



TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)

Tomingley Gold Project

Air Quality and Greenhouse Gas Management Plan



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TABLE OF REVISIONS

Revision Number	Revision Date	Prepared By	Approved by	Comments
Revision 1	November 2012	Francine Triffett Colleen Measday	Michael Sutherland	Submitted for Consultation
Revision 2	December 2012	Colleen Measday	Michael Sutherland	Submission for Approval
Revision 3	February 2015	Mark Williams	Sean Buxton	Annual review
Revision 4	April 2016	Judith Cox Li Fitzmaurice (Pacific Environment)	Mark Williams	Significant Update
Revision 5	July 2017	Mark Williams	Sean Buxton	Update following MOD 3 Approval

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1. INTRODUCTION AND SCOPE

The Air Quality and Greenhouse Gas Management Plan has been prepared to manage air quality and greenhouse gas related issues during the construction and operation of the Tomingley Gold Operations (TGO, or the Mine). It will be used by TGO personnel as the first point of reference for air quality and greenhouse gas related issues.

TGO will mine 51.6 million tonnes and process 6.5 million tonnes of gold bearing ore over a 9 year period. It will comprise of four open cut and one underground area of mining, a processing plant, three waste rock emplacements, a residue storage facility and associated civil infrastructure.

This plan has been prepared using the background information sourced from the Tomingley Gold Project Environmental Assessment (November 2011) and Tomingley Gold Mine Modification Assessment– Air Quality (November 2015), and has been prepared in conjunction with specialist consultants of Pacific Environment (formerly, PAEHolmes).

The Air Quality and Greenhouse Gas Management Plan sits under the overarching Environmental Management Strategy for the project and with the other Environmental Management Plans, forms the basis for environmental management at TGO. The other Environmental Management Plans include:

- Noise Management Plan;
- Blast Management Plan;
- Biodiversity Management Plan;
- Cultural Heritage Management Plan;
- Traffic Management Plan;
- Rehabilitation Management Plan;
- Hazardous Materials Management Plan and
- Water Management Plan.

2. BACKGROUND

Pacific Environment (formerly PAEHolmes) were engaged in 2011 to model and predict the impact on air quality and the contribution to greenhouse gas as a result of construction and mining operations associated with TGO.

Dispersion modelling was used to determine the impact that dust emissions from the Project would have on local air quality. The modelling investigated the maximum 24-hour PM₁₀, annual average PM₁₀, annual average Total Suspended Particles, (TSP) and annual average depositional dust (insoluble solids) from TGO alone as well as for TGO plus the background dust levels.

From this investigation it was concluded that the implementation of TGO would not cause the air quality parameters to exceed *annual* assessment criteria (see Table 1 below).

However, modelling for cumulative PM₁₀ 24-Hour impacts predicted that exceedances of the criteria would occur at

- the sensitive receiver R3, located to the south west of the Mine
- and receivers R28, 29, 32, 33 and 40 at Tomingley village (see locations in Figure 1)

Table 1: NSW Environment Protection Authority - Air Quality Impact Assessment Criteria

Indicator	Period	Value
Total Suspended Particulate matter (TSP)	Annual mean	90 µg/m ³
PM ₁₀	Annual mean	30 µg/m ³
	24-hr Maximum	50 µg/m ³
Depositional Dust	Annual	Maximum total deposition of dust 4 g/m ² /month

From the monitoring data available for the original air quality assessment (PAEHolmes, 2011) it was determined that the following background concentrations of dust would apply to the project:

- Annual Average TSP – 51 µg/m³
- Annual Average PM₁₀ – 20 µg/m³
- Annual Average Dust Deposition - 2 g/m²/month
- 24-hour Average PM₁₀ – daily variable

A greenhouse gas assessment was conducted using the National Greenhouse Accounts Factors 2010 published by the Department of Climate Change and Energy Efficiency. Projects are required to report to the National Greenhouse Emissions Reporting (NGER) system if they emit greater than 25kt of greenhouse emissions per annum. Based on the assessment, it is estimated the project will emit approximately 0.38Mt/yr. CO_{2-e} and therefore reporting under the NGER system will be required.

An application to modify PA 09_0155 was submitted to DPE in late 2015. Known as MOD 3, this modification was approved in July 2016. Although MOD 3 approved an additional open cut pit (Caloma 2), air quality emissions predicted for mining of this pit were assessed as part of the 2011 air quality assessment. Therefore, a full air quality assessment was not required for the MOD 3 environmental assessment; however, the original air quality assessment was reviewed. The review predicted an 11% increase in emissions resulting from proposed MOD 3 activities, which was unlikely to have a significant effect on emissions received at surrounding receivers nor result in exceedances of the air quality criteria. (Tomingley Gold Mine Environmental Assessment, Project Approval 09_0155 Modification 3, November 2015).

3. LEGISLATIVE REQUIREMENTS

3.1 LEGISLATIVE FRAMEWORK AND APPROVAL

The most recent TGO modification approval was assessed under Section 75J of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Project Approval was granted by the NSW Department of Planning and Infrastructure and Schedule 3, Condition 19 requires the preparation of an Air Quality and Greenhouse Gas Management Plan (this plan).

Schedule 3, Condition 19 is as follows:

“Air Quality and Greenhouse Gas Management Plan

19. The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Secretary. This plan must:

- (a) be prepared in consultation with the EPA and Council, and be submitted to the Secretary for approval by the end of January 2013, unless the Secretary agrees otherwise;*
- (b) describe the measures that would be implemented to ensure compliance with conditions 15-18 of this schedule, including a trigger action response plan based on complaints, air quality and visual monitoring and meteorological forecasting and monitoring ;*
- (c) include a program for the implementation of the measures referred to in (b) above;*
- (d) include an air quality monitoring program that*
 - (i) uses a combination of real-time and supplementary attended monitoring measures to evaluate the performance of the project;*
 - (ii) adequately supports the proactive and reactive air quality management system on site; and*
 - (iii) includes a protocol for determining exceedances of the relevant conditions of this approval;*
- and*
- (e) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site.”*

The TGO Environmental Protection Licence (EPL 20169) has no specific concentration limits or monitoring requirements for air quality, but does include the following operating conditions for dust control:

- O3.1: 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.
- O3.2: All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance.
- O3.3: Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

3.2 CONSULTATION

This plan has been developed in consultation with Narromine Council and The Environment Protection Authority (EPA) since 2012.

Revision 1 of the Air Quality and Greenhouse Gas Management Plan (AQGGMP) was provided to EPA and Narromine Council on 8th December 2012.

Revision 2 was not referred for agency comment – no material change.

Revision 3 was not referred for agency comment – no material change.

Revision 4 was prepared at the request of the EPA to reflect the most up-to-date best dust management practices and incorporate proactive and reactive management measures.

This revision (Revision 5) was an update following Approval of PA 09_0155 MOD 3 and was provided to DPE, EPA and Council on 22 September 2016.

Appendix 1 provides details of the consultation undertaken.

4. OBJECTIVES AND TARGETS

The table below details the objectives and targets with respect to Air Quality and Greenhouse Gas Management for TGO.

Table 2: Objectives and Targets

Objectives	Target
Minimise dust nuisance to surrounding residents	Maintain recorded annual average Depositional Dust levels below the nuisance level of 4g/m ² /month
No adverse health impacts a result of the project	PM ₁₀ levels remain lower than the national guideline of: <ul style="list-style-type: none">• 24-hour maximum of 50 µg/m³

5. EXISTING ENVIRONMENT

5.1 SURROUNDING RESIDENCES

Figure 1 below shows the location of residences surrounding TGO.

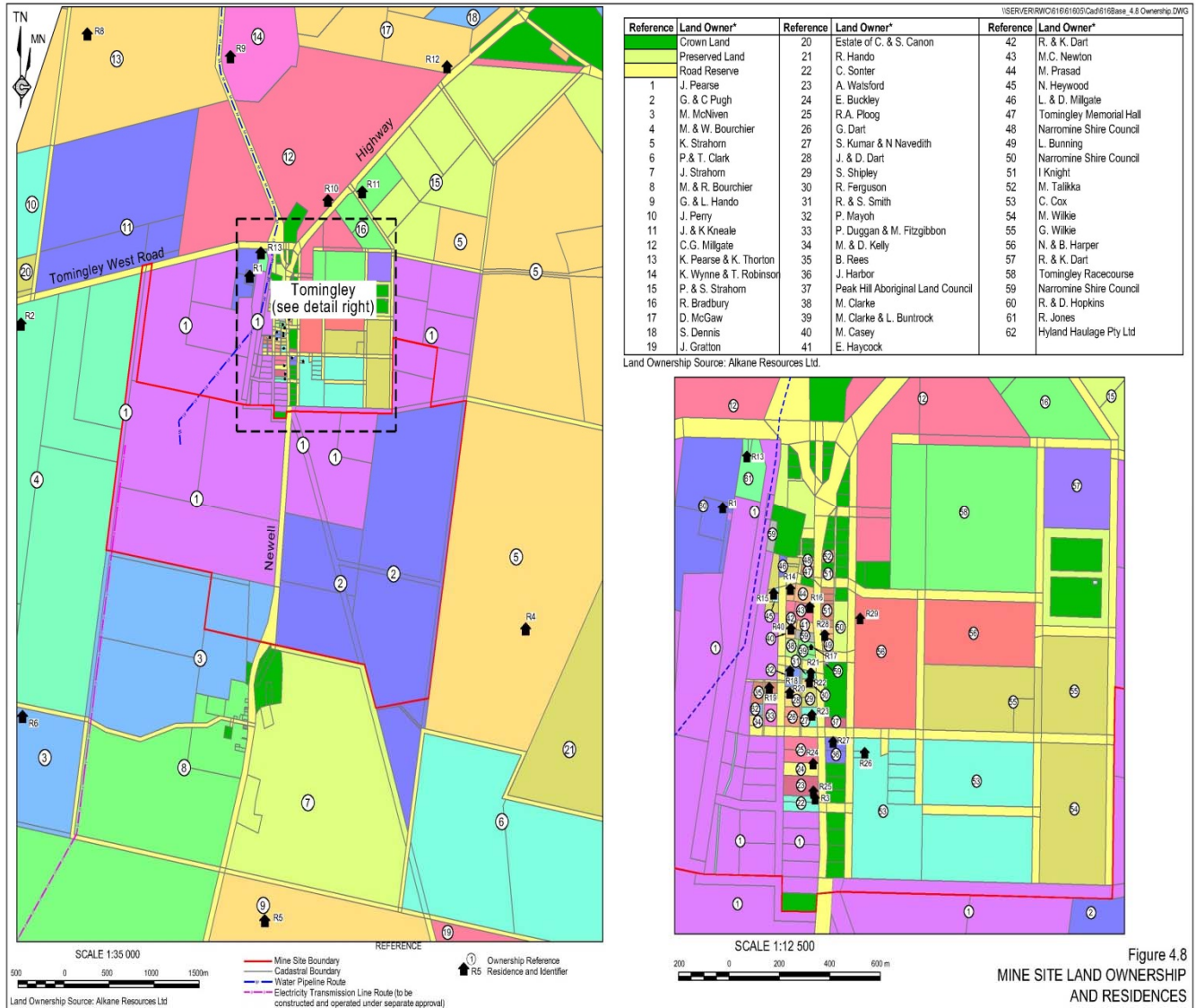


Figure 1 - Location of Sensitive Receptors

Narromine Shire Council predicts that the village of Tomingley will grow by one new residence each year over the next twenty years. However this growth is not seen as an issue with respect to the proximity of sensitive receivers to the mine site as the nearest receivers are already adjacent to the mining lease boundary thus making a closer neighbour not likely.

5.2 POTENTIAL PARTICULATE MATTER SOURCES

The following activities may result in particulate matter emissions during dry conditions.

- Vegetation clearing and soil stripping.
- Excavation of soil, waste rock and ore material and loading of that material into trucks.
- Truck placement of waste rock into Waste Rock Emplacements (WRE).

- Bulldozer movement of soil and waste rock
- Placement, spreading and ripping/tilling of topsoil
- Blasting.
- Primary and secondary crushing of ore.
- Road and hardstand area construction.
- Deposition of crushed ore on the stockpile.
- Delivery of road construction materials.
- Grading of unsealed roads.
- 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.
- Dust from dry tailings in the Residue Storage Facility (RSF).

5.3 PROJECT SITE WIND ENVIRONMENT

Figure 2 presents the annual and seasonal wind roses based on recent onsite meteorological data collected at TGO during 2015

- Overall for the year, the data show a high frequency of winds from the east north-east (ENE), followed by those from east (E), south (S), south southwest (SSW) directions. The annual mean wind speed for the Project is 3.7m/s and the percentage of calms (wind speed less than 0.5m/s) is 0.8%.
- In winter, winds are relatively lighter; in summer, winds tend to be stronger. In autumn, winds are rarely from south and south southwest.

5.3.1 Adverse Meteorological Conditions

The adverse meteorological conditions for the mine will be during periods of dry weather and/or high speed wind. The receptors downwind in such conditions could be adversely impacted. As the mine is located to the south and south-west of the Tomingley village, the main impacts to the village will be when wind is from south to south west. For the receptors to the west and south of the mine (receptors 3 and 4), the adverse wind conditions will be from the east north-east and east.

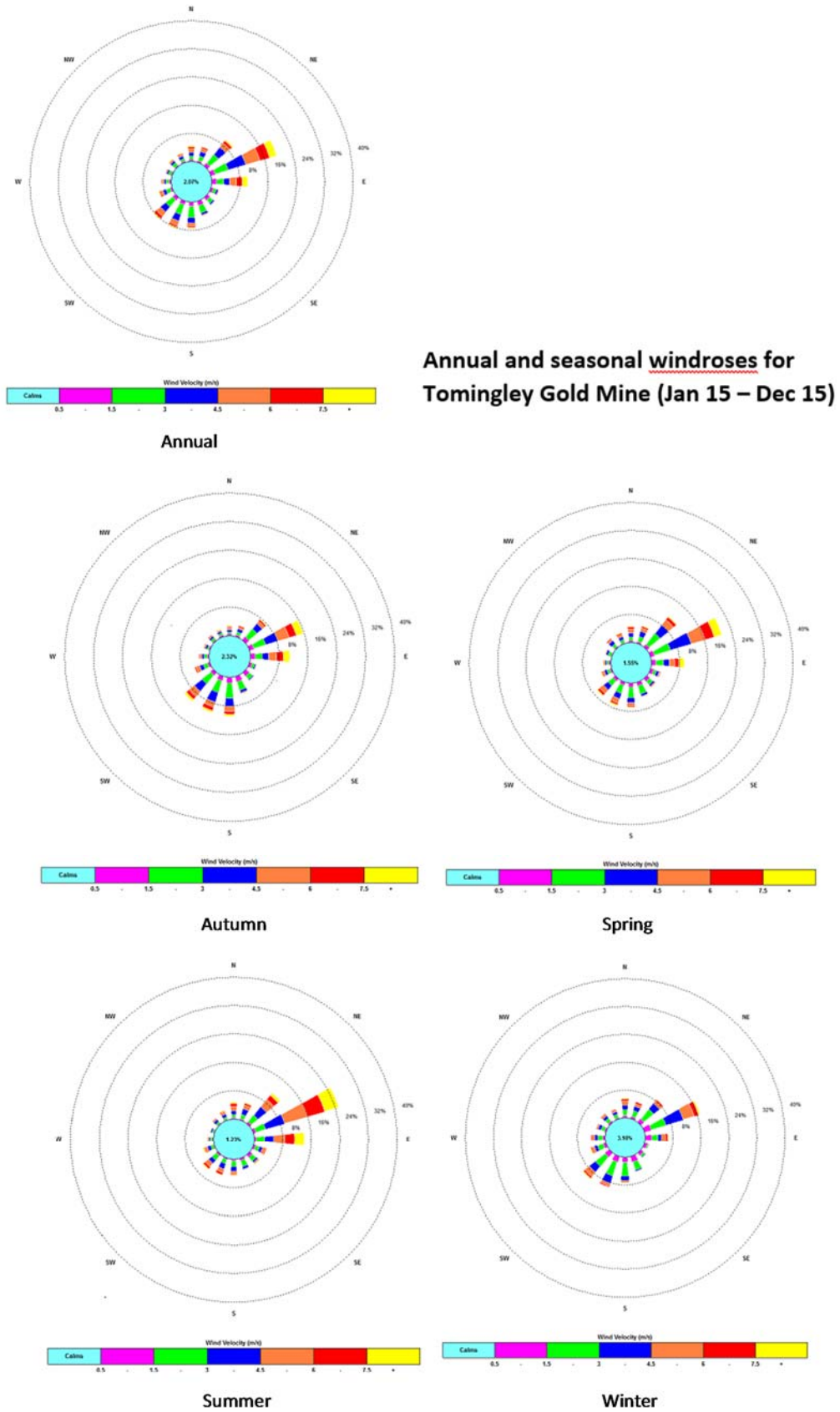


Figure 2 Annual and Seasonal Wind Roses – 2015

5.4 EXISTING PARTICULATE MATTER ENVIRONMENT

From the monitoring data available, PAEHolmes made the following assumptions regarding background concentrations applicable at the nearest residences.

- Annual average TSP: 51 $\mu\text{g}/\text{m}^3$.
- Annual average PM_{10} : 20 $\mu\text{g}/\text{m}^3$.
- 24 hour maximum PM_{10} : daily varying.
- Annual average dust deposition of 2 $\text{g}/\text{m}^2/\text{month}$.

These assumed background levels are conservative in that they include data from years when mining and processing activities were occurring at Peak Hill. It is anticipated that actual background levels would be lower than these levels.

6. MANAGEMENT MEASURES

6.1 PARTICULATE MATTER

6.1.1 Dust Management during Operations

Management measures implemented during mining operations to minimise the occurrence of wind-blown dust are detailed in the Site Specific Procedure of Dust Control. The Dust Control SSP is included as Appendix 2 and (in summary) includes the following measures:

- Pre-emptive measures for dust control, including;
 - Inductions
 - Mine planning
 - Weather condition monitoring
 - Visible dust monitoring and management
 - Water cart operations
 - Personnel Health Management
- Area specific controls for;
 - Caloma
 - Wyoming
 - Processing area
 - ROM pad
 - Scraper operations
- Proactive/reactive dust controls actions based on visual, climatic, predicted weather and operational triggers.

As well as the specific dust control actions included in the Dust Control SSP, general preventative or organisational air quality management measures that have been implemented at TGO are outlined in Table 4.

Table 4: Air Quality Control Measures During Mining Operations	
Control Wind Erosion	Disturb only the minimum area necessary. Review annually for potential improvement.
	If exposed area is a potential source of dust emissions and is likely to be exposed for between 3-12 months a spray on erosion control product is to be applied. For any time greater than 12 months, revegetation should take place.
	Rehabilitate completed sections of the waste emplacement as soon as practicable. Review annually for potential improvement.
	Fencing, shelterbelts or in-pit dump of waste emplacement shall be investigated as a possible mean to reduce surface wind speed of exposed areas, waste emplacement and stockpiles.
	Include information in the project induction on the requirement to drive only on designated haul roads, maintain site speed limits and notify a supervisor if you see visible dust generation.
	Delineate haul roads, with marker posts or cones to control their locations.
	Rehabilitate roads as soon as possible once they are no longer in use.
	Limit the development of minor roads.
Drilling and Blasting	During drilling operations use dust aprons, dust extraction and water injection to manage the dust.
	Monitor weather forecast to help plan blasting operations.
	Undertake blasting operations in appropriate wind conditions. Use data from the weather station and Weatherzone Mining Dashboard to gauge wind speed and direction to help guide blasting operations, for example a strong southerly wind may carry fugitive dust towards Tomingley village.
	Ensure adequate stemming is used during blasting operations.
Conveyors	Enclose conveyor transfer points within the crushing and screening unit.
Ore Processing	<p>Install and operate spray bars within the crushing and screening circuit of the processing operations to produce a fog of water to suppress dust. Points at which this will be installed are as follows:</p> <ul style="list-style-type: none"> • The ROM back bin and side walls, with a sensor that allows the system to be turned on when the loader approaches • The mouth of the primary crusher • The conveyor between the primary crusher and the secondary crusher • The discharge point to the head chute in the screening tower • The inlet to the screening tower • The oversize outlet to the screening tower • Loading points to the conveyors for the transfer of screened material to and from the screening tower and surge bin.
Material loading and dumping	Use of water sprays or water carts with boom spray or cease/modify activities on dry windy days.
	Minimise dropping height from diggers to trucks and use short tipping on WRE to minimise dust generation from material movement down dump face.

6.1.2 Dust Management for Adverse Weather Conditions

During dry conditions, and high wind speeds at the mine, especially when the wind is blowing toward the village (that is when winds are blowing from the south/south-west), the following additional dust control measure will be implemented:

- Activities capable of generating dust will be curtailed in the higher exposed areas.
- Additional water will be applied to internal roads in use by haul trucks.
- Any other open areas capable of generating dust will be watered by the water truck and potentially with the water truck's water cannon.
- Activities capable of generating dust will be curtailed or ceased across the Mine.

Preparatory measures that can be put in place for adverse weather include:

- Aim to have surface moist before the on-set of windy conditions. The area of focus should be where significant site work will be taking place for that day;
- Prepare for water cart spraying or sprinkler system during high winds;
- Prepare to cease certain activities or reduce activity level; and
- Schedule maintenance for plant and equipment to reduce dust generating activities.

All periods of curtailed activities will be recorded for inclusion in the Annual Review.

6.2 ODOUR

An 'offensive odour' is defined under the Protection of the Environment Operations Act 1997 as:

"...an odour which is harmful to a person who is outside the premises from which it is emitted or which interferes unreasonably with the comfort or repose of a person outside the premises from which it is emitted"

It is an offence for an occupier of scheduled premises (i.e. premises with an Environment Protection Licence) to emit 'offensive odours' other than in accordance with their EPL. Condition L6 of the TGO EPL (EPL 20169) states that "The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises."

Mining activities at TGO are not expected to generate any offensive odours. Given the scale of blasting operations, shot design and management practices, explosives products used, and properties of geological strata encountered at TGO, it is unlikely that blasting would generate fumes of sufficient scale to impact on sensitive receptors,.

6.3 GREENHOUSE GAS

6.3.1 Vehicles and Equipment

Light vehicles, dump trucks, excavators, drills, dozers, scrapers, graders and any other mobile equipment will all undergo regular maintenance on site. They will be serviced by TGO's a full time maintenance fitter in the on-site workshop.

6.3.2 NGER

The legislative framework for the National Greenhouse and Energy Reporting Scheme (NGERS; established under the National Greenhouse and Energy Reporting Act 2007 (DCC, 2008)) requires mandatory reporting for facilities or corporations who trigger relevant greenhouse gas (GHG) or energy consumption thresholds.

The facility threshold is 25kt of CO₂-e or 150TJ of energy consumed. The Project will exceed the facility threshold from year 1 of operation onwards, and as such will be required to report under NGERS.

As a result, TGO record data necessary for reporting to the NGER Scheme.

TGO will implement the greenhouse gas reporting system, *EnviroSuite*, to track energy consumption and greenhouse gas emissions, establish targets for reduction and facilitate assessment and reporting against targets for reduction. The results from the greenhouse gas reporting system will be regularly reviewed to ensure the data being collected is meaningful.

6.3.3 Minimisation

TGO will continue to investigate ways to minimise the release of greenhouse gas to the environment

This may include:

- The use of solar powered lighting;
- The use of energy efficient pumps and motors; or
- Ongoing education via inductions and toolbox presentations on reporting energy wastage.

7. AIR QUALITY MONITORING

7.1 PURPOSE

Schedule 3, Condition 19 of the Project Approval states that the AQGHGMP must include:

“An air quality monitoring program that

- (i) uses a combination of real-time and supplementary attended monitoring measures to evaluate the performance of the project;*

- (ii) adequately supports the proactive and reactive air quality management system onsite; and
- (iii) includes a protocol for determining exceedances of the relevant conditions of this approval;”

. The TGO air quality monitoring program has been designed to satisfy PA 09_0155, Schedule 3, Condition 19..

EPL 20169 has no specific concentration limits or monitoring requirements for air quality.

Air quality monitoring results are used for:

- evaluating and reporting project compliance;
- assessing and reporting project performance; and
- active project management, including incident and complaint management and investigation.

7.2 AIR QUALITY IMPACT ASSESSMENT CRITERIA

TGO shall employ all reasonable and feasible management measures to ensure that particulate matter emissions generated by the project do not exceed the criteria listed below in Table 5 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 5 – Air Quality Impact Assessment Criteria

Long term impact assessment criteria for particulate matter

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

Short term impact assessment criterion for particulate matter

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

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:

- ^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.

7.3 MONITORING EQUIPMENT

To satisfy PA 09_0155, Schedule 3, Condition 19 , the following monitoring equipment has been installed surrounding the Project Site. The location of this equipment is presented in Figure 3.

- One Tapered Element Oscillating Microbalance (TEOM) measuring PM₁₀.
- One High Volume Air Sampler (HVAS) measuring Total Suspended Particulates (TSP). The TSP HVAS will collect data on a campaign basis every 6th day. From the data collected, a ratio of PM₁₀ to TSP can be determined and then used in conjunction with the TEOM PM₁₀ data to assess future TSP compliance.
- Five dust deposition gauges.
- One Meteorological Weather Station.

PA 09_0155, Schedule 3, Condition 20 specifies that for the life of the Project, the proponent must install a meteorological station in the vicinity of the site. Figure 3 shows the location of the meteorological station which is approximately 520 m to the northwest of the Project boundary.

Condition M3.1 of TGO’s Environment Protection Licence states that the following parameters must be monitored:

Monitoring Point 1 – Weather Station on Mine Site

Parameter	Units of Measure	Frequency	Averaging Point	Sampling Method
Rainfall	mm	Continuous	1 hour	AM-4
Wind Direction @ 10 metres	Degrees	Continuous	15 minute	AM-2 & AM-4
Wind speed @ 10 metres	m/s	Continuous	15 minute	AM-2 & AM-4
Additional Requirements - Siting - Measurement				AM-1 & AM-4 AM-2 & AM-4

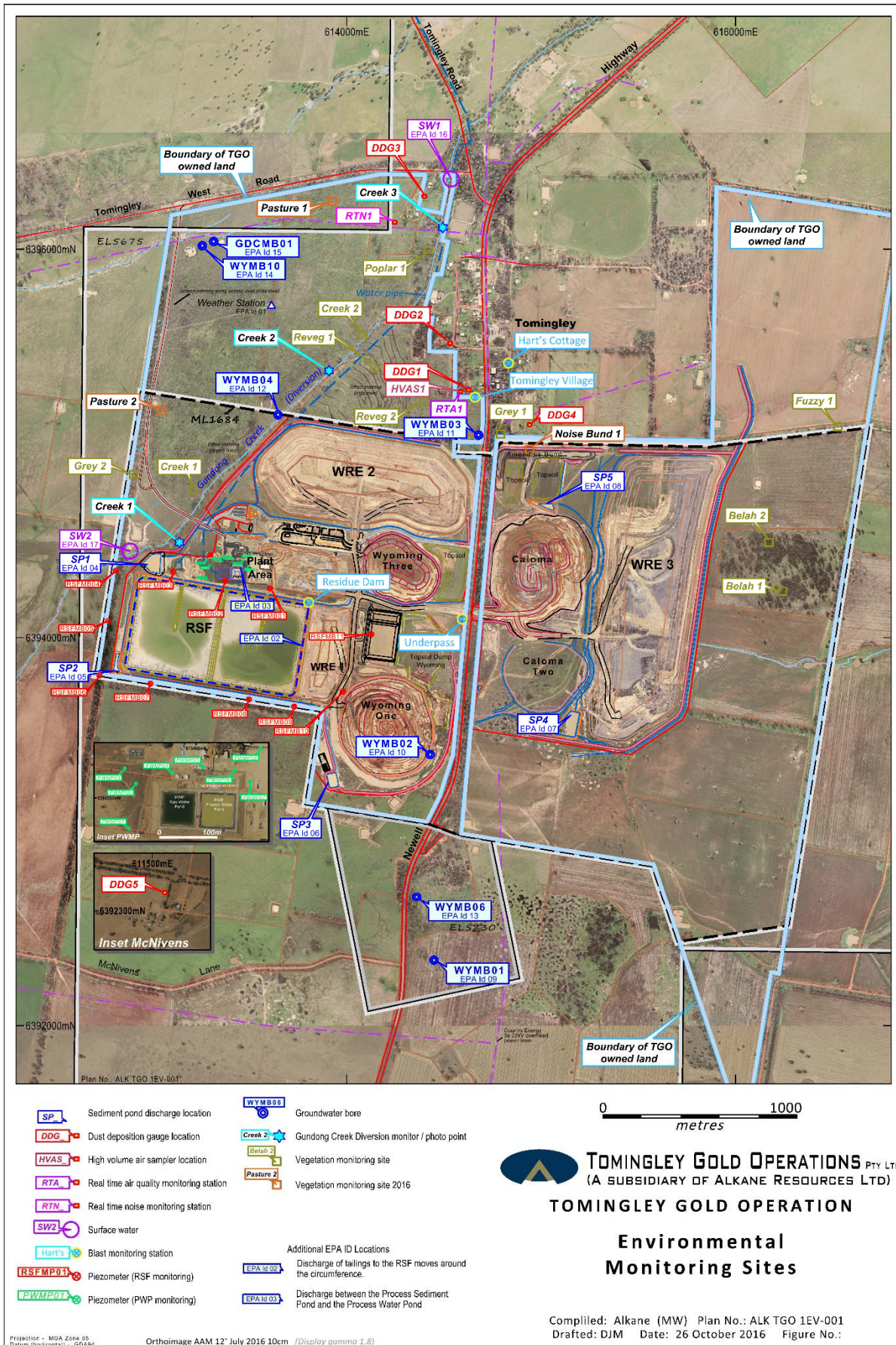


Figure 3: Location of monitoring stations

7.4 MONITORING PROCEDURES

7.4.1 Meteorological Monitoring

A meteorological station is in place on site to provide continuous, real-time measurements. Real-time data can be accessed via the internet from any location.

TGO will ensure that the meteorological station is operated throughout the life of the Project in accordance with the following guidelines.

- NSW OEH Approved methods for the sampling and analysis of air pollutants in NSW (DECC, 2005);
- Australian Standard and New Zealand Standard (AS/NZS) 3580.1.1:2007 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment;
- AS 2923:1987 Ambient air - Guide for measurement of horizontal wind for Air Quality Applications (AM-2); and
- USEPA (2000) EPA 454/R-99-005 Meteorological monitoring guidance for regulatory modelling applications (AM-4).

7.4.2 Dust Deposition Monitoring

Five dust deposition gauges are installed in the community surrounding the Project site and in the vicinity of the nearest and most affected private receptors (Figure 1).

The dust deposition gauges are installed and will be used in accordance with the following guidelines:

- AS 2922:1987 Ambient Air - Guide for the Siting of Sampling Units (NSW DECCW Method AM-1), and the NSW DECCW Approved methods for the sampling and analysis of air pollutants in NSW (DECC, 2005).
- The dust deposition gauges are sampled in accordance with AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method (AM-19).

Dust deposition will be measured and reported on a monthly basis. Exposed gauges will be replaced on a monthly basis with analysis conducted at a NATA accredited laboratory for insoluble solids.

7.4.3 HVAS Monitoring

One HVAS has been installed at 40 Myall Street, Tomingley, (in the yard of the closest receptor) just north of the Project site. The HVAS measures TSP on a 24-hour, one-day-in-six frequency and is co-located with the TEOM.

The HVAS unit will be operated in accordance with the following guidelines:

- AS 2922:1987 Ambient Air - Guide for the Siting of Sampling Units (NSW DECCW Method AM-1), and the NSW DECCW Approved methods for the sampling and analysis of air pollutants in NSW (DECC, 2005).

- The HVAS shall be sampled in accordance with AS/NZS 3580.9.3:2003 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method (AM-15).

7.4.4 TEOM Monitoring

One TEOM is installed in the yard of 40 Myall Street, Tomingley in adjacent to the HVAS just north of the Project site. The TEOM measures PM₁₀ on a continuous basis.

Data can be accessed at any location via the internet.

The TEOM unit will be operated in accordance with the following guidelines:

- The TEOM shall be located and installed by a qualified professional in accordance with AS 29221987 Ambient Air - Guide for the Siting of Sampling Units (NSW DECCW Method AM-1), and the NSW DECCW Approved methods for the sampling and analysis of air pollutants in NSW (DECC, 2005).
- The TEOM shall be sampled and maintained in accordance with AS/NZS 3580.9.8:2008 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM₁₀ continuous direct mass method using a tapered element oscillating microbalance (AM-22).
- Hourly and calendar day average data shall be calculated and made available to the relevant TGO personnel (under local standard time, without daylight saving times), according to the National Environment Protection (Ambient Air Quality) Measure – Technical Paper No. 5 (NEPM, 2001).

7.5 GREENHOUSE GAS DATA COLLECTION

The parameters monitored for greenhouse gas reporting include the secondary parameters of electricity and diesel usage.

A summary of the frequency of greenhouse gas monitoring and the personnel responsible are presented in the table below.

Table 6: Data Collection for Greenhouse Gas Reporting

Parameter Monitored	Frequency	Person Responsible
Electricity usage	Collected Monthly	Processing Manager
Diesel usage	Collected Monthly	Administration and Finance Manager
LPG usage	Collated Quarterly	Environment Superintendent

Data collection for greenhouse gas reporting purposes will take place for the duration of the mining operation. Should mining operations cease temporarily, e.g. due to changes in market demand, greenhouse gas monitoring may be suspended until the recommencement of operations.

8. AIR QUALITY RESPONSE PLAN

8.1 PROACTIVE MANAGEMENT - PLANNING FOR ADVERSE WEATHER

Condition 18 (b) of the Project Approval conditions requires the proponent to:

'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'.

Six-day site specific forecasts are available from Weatherzone - miningzone. This data is reviewed daily by the TGO who will check weather conditions for coming days and plan accordingly for adverse weather.

Adverse weather, in terms of dust impacts, relates to hot, dry and gusty / windy conditions and specifically in relation to this project is:

- Little or no rainfall forecast and little or no rainfall in past 48 hours; and
- High wind speeds (> 30 km/hr) from the south/south-west and towards nearest sensitive receptors.

8.2 PROACTIVE MANAGEMENT – REAL TIME DUST MANAGEMENT

A proactive dust management system has been implemented to manage dust issues during the mine operation according to real-time meteorological conditions and air quality observations. The goal is to ensure the 24-hour average PM₁₀ concentrations remain below the assessment criterion.

The proactive air quality management system operates as follows.

The continuous TEOM PM₁₀ monitor will relay the data in near-real-time to a website. This website shall be accessible to the relevant mine personnel on a continuous basis. An SMS alarm will be sent to relevant mine personnel when pre-determined levels are breached, which would in turn indicate what and when action is required.

Two PM₁₀ concentration trigger levels are applicable for the mine.

Trigger Level 1 – Investigation Level

Current instantaneous PM₁₀ concentrations indicate that dust levels are elevated and activities from the Mine may be contributing to these elevated levels. If Trigger Level 1 is exceeded, Mine personnel will investigate prevailing winds, determine what activities are occurring on site that may be contributing to elevated dust levels. Site personnel will then be informed that dust emissions are increasing and action(s) may be required.

Trigger Level 2 – Action Level

Rolling 24-hour average PM₁₀ concentrations continue to be elevated and activities from the Mine are identified as contributing to these levels. If Trigger Levels 2 are breached, remedial action is required and additional dust control measures will be implemented.

Interim trigger values are presented below. It is proposed that trigger levels would be reviewed regularly to ensure they are working appropriately i.e. they are ensuring that dust levels remain below ambient air quality goals.

Trigger Level 1: current instantaneous PM₁₀ concentrations are above 90µg/m³ for three consecutive hours. Under Trigger Level 1, the Mine personnel will determine which way the wind is blowing for the same three-hour period and determine what Mine activities are most likely contributing to the elevated PM₁₀ levels. The Mining and Processing Manager will ensure that control measures and actions outlined in Section's 6 and 7 are being implemented. Additional dust control measures to be implemented will depend on the activities occurring on site at the time but may involve:

- Increasing the frequency of watering for exposed areas and stockpiles;
- Increasing the frequency of watering on unsealed roads; and
- Modifying site activities depending on the sources contributing to the elevated levels.

Trigger Level 2: Rolling 24-hour average PM₁₀ concentrations are above 40µg/m³ and the wind is blowing from the Mine towards the residences. In the event Trigger level 2 is exceeded at the monitoring location, the Mining Manager and Processing Manager will identify those activities capable of generating dust and instruct that the activity be curtailed until 24-hour average PM₁₀ concentrations drop below 40 µg/m³.

In the event that air quality monitoring identifies an exceedance of the air quality criteria identified in Schedule 3 Condition 17 of the approval, the exceedance will be investigated to determine the likely cause(s). All corrective and preventative actions are entered into the Online Reporting Database. An investigation will then follow to determine:

- what immediate action(s) need to be taken to fix the problem in the short term, if applicable;
- the root causes of the problem (e.g. management system, equipment design / performance, human factors/behaviour, work environment or training);
- corrective actions required to eliminate the root cause(s);
- action(s) taken to verify effectiveness of corrective action(s) (i.e. what measures and checks are taken to ensure the corrective actions that are in place are effective to prevent any further exceedance); and
- on completion of the investigation, an electronic copy will be forwarded to Regional Manager for review/approval of corrective and preventative actions.

In accordance with TGO procedures, if an event or activity occurs that has caused, is causing, or is likely to cause harm to the environment, whether the harm occurs on or off the premises, TGO will notify the EPA (on telephone: 131 555) after it becomes known to any employee or contractor. The notification to EPA will be given as soon as practicable after the incident and a report will be prepared and submitted to the EPA within 7 days of the exceedance.

The key corrective and preventative actions are likely to focus upon the effectiveness of the dust controls on haul road watering, dust control on dozers, truck loading and unloading activities and wind erosion of crusher and ROM stockpiles. The Mining

Manager and Processing Manager will ensure that the appropriate level of control is re-established as soon as possible after the problem(s) are identified.

8.3 NON-COMPLIANCE AND CORRECTIVE ACTION

Where the compliance evaluation indicates non-compliance with the Impact Assessment Criteria, the following actions will be undertaken:

- Identify the activities that were occurring at the time of the non-compliance;
- Determine the activities that were most likely contributing to the non-compliance;
- Review the process and current controls in place for these activities; and
- Implement a best practice alternative to more adequately control dust generation.

Table 7 below lists timing/triggers which are primarily in response to visual inspection, however corrective measures will also apply when alerts are triggered by the trigger levels identified for the Project (as per Section 10.2).

Table 7: Dust Emissions – Triggers and Corrective Measures

Timing/Trigger	Measure	Responsibility
Visible dust from haul roads	Relocate water cart operations to control haul road dust Modify operations as required to avoid overly dusty haul roads	Mining Manager
High winds	Relocate waste rock emplacement operations away from elevated levels	Mining Manager
Dust emissions are >1½ times above the truck height while being loaded	Increase material moisture by water sprays on material being loaded	Mining Manager
Dust emissions are above the truck cabin roof during waste rock dumping	Increase material moisture by water sprays on material being loaded / move to lower emplacement areas	Mining Manager
Dust emissions are above the height of drill rig	Ensure water application is adequate during drilling.	Mining Manager
Excessive dust generation from exposed material emplacement areas or other exposed areas	Increase watering where practical Temporarily rehabilitate exposed material that is not being utilised for extended periods of time.	Mining Manager and Processing Manager
Excessive/prolonged generation of exhaust fumes	Ensure equipment is maintained to manufacturers' specifications Avoid exposure of equipment to sensitive receivers	Mining Manager

Timing/Trigger	Measure	Responsibility
	Turn equipment engines off when not required	

8.4 COMPLAINTS HANDLING

TGO maintains a 24-hour 7 day, Community Complaints Number (02 6865 6116). Information about the project, general enquiries and the opportunity to make a complaint are accessible by calling this number.

In addition to this, complaints can be lodged by email at info@tomingleygold.com.au or by visiting the site office.

Complaints are recorded and investigated in accordance with the Site Specific Procedure for handling complaints.

The complaints register is maintained and updated on the project website monthly.

9. REPORTING AND EVALUATION OF COMPLIANCE

TGO prepares a Monthly Environmental Monitoring Report. This report includes an assessment of monitoring data against performance criteria. This report is reviewed by the TGO Operations Manager and Alkane's General Manager NSW. This information is updated and made available on the project website www.alkane.com.au within 28 days of the end of the month.

The Monthly Environmental Monitoring Reports are collated into the TGO Annual Review, which is submitted to relevant government agencies. . This annual report is also made publicly available on the Alkane website once approved by Alkane senior management.

10. ROLES AND RESPONSIBILITIES

The following table outlines the roles and responsibilities of personnel with reference to management of air quality and greenhouse gas.

Table 8: Roles and Responsibilities

Role	Responsibilities
TGO Operations Manager	Accountable for the overall environmental performance of the operations, including the outcomes of this Plan.
Environment and Community Manager	Ensure the implementation of this Plan, including reporting of non-compliances, and implementation of corrective action plan. Ensure employees are competent through training and awareness programs.

Blast Superintendent	Designand execute blasts to ensure compliance. Review monitoring data and where non-compliance occurs, advise Environment and Community Manager and Mining Manager. Assist with exceedance investigations.
Mobile Equipment / Fixed Plant Operators	Ensure operations are undertaken in accordance with instructions. Ensure appropriate notification and response in the event of an environmental incident. Show due care not to cause environmental harm.
All Personnel	Follow direction provided by the Operations Manager, Mining Manager and Environment and Community Manager. Show due care not to cause environmental harm. Notify Supervisor/Environment and Community Manager of any environmental non-compliance.

11. COMPETENCE TRAINING AND AWARENESS

All personnel working at TGO will undergo an 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.

12. REVIEW

This plan will be reviewed annually to ensure the adequacy of the plan and allow for opportunities of improvement

13. REFERENCES

NEPM (2001). National Environment Protection (Ambient Air Quality) Measure – Technical Paper No. 5 – Data Collection and Handling. May 2001.

PAEHolmes (2011). Tomingley Gold Project Air Quality Assessment. Prepared for R.W. Corkery & CO. Pty Limited on behalf of Alkane Resources Ltd. Jon No. 3363. September 2011.

Appendix 1

Consultation with Narromine Shire Council and The Environment Protection Authority on the preparation of this Plan

Colleen,

The EPA's comments provided on 18 October 2012 remain relevant to the Air Quality and Greenhouse Gas Management Plan (attached). Aside from this the EPA does not have any additional comments.

Regards,

Brad

Brad Tanswell

Acting Head Pesticides Operations and Planning Unit | NSW Environment Protection Authority |

☎: (02) 6883 5367 | 📠: (02) 6884 8675 | 48-52 Wingewarra Street Dubbo NSW 2830 | 📧: bradley.tanswell@environment.nsw.gov.au

Good afternoon Colleen,

My apologies for taking so long to get back to you - we have had some water dramas here recently.

Our Manager of Environmental Services, Mark Robertson has had a read through and has noted that he is generally ok with the document. Our only comment being that we would request a comment on the impact of the expansion of Tomingley on the impacts of air quality. The estimated growth is slightly over 1 dwelling per year for 20 years, which I understand is minimal, however they are all estimated to be around the mine site in and around Tomingley.

If I could refer you to the agricultural lands strategy (rural residential lands) on our website www.narromine.nsw.gov.au - currently on public exhibition, it will indicate the approximate location of these dwellings.

Thanking you

Kylie Rowe

A/Director Planning & Environmental Services

Sent: Monday, 10 December 2012 11:03

Subject:

— Forwarded by Mail Records/Narromine on 10/12/2012 11:03 AM —



Our reference: DOC 12/40664, FIL09/10071
Contact: Brad Tanswell

Managing Director
Alkane Resources Ltd
P.O. Box 4384
VICTORIA PARK WA 6979

Attention: Colleen Measday

Dear Mr Chalmers,

I refer to the Scheduled Development Work licence application and accompanying information submitted to the Environment Protection Authority (EPA) on 7 August 2012 in relation to the proposed Tomingley Gold Mine.

Additionally I refer to the Air Quality Management Plan (AQMP) which accompanied the licence application and revised Construction Noise Management Plan received by the EPA on 4 October 2012.

The EPA have prepared the draft Scheduled Development Works Environmental Protection Licence (EPL no 20169) for the Tomingley Gold Mine, which is enclosed. Could you please examine the draft licence and provide comments back to the EPA by 23 November 2012. Should the EPA not receive comments by this date; the EPA will assume that you approve of the proposed Licence and the licence will be issued.

With reference to the AQMP section 7.3 advises that the real time monitoring via TEOM will be used for a minimum of 12 months. The EPA would like to advise that for monitoring to be 'fit for purpose' (inform management practices and the community) it must be ongoing for the life of the project where significant dust generating activities occur. The nature of the ongoing real time monitoring i.e. the equipment and site selected, may change based on the future needs. This should be informed by local knowledge in consultation with suitably experienced practitioners.

As part of the regulatory process, the EPA encourages the preparation of strategies, programs and plans such as the management plans mentioned above as useful tools for industry to ensure they meet their statutory obligations. As a regulatory authority the EPA does not review or comment on these plans in terms of adequacy, unless there is a specific reason to do so. The EPA does not endorse the details of these plans. These strategies, programs and plans are for the benefit of the Company.

Further, the EPA has not reviewed the management plans referred to above or those submitted with the licence application for adequacy in terms of meeting statutory obligations under legislation such as the *Protection of the Environment Operations Act 1997* or *Environmental Planning and Assessment Act 1979* or for consistency with current planning consents. The preparation of the Management plans mentioned does not mitigate or reduce Alkane's obligations to comply with the relevant legislation including, but not limited to that mentioned above or with existing Development Consents.

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ABN 30 841 387 271
www.environment.nsw.gov.au

Once issued, EPL 20169 will allow Alkane Resources Ltd to undertake Scheduled Development Works associated with establishment of the Tomingley Gold Mine in accordance with development consent issued by the Department of Planning and Infrastructure. This does not permit the undertaking of Scheduled Activities associated with mining operations. Alkane Resources Ltd will need to make a separate application to EPA for an EPL to allow Scheduled Activities to be carried out.

Should you have any enquiries regarding this matter, please contact myself at the Dubbo Office of OEH by telephoning (02) 6883 5330.

Yours sincerely,



18/10/12

BRAD TANSWELL
A/Head Pesticides, Operations and Planning
Environment Protection Authority

Appendix 2

TGO Site Specific Procedure for Dust Control

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 originally assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). The most recent TGP modification approval (MOD2) was assessed under Section 75J 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 2)

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	^d 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	^d 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 [Secretary](#).

Figure 2: EPL conditions

4 Operating Conditions

01 Activities must be carried out in a competent manner


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Environment Protection Authority - NSW
Licence version date: 4-Sep-2013

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 20169



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/m ² /month
No adverse health impacts as a result of the project	PM10 levels remain lower than the national guideline of: <ul style="list-style-type: none"> • 24-hour maximum of 50µg/m³

5. EXISTING ENVIRONMENT

5.1 SURROUNDING RESIDENCES

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

Figure 3: Proximity of adjoining dwellings

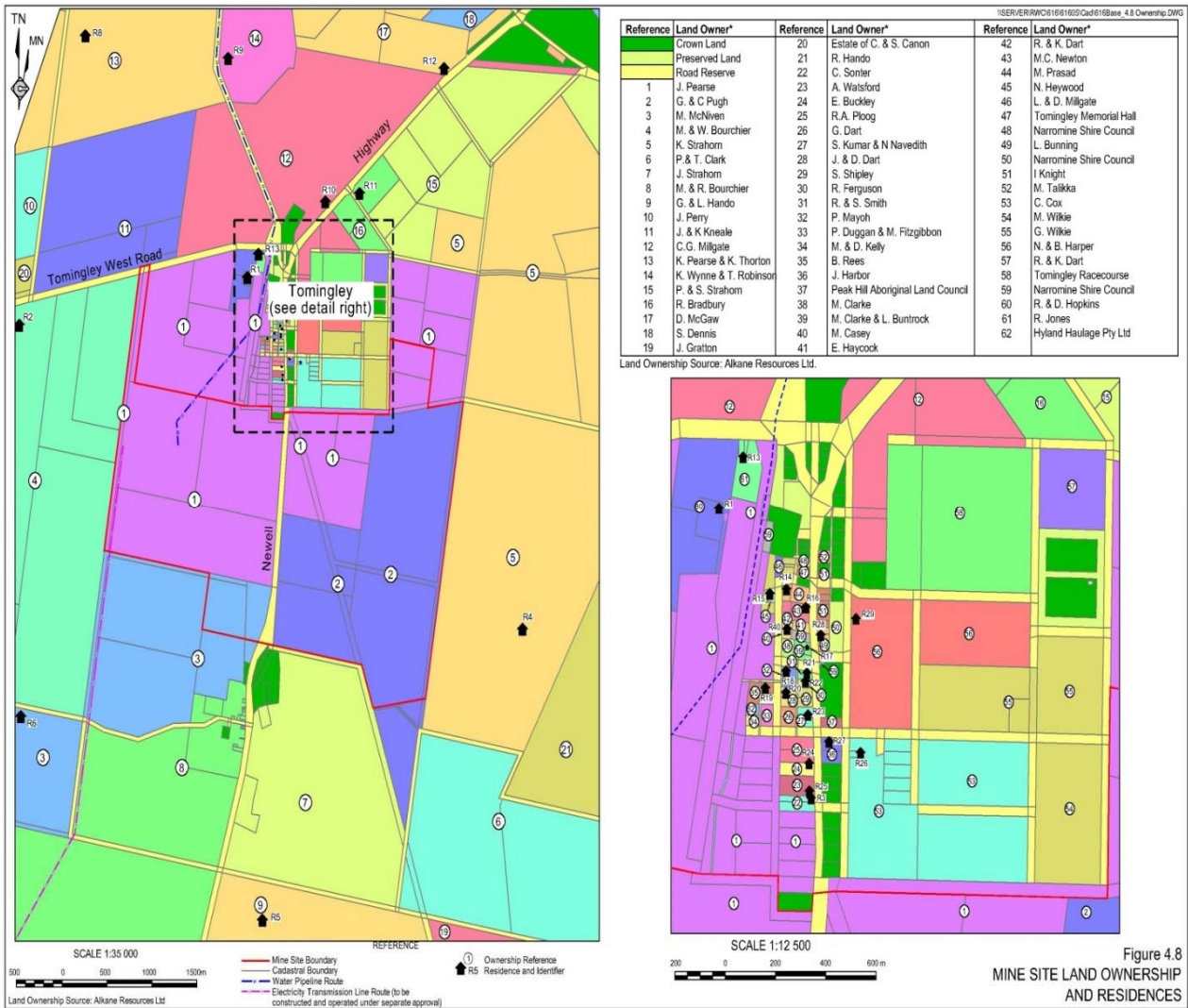


Figure 4.8
MINE SITE LAND OWNERSHIP
AND RESIDENCES

5.2 POTENTIAL DUST SOURCES

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

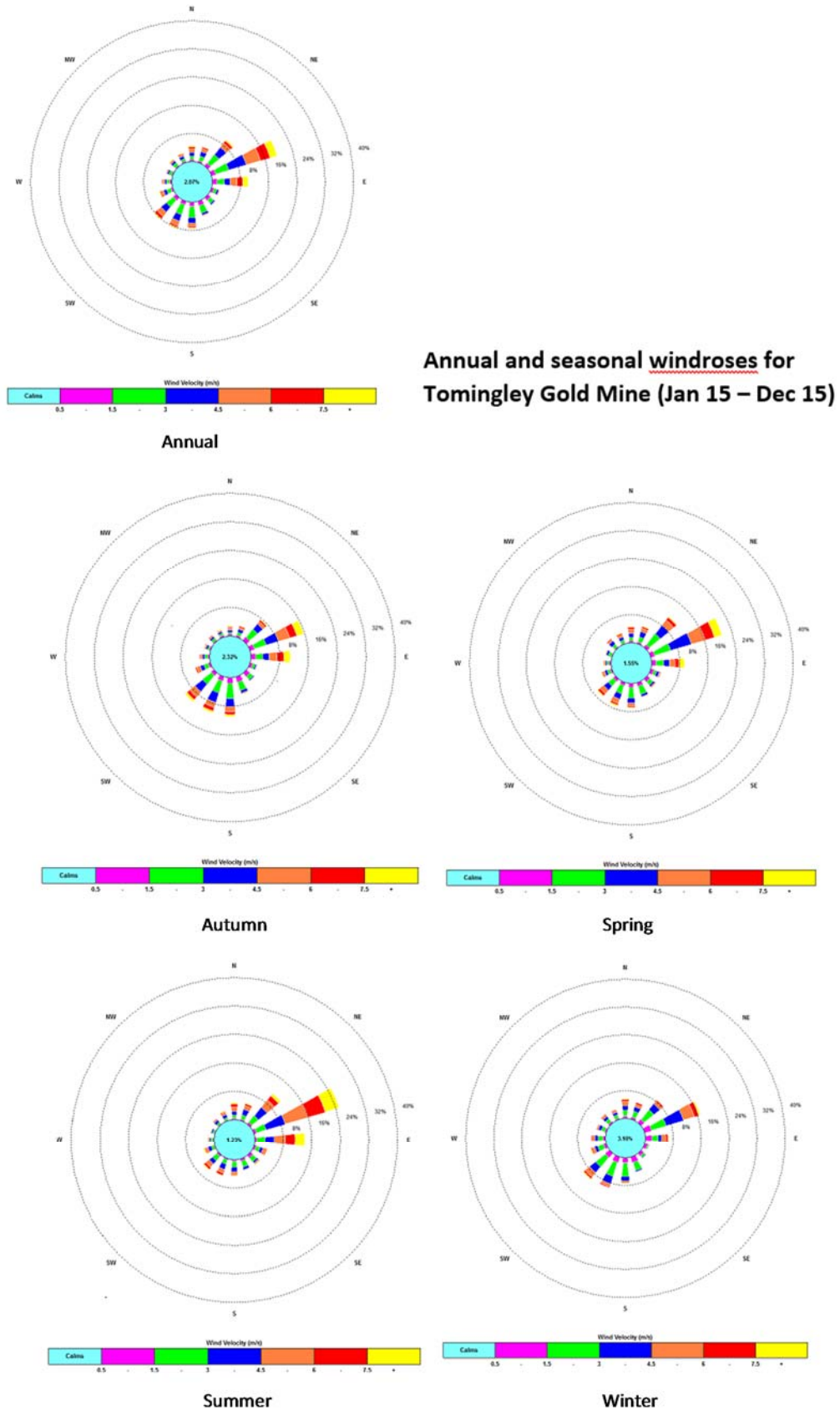
- Vegetation clearing and soil stripping.
- Excavation of soil, waste rock and ore material and loading of that material into trucks.
- Blasting.
- Primary and secondary crushing of ore.
- Road and hardstand area construction.
- Deposition of crushed ore on the stockpile.
- Delivery of road construction materials.
- 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.
- Dust from dry tailings in the Residue Storage Facility (RSF).

5.3 PROJECT SITE WIND ENVIRONMENT

Figure 2 presents the annual and seasonal wind roses based on recent onsite meteorological data collected at TGO during 2014.

- Overall for the year, the data show a high frequency of winds from the east north- east (ENE), followed by those from east (E), south (S), south southwest (SSW) directions. The annual mean wind speed for the Project is 3.7m/s and the percentage of calms (wind speed less than 0.5m/s) is 0.8%.
- In winter, winds are relatively lighter; in summer, winds tend to be stronger. In autumn, winds are rarely from south and south southwest.

Figure 4: Wind Roses indicating prevailing wind directions



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. The site specific Weatherzone system has been set up to provide predictive weather alerts to assist in mine planning. Alternate work areas and tasks are to be planned to provide a contingency for unfavorable weather conditions.
Weather conditions	<p>Where it is identified that adverse weather conditions maybe experienced during the shift, the Shift Supervisors 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:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>As the majority part of the mine is located to the south of the Tomingley village, the main impacts to the village will be when wind from south to south west</p>

<p>Visible Dust Monitoring and management</p>	<p>Shift Supervisors 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 Area Superintendent (or delegate) is to be notified. In field wind socks to aid in targeting high risk areas from a visual wind direction assessment are also an aide to supervisors.</p>
<p>Water Cart Availability</p>	<p>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. Shift Supervisor (depending on responsibility for activity) is to notify the Area Superintendent immediately. In accordance with the EPL, works cannot re-commence until dust control measures are reinstated.</p>
<p>Water Application</p>	<p>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 Shift Supervisor, arrangements for repairs are to be made as quickly as possible.</p>
<p>Pre-watering prior to works commencing during dry conditions.</p>	<p>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.</p>
<p>Watering during operations</p>	<p>The Shift Supervisor is 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:</p> <ul style="list-style-type: none"> 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.
<p>End of Shift watering during dry conditions</p>	<p>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.</p>

<p>Scraper Operations</p>	<p>The Area Superintendent must ensure that machines are of a size approved by TGO for use on site to maximise soil movements whilst minimise vehicle movements.</p> <p>Whilst stripping topsoil and subsoil the Shift Supervisor must ensure that the scraper bowl is not filled to a point where spillage causes dust generation.</p> <p>The Shift 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.</p> <p>During scraper operations in dry conditions, and a 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)</p>
<p>ROM Pad Management</p>	<p>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.</p>
<p>Personnel Health Management</p>	<p>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).</p> <p>Exposure monitoring will be conducted at TGO, dusts such as silica and other airborne dusts will be monitored using:</p> <ul style="list-style-type: none"> • AS2895-2004 Workplace Atmospheres – Method for Sampling and Gravimetric Determination of Respirable Dust • AS3640 – 2009 Workplace Atmospheres – Method for Sampling and Gravimetric Determination of Inhalable Dust <p>TGO will implement the following to control generation of and limit worker exposure to dust:</p> <ul style="list-style-type: none"> • 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.

7. 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.

<p>Caloma</p>	<p>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 speed 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, 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.</p>
<p>Wyoming</p>	<p>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 speed 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, 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</p>
<p>Processing Area</p>	<p>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 speed is to exceed 32 km/h or the wind speed falls below 5km/h conditions are dry Processing shift supervisor is to review operations and contact OP3/Mining Supervisor to arrange for the water cart to pass through the processing area as part of the regular circuit for water application to roadways, COS and other areas of excessive dust generation.</p>

8. 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.
	<p>Suspend operations causing dust generation.</p> <p>Determine the activities that are most likely contributing to the non-compliance;</p> <p>Review the process and current controls in place for these activities; and</p> <p>Implement actions outlined in the pre-emptive Measures Table</p>

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		Mining Manager and or delegate
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 <ul style="list-style-type: none"> • 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. Environmental Current dust deposition status Community complaints status Weatherzone yellow dust alert received		Mining Manager and or delegate Environmental Manager Mining Manager, Processing Manager and or delegate.
Shift Supervisor (or delegate) identifies excessive dust generation from exposed material emplacement areas or other exposed areas.		Mining Manager and or delegate

Trigger		Responsibility
Weatherzone Red alert notification of dust exceedance received via txt message and email		Mining Manager, Processing Manager and or delegate
Water Cart not available		Mining Manager and or delegate
Shift Supervisor (or delegate) considers dust levels leaving the mine lease boundary are unacceptable.		Mining Manager and or delegate
Shift Supervisor (or delegate) considers dust impacting upon the highway within the mine lease boundary may pose a safety hazard to motorists.		Mining Manager and or delegate
Shift Supervisor (or delegate) considers dust accumulating in atmosphere on the mine site is causing unsafe conditions. E.g. poor visibility.		Mining Manager and or delegate

9. COMPETENCE TRAINING AND AWARENESS

All personnel working on TGO will undergo a site 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.

10. 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.