of Mines and Petroleum.

3.5 DUST ASSESSMENT OUTCOME

The location of the operation being at least 17 m below ground level shall prevent uncontrolled exposure of dust. The dust management regime for the operations and the Proponent's experience in operating this facility is envisaged to be sufficient to appropriately limit dust generation to be within the premise.

4 PROPONENT CONTACT DETAILS

[redacted]

Postal Address: PO Box 1333, SOUTH PERTH WA 6951

5 REFERENCES

Dust Suppression and Management Crushing Operations Quinn's Quarry, Neerabup, SLR Consulting Australia Pty Ltd, Lane Cove, New South Wales

Extractive Industries (Amendment) Local Law 2008, City of Wanneroo, Western Australia.

Landfill Waste Classification and Waste Definitions 1996 (As Amended), Department of Environment Western Australia.

Occupational Safety and Health Act 1984, Department of Commerce, Western Australia.

Schedule 1 of the Environmental Protection Regulation 1987, Environmental Protection Authority, Government of Western Australia.

6 APPENDICES

Appendix A

18 April 2012

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RCG Pty Ltd
PO Box 1333
South Perth WA 6951

[redacted]

[redacted]

Dust Suppression & Management
Crushing Operations
Quinns Quarry, Neerabup

Introduction

RCG Pty Ltd (RCG) are seeking to obtain a Category 13 Crushing of (Construction and Demolition) Materials Licence from the WA Department of Environment and Conservation (DEC) to enable the crushing of concrete and bricks through a crushing plant located at Quinns Quarry on Hester Avenue, Neerabup WA.

As part of the above proposal, the DEC requires that a risk analysis of the possible discharges and emission of the proposed activity (i.e. crushing) be undertaken. RCG are also required to demonstrate the use of industry 'best practice' solutions in response to the proposed non-compliance to the EPA recommended separation distance (between crusher unit and sensitive land use) of 1,000 m. The DEC has also requested the provision of a Dust Management Plan.

SLR Consulting Pty Ltd (SLR Consulting) have been engaged by RCG to detail the dust suppression measures and dust management procedures that have been implemented to ensure dust impacts are not realised at nearby sensitive receptor locations.

Sensitive Receptor Locations

The closest sensitive receptors are located along Liberty Drive approximately 300 m to the west of the proposed crushing area and run parallel to site in a north northwest to southerly direction. A strip of bushland and a rail line lie between the site and the residential housing district to the west.

Sensitive receptor locations are also situated approximately 750 m to the northeast of the main operations area at Quinn's Quarry. A stretch of natural and rehabilitated bushland and Wanneroo Rd lie between the site and the northeastern receptors.

Proposed Operations

RCG are proposing to process in excess of 60,000 m^3 per annum of material using a Finlay Jaws Crusher (the Crusher) based on a trialled production rate of 200 m^3 per hour of processed crushed rubble and sand. Crusher operational hours are proposed for 7am to 3pm, Monday to Sunday.

A brief description of onsite material sorting and processing is provided below:

- Material received on site is separated and stockpiled as 'clean brick incoming', 'clean concrete incoming' and 'mixed waste'.
- Mixed waste is passed over a 300 mm grizzly feeder to separate non recyclable material from usable product using a Front End Loader (FEL). Waste material is compacted using a 42 tonne landfill compactor and used as landfill, while the recyclable material is stockpiled with the clean brick stockpile and processed by excavator.
- RCG strictly supervise the dumping of timber on site however due to certain non-conforming loads, skip bins are placed every 5 m so operators can stop and dispose of wooden pallets and cardboard etc. with full skips then taken to Tamala Park landfill for disposal.
- Material for crushing is loaded into the hopper bin of the crushing unit by excavator. Scrap metal is separated using an electro-magnet fitted above the discharge belt on the crusher and is dumped into a 9 m scrap metal bin (with bins replaced weekly by Laurence Scrap Metal).
- The crushed material is discharged from the crusher unit via a discharge belt into a screening plant for size screening. Screened material is then deposited to the ground via stockpiler units.

Associated Air Pollutant Emissions

The main emissions associated with on site processing activities include:

- Emissions of dust due to material dumping and processing, loading and unloading of material into the crusher hopper unit and bins by excavator and FEL, wind-blown dust due to exposed surfaces such as material stockpiles and haul roads and vehicle wheel-generated dust due to traffic on internal unsealed roads.
- Emissions associated with (diesel) fuel combustion including: Carbon Monoxide (CO), Oxides of Nitrogen (NO_x), Particulate Matter (PM_{10} & $PM_{2.5}$), Polycyclic Aromatic Hydrocarbons (PAHs), Sulphur Dioxide (SO_2) and Total Volatile Organic Compounds (TVOCs).

It is envisaged that fuel combustion emissions will not lead to significant air quality impacts off-site.

The main potential for air quality impacts off-site will be wind-blown dust. Wind-blown dust will be managed appropriately through the adoption of dust suppression measures and the implementation of effective dust management procedures as detailed in the following sections.

Dust Suppression Measures

The following dust suppression measures are implemented on site:

- An 18,000 L water truck is utilised on site for wetting down haul roads and other unsealed trafficked areas. The truck requires refilling after every 30 minutes of use and takes approximately 10 minutes to refill.
- A 75 mm agricultural pipeline also runs from the main bore to the crushing and stockpile areas and is used to keep material sufficiently damp during the production and storage stages of the operations.
- Water cannons have been implemented to spray stockpiled material (yet to be crushed) and are operational 24 hrs-a-day in order to saturate the sand and soak the hard rubble so it is sufficiently dampened prior to processing.
- The crusher unit is fitted with spray nozzles which operate within the hopper bin to dampen material prior to crushing activities. The crusher has a dust cover on the discharge conveyer. Spray nozzles are also fitted at the base of the jaws on the end of the discharge belt to avoid wind-blown dust during discharge of crushed material to the screening plant.
- The screening plant has spray nozzles fitted at the end of the discharge belt which operate to dampen crushed material prior to being sized through the screen box.
- Stockpiler units have spray nozzles attached both at the feeder bin and on the conveyer belts, for use prior to material being deposited onto the ground.

- Recycled (coarse) product is used to line haul roads to reduce dust generation due to vehicular traffic.
- The recycled waste material tipping area is capped on a daily basis to minimise the potential for wind-blown waste from the area.

Dust suppression methods have been trialled by RCG in order to obtain the best process of dust avoidance during processing activities.

Dust Management Procedures

The dust management procedures that will be employed on site to effectively manage and minimise the impact of dust from on site operations on the environment and nearby residences are detailed below. An effective response mechanism for dealing with issues and complaints is also outlined.

To ensure dust impacts are not realised at off-site receptor locations, regular visual observations of wind speed and direction experienced on site should be made to identify conditions which would be unfavourable in terms of dust transport towards the west and northeast of the site.

In particular, crusher activities should be halted during adverse weather conditions (i.e. hot, dry, high wind conditions) where winds are blowing in the direction of nearby sensitive receptors as follows:

- during northeast to southeasterly winds, and particularly during strong (>5 m/s) easterly winds.
- during strong (>5 m/s) winds experienced from the west to southwest quadrants.

Appropriate operating conditions may be identified onsite through visual observation of a wind sock currently located onsite. Any dust plumes should also be actively monitored through regular visual inspection during the operation of dust generating onsite works and material processing activities. Where dust generation is observed, crushing operations will be ceased until more favourable meteorological conditions exist, or additional dust suppression measures can be implemented.

The following additional dust management procedures should also be implemented on site:

Source	Control Measures
Wind-Blown Dust Sources	
Material Stockpiles	• Maintaining the shape and orientation of stockpiles may assist in mitigating dust emissions. • Fencing, bunding or shelterbelts may also be used to reduce ambient wind speeds (in some areas).
Transportation (Trucks)	• Trucks and vehicles carrying loads that are entering and leaving the premises should be covered. • A drive-through wheel wash may be implemented to reduce trackout of mud onto public roads.
On-Site Activity-Generated Dust Sources	
Haul Road Dust	• Haulage vehicles should be restricted to the most direct route and minimal manoeuvring areas to prevent indiscriminate driving over non-active areas. • Haul roads should have designated speed limits (generally 40 km/h). Hard stand areas have a speed limit of 20 km/h. • Scheduled grading and gravelling of heavy traffic areas (i.e. intersections) should be undertaken. • The use of chemical dust suppressants may be employed where appropriate to reduce the potential for ambient dust emissions.
Loading and Dumping	• Dump heights should be minimised wherever possible (reduce to 5 m).
Plant and Equipment	• All plant and equipment installed on the site should be maintained and operated in a proper and efficient condition.

Source	Control Measures
Excessive Dust Events[1]	
Haul roads	• More frequent use of water truck to dampen haul roads and exposed areas.
Potential dust generating activities	• Temporary halting of activities and resuming when weather conditions have improved should be implemented.

Note 1: An excessive dust event includes prolonged visual dust in a particular area.

A complaints log should also be maintained on site as standard practice to detail any complaints reported directly to RCG. The complaints register should note the following details of a complaint relating to nuisance dust:

- Name and contact details of the complainant (where possible).
- Location where the nuisance dust was noted.
- Date and time that the complaint was made.
- Weather conditions experienced on the day (e.g. temperature, humidity, wind characteristics, clear or rainy).
- The perceived frequency and duration of the conditions giving rise to the complaint.
- The perceived (or assumed) source of the condition giving rise to the complaint.
- A description of the conditions and the effect upon the complainant.
- Site activities undertaken at the time of the complaint.

Closure

I trust the above letter meets with your immediate requirements. Please do not hesitate to contact me should you require any further information.

[redacted]
Senior Project Consultant

Appendix B Complaint Register

Complainant Contact Details	Impact Location	Date/Time of Complaint Notification	Impact on the Complainant	Prevailing Weather Conditions (temperature, wind, climate)	Perceived Frequency and Duration of the Conditions	Perceived Source of Dust and Activities at Particular Time	Mitigation Measures Undertaken

TABLE 4

REQUESTED QUOTA

Occupational Code	Sub Category	Occupations	Number of Employees in this Group	Contaminant	Current CONTAM Quota per Year	Proposed per Year	Proposed Quota per Quarter	Justification
1 General Management, Professional & Supervisory 3 Surface Mining Services	140Management /Admin Services 150 Mine Management 370 Open Cut Services	145 Clerical/Secretarial 149 Management/Admin Services 159 Mine Management NOC 376 Weighbridge Operator	4	RES	0	2	1-0-1-0	Exposure to respirable dust and silica is likely to be restricted to incidental exposure from traffic delivery through the weighbridge or visits to the quarry operation
				SIL	0	2	1-0-1-0	
				ASB	0	4	1-1-1-1	Exposure to asbestos fibre is likely to be restricted to incidental exposures as above.
						Total Samples Per Quarter	3-1-3-1	

Appendix C: Proposed Hygiene Dust Monitoring

CONTAM Quota Risk Assessment

Occupational Code	Sub Category	Occupations	Number of Employees in this Group	Contaminant	Current CONTAM Quota per Year	Proposed per Year	Proposed Quota per Quarter	Justification
3 Mining Production and Services (Surface)	340 Excavation Equipment Operator 350 Mobile Plant Operator 360 Driving Occupations	346 Hydraulic Excavator Operator 348 Front End Loader Operator 359 Mobile Plant Operator NOC (Compactor) 362 Water Truck Driver	3	INS	0	2	0-1-0-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
				RES	0	4	1-1-1-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
				SIL	0	4	1-1-1-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
				ASB	0	4	1-1-1-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
						Total Samples Per Quarter	3-4-3-4	

Occupational Code	Sub Category	Occupations	Number of Employees in this Group	Contaminant	Current CONTAM Quota per Year	Proposed per Year	Proposed Quota per Quarter	Justification
4 Ore Treatment Occupations	410 Processing Plant 420 Mobile Plant	413 Processing Plant Utility Worker (Sorters x 2) 421 Front End Loader Operator 422 Mobile Plant Operator NOC (Excavator)	4	INS	0	2	1-0-1-0	Possibility exists for exposure. Monitoring program required to characterise hazard.
				RES	0	4	1-1-1-1	Better characterised by mobile plant occupations. Monitoring program required to characterise hazard.
				SIL	0	4	1-1-1-1	Better characterised by mobile plant occupations. Monitoring program required to characterise hazard.
				DP	0	4	1-1-1-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
				ASB	0	2	0-1-0-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
						Total Samples Per Quarter	4-4-4-4	

Appendix C: Proposed Hygiene Dust Monitoring

CONTAM Quota Risk Assessment

Occupational Code	Sub Category	Occupations	Number of Employees in this Group	Contaminant	Current CONTAM Quota per Year	Proposed per Year	Proposed Quota per Quarter	Justification
3 Mining Services (Surface) 6 Metal Trades 7 Electrical Trades	360 Driving Occupations 630 Mechanical Fitter 710 Electrical Trades	369 Driver NOC (Skip Bins) 633 Diesel Fitter 714 Automotive Electrician 716 Air Conditioning Mechanic	On Call	RES	0	2	0-1-0-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
8 Miscellaneous Trades	830 Motor/Engine Trades 890 Utility Operator	832 Diesel Motor Mechanic (Hoses) 890 Utility Operator NOC (Rehabilitation Worker)		SIL	0	2	0-1-0-1	Possibility exists for exposure. Monitoring program required to characterise hazard.
						Total Samples Per Quarter	0-2-0-2	