

Appendix 5

Site Specific Procedure – Dust Control

(Total No. of pages including blank pages = 16)

Note: A complete colour version of this Appendix is available on the Project CD or from the DPE website



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Dust Management Plan

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1. INTRODUCTION

The Site Specific Procedure – Dust Control is aimed at providing detailed operational guidance specifically related to the management of dust that may be generated during pre-stripping, mining and processing activities. The procedure has been developed to ensure compliance with all statutory approvals and the site Air Quality and Greenhouse Gas Management Plan. The Air Quality and Greenhouse Gas Management Plan forms part of the overarching Environmental Management Strategy for the site.

2. AIM

It is acknowledged that works on site will generate a certain level of dust. It is essential that the dust be managed to ensure it does not cause an environmental nuisance to surrounding properties or a safety hazard to users of the Newell Highway, or employees and contractors working on site.

To manage these issues it is necessary to implement appropriate controls that take into consideration:

- the different work areas and activities across the mine,
- the various weather conditions that can be reasonably expected,
- the proximity of the work activity to Mine Lease boundary, adjacent dwellings and the Newell Highway.

3. LEGISLATIVE REQUIREMENTS

TGP was assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Condition 17 and 18 (Figure 1) of the Project Approval issued by the Department of Planning and Infrastructure prescribes the Air Quality Criteria for the project.

Environmental Protection Licence (EPL 20169) issued by the Environment Protection Authority also prescribes operation standards and exceedances limits for dust emissions. (Figure 20)

Figure 2: EPL conditions

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Figure 1: Project Approval Conditions

Air Quality Criteria

17. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria listed in Tables 5, 6 or 7 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 5: Long term impact assessment criteria for particulate matter

Pollutant	Averaging Period	^a Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 6: Short term impact assessment criterion for particulate matter

Pollutant	Averaging Period	^a Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 7: Long term impact assessment criteria for deposited dust

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^{a, d} 4 g/m ² /month

Notes to Tables 5-7:

- ^a Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);
- ^b Incremental impact (ie incremental increase in concentrations due to the project on its own);
- ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and
- ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.

Operating Conditions

18. The Proponent shall:

- implement best management practice, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions from the project;
- regularly assess the predictive meteorological forecasting data and real-time air quality monitoring data, and relocate, modify and/or stop operations on site to ensure compliance with the relevant conditions of this approval;
- minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see Note d to Tables 5-7);
- minimise any visible air pollution generated by the project; and
- take all practical measures to minimise dust emissions from the residue storage facility, to the satisfaction of the Director-General.

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Figure 2: EPL conditions

4 Operating Conditions

01 Activities must be carried out in a competent manner

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Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 20109

01.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

02 Maintenance of plant and equipment

02.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

03 Dust

03.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

03.2 All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance.

03.3 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

4. TARGETS

The table below details the objectives and targets with respect to dust emissions from the site.

Table 1: Objectives and Targets

Objectives	Target
Minimise dust nuisance to surrounding residents	Maintain recorded annual average Depositional Dust levels below the nuisance level of 4g/m2/month
No adverse health impacts a result of the project	PM10 levels remain lower than the national guideline of: 24-hour maximum of 50ug/m3, with 5 allowable exceedances per year.

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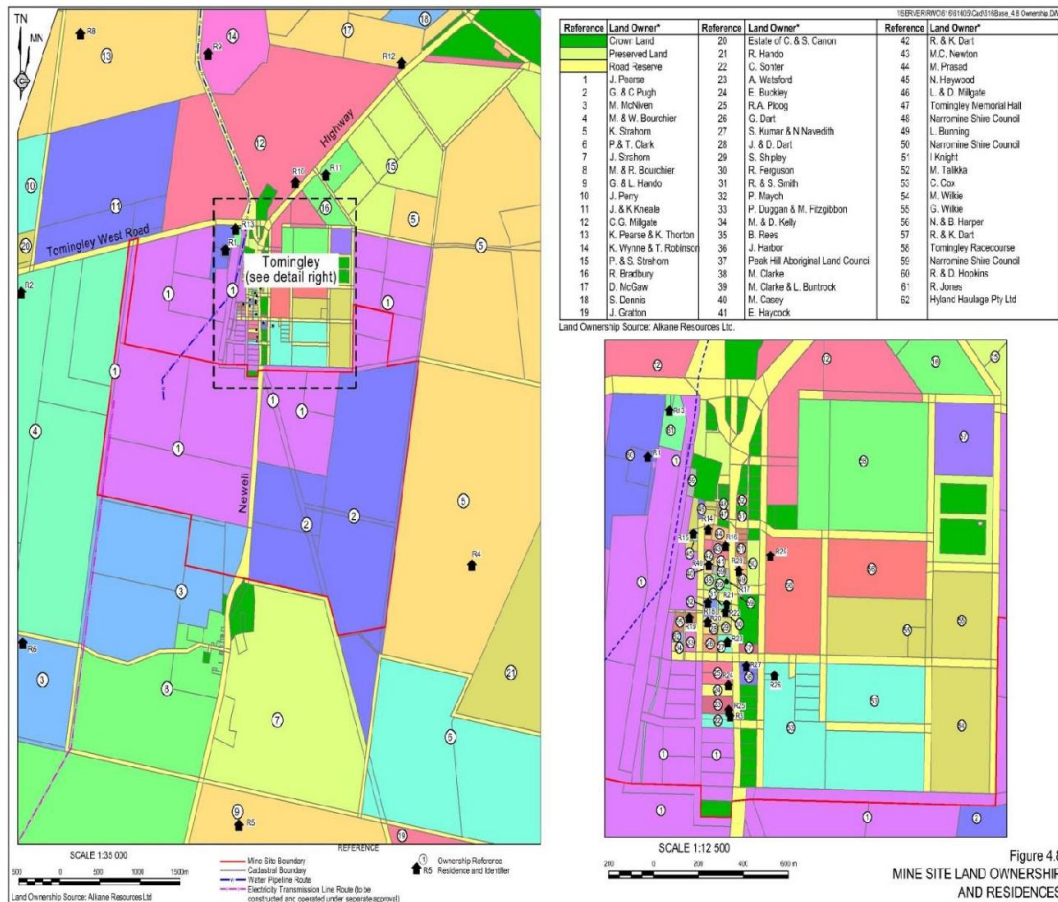
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5. EXISTING ENVIRONMENT

5.1 SURROUNDING RESIDENCES

The Figure 3 below shows the location of residences surrounding the TGP.

Figure 3: Proximity of adjoining dwellings



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5.2 POTENTIAL DUST SOURCES

The following activities have been identified as potentially resulting in emissions of particulate matter during dry conditions.

- Vegetation clearing and soil stripping.
- Blasting.
- Excavation of soil, waste rock and ore material and loading of that material into trucks.
- Unloading of material onto the ROM pad.
- Primary and secondary crushing of ore.
- Road and hardstand area construction.
- Wind erosion from disturbed areas.
- General movement of vehicles on unsealed roads within the mine site.
- Dust generated from land outside of the control of the mine.

5.3 PROJECT SITE WIND ENVIRONMENT

Figure 4 presents the annual and seasonal wind roses compiled from TAPM incorporating wind observations from the Peak Hill Gold Mine Meteorological Station for the period of 2003 (PAEHolmes 2011). This data may be summarised as follows;

- On an annual basis, the data show a high frequency of winds from the north-east, east and north-west directions. The annual mean wind speed for the Project is 1.8m/s and the percentage of calms (wind speed less than 0.5m/s) is 8.9%.
- In summer and autumn, the dominant winds are relatively strong winds from the east.
- In winter and spring, the dominant winds are relatively light winds from the north-east and north north-east.

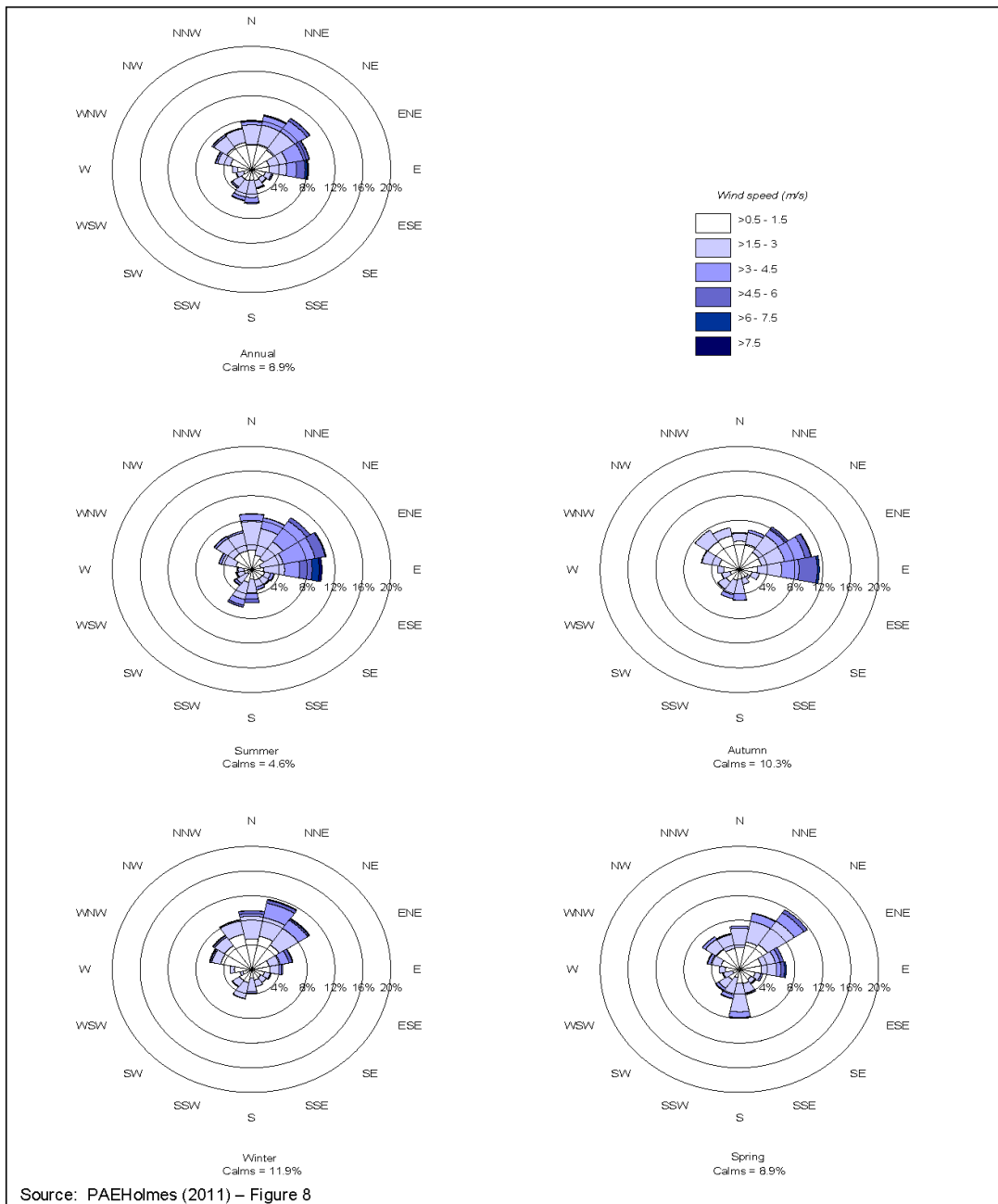
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Figure 4: Wind Roses indicating prevailing wind directions



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6. OPERATION CONTROL MEASURES

6.1 GENERAL CONTROLS

Whilst various work areas require specific controls given their location, the task being carried out and climatic conditions at the time, there are pre-emptive measures that can be implemented across the site.

Table 2 – Pre-emptive measures for dust control across site

Task/Activity	Pre-Emptive Control Measures and Actions
Induction	All TGO employees and contractors are to be informed of the need to minimise dust generation on site. All employees and contractors should be encouraged to report dust issues to their supervisor immediately so as to avoid the problem developing into a non-compliance issue.
Mine Planning	The local weather forecast is to be considered when programing all works. Alternate work areas and tasks are to be planned to provide a contingency for unfavourable weather conditions.
Weather conditions	Where it is identified that adverse weather conditions maybe experienced during the shift, the Mine Supervisor or Contractor Supervisor is to notify the crews at the Pre-shift Briefing and remind the crews to be vigilant in monitoring and reporting excessive dust. These adverse weather conditions may include: • Still conditions during the early morning and evening. These conditions may cause any dust that is generated to accumulate in the atmosphere above and around the site limiting visibility potentially causing a safety issue on site and for traffic on the Newell Highway. The accumulated dust can also cause an environmental nuisance for adjoining properties. It should be recognised that these conditions can take several hours (or longer) to rectify, hence the need to ensure still conditions are identified as early as possible. • Hot dry conditions during summer in excess of 35°C. Once temperatures reach above 35°C it is difficult to maintain adequate surface moisture to control dust generation. • Windy conditions, with wind speed above 32km/h. Strong winds not only have the potential transport vehicle generated dust off site but cause dust to blown from any disturbed areas.

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Visible Dust Monitoring and management	The Contractor Supervisor and Site Supervisor are to monitor dust on regular basis during dry conditions. Depending on the work area and prevailing wind conditions, visual monitoring is to include the Newell Highway and dwellings on the southern perimeter of Tomingley. Where the supervisor considers dust is leaving the site at an unacceptable level, the task causing the dust generation is to be suspended immediately and the Mine Superintendent (or delegate) is to be notified.
Water Cart Availability	In the circumstance where no water cart is available due to unplanned maintenance, water supply issues or the like, all activities that may generate dust are to be suspended immediately. The Contractor Supervisor or Mine Supervisor (depending on responsibility for activity) is to notify the Mine Superintendent immediately. In accordance with the EPL, works cannot re-commence until dust control measures are reinstated.
Water Application	Water application is to be carried out in so as not to cause unsafe slippery conditions. Water is a finite resource on site and water wastage is to be avoided. Report any leaks to the Contractor Supervisor or Mine Supervisor. Arrangements for repairs are to be made as quickly as possible.
Pre-watering prior to works commencing during dry conditions.	When it is evident that the road surface or work area may generate dust, the area that is to be utilised during the shift is to be watered prior to works commencing. This includes access roads, haul roads, go-line and work areas.
Watering during operations	The Contractor Supervisor and the Mine Supervisor are to ensure that adequate water cart capacity is maintained onsite at all times so as to ensure all operations and activities occurring at the premises are carried out in a manner that will minimise dust from the premises. When assessing what capacity is adequate, consideration must be given to the following: • Are works being carried out simultaneously on the eastern and western side of the Newell Highway? • Site water balance. • The task to be carried out (e.g. topsoil/subsoil stripping) • Location of the works • Weather and ground conditions. • The need to minimise dust in the processing, admin and site access areas.
End of Shift watering during dry conditions	So as to ensure adequate moisture is retained in the trafficable surface; access roads, haul roads and work areas that are to be utilised by the oncoming shift should be watered at the end of the outgoing shift. This is particularly important for the night shift.

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Scraper Operations	- The Contractor Supervisor must ensure that machines are of a size approved by TGO for use on site to maximise soil movements whilst minimise vehicle movements. - Whilst stripping topsoil and subsoil the Contractor Supervisor must ensure that the scraper bowl is not filled to a point where spillage causes dust generation. - The Contractor Supervisor is to ensure that the closure mechanism on the scraper bowl is maintained to within OEM standards so as to minimise soil leakage that may create dust during tramming. - During scraper operations in dry conditions, water carts are to be run at a ratio of one pass on the stockpile or access road per 2 scraper movements (unless conditions become slippery and unsafe)
Blasting	Appropriate controls will be included in the Blast Management Plan to minimise dust emissions from blasting, this may include pre-treatment of the blast area with dust suppression and the monitoring of wind direction prior to the blast being carried out to ensure the blast is carried when wind speed and direction is favourable.
ROM Pad Management	Due to its elevation, operations on the ROM pad have the potential to spread dust across the site. This elevation also makes the ROM pad visible from outside the site. During the unloading of ore onto the ROM pad, pushing up of stockpiles and loading of ore into the crusher, suitable arrangements are to made to minimise dust generation. This may include the use of water cart, dust suppression additives and/or fixed water spray systems.

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Personnel Health Management	Risk management principles are used by TGO to manage occupational health, with the aim of ensuring workers are not exposed to health hazards at levels likely to result in adverse health effects. This involves recognition, assessment and control of all potentially hazardous agents and factors that workers at TGO may be exposed to at work (e.g. chemicals, solvents, gases, airborne particulates, fibres, manual tasks, radiation, noise, vibration or extremes of temperature). Exposure monitoring will be conducted at TGO, dusts such as silica and other airborne dusts will be monitored using: - AS2895-2004 Workplace Atmospheres – Method for Sampling and Gravimetric Determination of Respirable Dust - AS3640 – 1989 Workplace Atmospheres – Method for Sampling TGO will implement the following to control generation of and limit worker exposure to dust: - watering of roads - proper ventilation of working places - wetting stockpiles when moving broken rock, loading trucks or dumping into bins or stockpiles; - use of clear water for sprays and mists; and - use of water sprays in crushing and screening plants - use of dust extraction and water injection on drill rigs - use of appropriate Personal Protective Equipment in conjunction with the above where required. - and Gravimetric Determination of Inspirable Dust.
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6.2 AREA SPECIFIC CONTROLS

As the site is divided by the Newell Highway which creates two separate work areas, it is necessary to put in place location specific control measures and actions based on wind direction, weather conditions and the particular task being carried.

Caloma	When the weather forecast indicates that: - the wind direction maybe from the South, South/East or East. - the temperature is to exceed 35°C - wind direction is to exceed 32km/h or the wind speed falls below 5km/h - conditions are dry Any planned works to occur on the Caloma Topsoil dumps should be rescheduled so as to avoid any concerns with dust impacting on the dwelling to the North of the site, Tomingley Village and the Newell Highway. Should weather conditions change un-expectantly during the day or night to the conditions listed above, Contractor Supervisor or Mine Supervisor is to review operations and contact the Mine Superintendent (or delegate) to notify of the change in weather conditions. Consideration should be given to relocating works to a location that will minimise the risk of unacceptable levels of dust leaving the site given the prevailing conditions.
Wyoming	When the weather forecast indicates that: - the wind direction maybe from the South, South/West or West. - the temperature is to exceed 35°C - wind direction is to exceed 32 km/h or the wind speed falls below 5km/h - conditions are dry Any planned works to occur on the Wyoming Waste Rock Emplacement 2 or Wyoming Topsoil dumps should be rescheduled so as to avoid any concerns with dust impacting on the Tomingley Village and the Newell Highway. Should weather conditions change un-expectantly during the day or night to the conditions listed above, the Contractor Supervisor or Mine Supervisor is to review operations and contact the Mine Superintendent (or delegate) to notify of the change in weather conditions. Consideration should be given to relocating works to a location that will minimise the risk of unacceptable levels of dust leaving the site given the prevailing conditions

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6.3 REACTIVE TRIGGERS

Where the routine visual inspections indicate unacceptable levels of dust are present and a possible non-compliance with the Project Approval or Environment Protection Licence conditions may occur, the following actions will be undertaken:

Visual Indicator System has been developed to assist in Managing the Trigger Action Response:

	Normal activities to proceed subject to pre-emptive measures being carried out.
	Hourly condition monitoring and operational review to be carried out.
	• Suspend operations causing dust generation. • Determine the activities that are most likely contributing to the non-compliance; • Review the process and current controls in place for these activities; and • Implement actions outlined in the pre-emptive Measures Table

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Trigger		Responsibility
Climate – - Temperature above 12°C and below 35°C - Wind speed above 5km/h and below 32km/h - Ground conditions are moist following rain		Mine Manager
Climate - - the temperature is to exceed 35°C - Night/morning temperature below 12 degrees - wind speed is to exceed 32km/h - or the wind speed falls below 5km/h - ground conditions are dry Wyoming – - The wind direction maybe from the South, South/West or West. Caloma – - The wind direction is blowing from the South, South/East or East.		Mine Manager
Water Cart not available (with the exception of shutdowns for routine maintenance)		Mine Manager
Contractor Supervisor or Mine Manager (or delegate) considers dust levels leaving the mine lease boundary are unacceptable.		Mine Manager
Contractor Supervisor or Mine Manager (or delegate) considers dust impacting upon the highway within the mine lease boundary may pose a safety hazard to motorists.		Mine Manager
Contractor Supervisor or Mine Manager (or delegate) considers dust accumulating in atmosphere on the mine site is causing unsafe conditions. E.g. poor visibility.		Mine Manager
Contractor Supervisor or Mine Manager (or delegate) identifies excessive dust generation from exposed material emplacement areas or other exposed areas.		Mine Manager

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7. COMPETENCE TRAINING AND AWARENESS

All personnel working on TGP will undergo a project induction. This induction includes information on the management of dust and air quality while working on site.

After completing the induction workers will sign a statement of attendance and records of this will be kept in the site office.

8. REVIEW

This procedure will be reviewed annually from the commencement of pre-stripping and mining activities or sooner should any deficiencies be identified. This will ensure the adequacy of the procedure and allow for opportunities for improvement.

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