APPENDIX B

DUST SUBMISSION:

January 2010

Environmental Assessment- A Major Project Application 06_0278

Calga Quarry Project: Southern Extension

Calga Peats Ridge (CPR)

Community Group Inc

Written by Dr Terri Thomson MBChB. FRACGP

C/- 12 Pacific Highway CALGA NSW 2250 Email: <u>cprcommunity@gmail.com</u> www: stopsandmine.com.au Facsimile: 02 4375 1172 Ph 0402238553

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EXECUTIVE SUMMARY.

The purpose of this submission is to demonstrate that Rocla Mine has not been diligent in monitoring for airborne small size particulate matter. These small inhalable and respirable particles are relative to Silicosis and silica related disease. There are a significant number of people that may be affected by the inhalation of these particles in the affected jurisdiction.

The Calga Peats Ridge Community Group's objective is to ensure the safety of the Calga, Kariong and Somersby communities. We seek government assistance to ensure that proper dust inhalation data is collected and monitored by an independent commission or government agency to ensure that the community safety against life threatening silicosis, silica related diseases and dust related asthma.

The Group's key recommendations are:

1. Adopt the EPA Victoria Protocol for Environmental Management: Mining and Extractive Industries.¹⁰.

The level of assessment is dependent on the size of the operation as well as the location. The current proposal would be graded for Level 1 assessment, as it will produce>500000 ton a year and is < 500m from some residences.

- a. Monitoring data required prior to conducting air quality assessment:
- b. Level 1- Real time continuous 24 hour PM10 and PM2.5 data for a 12 month period with analysis of crystalline silica PM2.5 fraction.
- 2. Call a moratorium on all new developments until the following points have been *legislated.* (Dr Dick Van Steenis UK industrial air pollution expert.)¹
 - Legislate for PM 2.5 levels to be the monitoring standard in future.
 - Purchase PM2.5 monitors that are accurate to 1%, if not by the State then by the community. Continuous monitoring needs to be done and results made available. This monitoring needs to be done independently from the source of contamination.
 - Legislate for buffer zones, particularly downwind from any new development. Studies in the UK reveal that the Asthma rate is 13% 4.8 km from open cut coal mines.
 - Ensure heavy mining vehicles use high grade Diesel fuel and their exhaust fitted with particle traps.
 - Cover all truck loads.
 - Check all water tanks for contamination and advise accordingly.
 - Tighten Hazardous waste surveillance.
 - Conduct health studies in already affected areas

A health risk study as part of a mine application should be mandatory. As a consequence of not providing a health study there are risks to human health and the possibility of litigation that could prove costly to the taxpayer.

Glossary:

PM- Particulate matter. PM10 < 10ug in diameter,- inhalable.

PM 2.5 <2.5 um in diameter –respirable lodge in the lung tissue and cause silicosis and silica related dieases.

TSP- Total suspended particulate matter.

TWA – Time weighted average, refers to an 8 hour shift.

ACGIH-American Council of Occupational Hygienists.

EA- Environmental Assessment.

NHMRC- National Health and Medical Research Council.

NEPM-National Environment Protection Measure.

NEPC-National Environment Protection Council

NOISH-National Institute for Occupational Health and Safety.

I. INTRODUCTION AND SUMMARY

Rocla is seeking approval from the Minister for Planning to extend its Calga quarry operations to the south, to recover an additional 16.7 million tonnes of sand for a period of up to 30 years. The extension will involve an area of 54.1H or 133.68 Acres, to mines to a depth of between 20 and 30 metres deep. The community views this as a NEW sand mine on a more recently purchased property, which happens to be adjacent to the existing quarry.

The health impacts of exposure to Silica have been well documented and range from Silicosis, Chronic Obstructive Pulmonary Disease, Silica related lung cancer, Pulmonary Hypertension, Autoimmune disorders such as Scleroderma, Systemic Lupus and Rheumatoid Arthritis and Chronic Renal disease.

The Group considers that the Environmental Assessment for Rocla released for public comment on 27th November 2009, reveals several issues that are in dispute.

- The dangerous respirable particles are the tiny parts per million (PM) 2.5 um and smaller. Important also, is the percentage of crystalline Silica contained in these particles.
- Rocla has not been monitoring these, in their existing Quarry. They have only monitored intermittently for surface dust, which has little impact on health. Their statement that PM 10 and 2.5 can be inferred from surface dust levels is **totally incorrect.**
- On one occasion they monitored for PM10 particles for 1 month, when it was raining and the monitors were placed upwind from the source.
- Overseas in USA and UK strict continuous monitoring of PM2.5 particles is required, and the percentage crystalline silica particles within these samples, this is not, but should be a requirement in Australia.
- The Victorian EPA recommendation is 3ug/m3 for areas surrounding sand mines.
- Dust samples from one residence 1km from the existing quarry, showed 80-90% Crystalline Silica less than 10 um, and at another residence 2km from the quarry showed 90% Crystalline silica less than 10 um
- **4** The risks here are unknown as no credible monitoring has been done.
- Rocla Mines environmental assessment is full of misinformation, assumptions and omissions affecting:
 - 36 residences within 1km of the proposed quarry, 10 within 500m and 1 at 270m.
 - The central coast suburb of Kariong is 6km to the east of the quarry and the prevailing winds are westerly. Kariong is home to 6285 people and 900 children attend the primary schools there. (Census 2006)
 - The Walkabout Wild Life Park has around 30 workers, and around 10,000 school children visit the park annually, and their activities will take place about 50m from the proposed mine.
 - Somersby is 5km away and home to 1251 people

Clearly if the state government allows this mine, it could prove to be an election issue for them.

2. Particle Size Matters:

For dust to enter lung tissue, it must be less than 3 microns in diameter.

Mining typically generates dust from 1um to 100um in size, and according to recent research, ranges are:

- \clubsuit submicron size <1um: 0.2% of emissions.
- ✤ PM 2.5: 2-5% of emissions. (Respirable)
- ✤ PM 2.5-10: 15-40% of emissions. (Inhalable)
- \bullet >PM 10: 50-70% of total emissions.¹⁴

The size of the particles also determines the time they spend in the atmosphere:

- PM10 only remains for a few hours,
- PM2.5 can remain there for days and weeks. Consequently these particles can be transported over long distances. ¹³
- The PM 2.5 to PM1 micron particles are the critical ones. The PM 2.5 to PM1 micron particles that are the critical ones from a health perspective. These lodge in the lung tissue and produce a fibrotic and inflammatory reaction which results in Silicosis and is thought to cause an alteration in the immune system.²⁹
- The processes that produce PM10 and Pm 2.5 particles tend to be different, and their levels bear no relation to one another.
- This fact is critical to understanding the uselessness of the Australian dust monitoring systems, which are built around the PM10 levels.
- USA commenced Legislation for PM2.5 levels in 1997 and they have noted a 6% reduction in mortality rates and a reduction in the associated health bill. Canada, Japan and France have followed suit.
- In Australia, morbidity and mortality rates are rising, and the associated health expenses.¹

3. Dust Travels:

• Dust does travel. Children living 1.5 km from a Coal mine have 33% risk of Asthma,

at 3km the risk is 22% and

at 5km it is 12%.¹

Local data:

- The Sydney dust storm of 2009 demonstrates that dust can travel more than 100km
- 4-6 December 2006 at The Walkabout Wildlife Park, 1070m from the existing Rocla Quarry site experienced a thick deposit of dust. The dust samples showed between 50% and 80% Silica less than 10um.²
- Hanson's quarry at Kulnura has been photographed on a still day with Plumes of dust rising to 300m.

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- Dust samples taken from around the Quarry show a predominant amount of particles <2.5um. Dust deposited on the surrounding areas is recirculated by prevailing winds.
- Pit retention is noted to be 5% therefore 95% of dust leaves the site.³
- Rocla states in its 2006 EA for the new Quarry that they predict that they will produce 273494 kg of dust.⁴
 - Dust samples from the existing quarry have shown to be 90% crystalline Silica. Dust plumes rise to 400m from the quarry and the highest concentration of PM10 particles are 10-25 m in the air.
 - Dust samples from our residence 1.2Km from the existing quarry show 80% crystalline silica with particle sizes of less than 10um.

Further afield:

- Quarries in Redlands, Queensland, have been under scrutiny, since Dr Bryan Burmeister a Radiation Oncologist from Princess Alexandra Hospital, Brisbane, has noted a 21% increase in Lung Cancer, around this area, compared to the average Queensland incidence.
- He also lives 4km from the nearest sand mine and has thick deposits of sand on his car.
- 45 tons of silica dust per year are released into the atmosphere by Redlands Quarries.
- The Barro Group Pty Ltd lost their appeal in the Planning and Environment Court, against Redland Shire Council, in 2008 to proceed with their Quarry development.¹¹
- 2002 Dust storm that hit Canberra coming from the North West, particle size averaged 26.6um and 9.4% was < 2 um. Dust samples in 2002 showed 40% sand, and in 2005 35% sand.²
- <u>So deposited sand does remain</u>
- A study in USA, showed that at 100m from a quarry median particle size is 24ug, and PM10 or less comprised 11-23% of the dust emissions.
- The NPI estimated that the mass PM10 emissions due to coal mining in the Hunter 2003-2004 was 42,000,000 KG.
- A more recent study in the Hunter Valley showed that soil particles make an average contribution to the fine particles in the atmosphere, 10% for PM2.5 and 22% for P10 size fractions.¹⁴
- Bhagia in 2009 demonstrated PM10 particles at 5 km from a source at concentration of 3.51ug/m3, and PM10 round the vicinity of the mine 41.07 57.22ug.m3.²⁵

4. Rocla Mines Data

- **W** The data on pg 4-11 of the EA is incomplete, and contains errors.
- Data for Hunt, Lawler and Lambert residences has been omitted- there is in fact a residence at the Lambert property. (Error pg 4-15)
- **Where is no data given for proximity to Popran and Brisbane Waters National Parks**
- **4** Data for the Soulis residence is incorrect as the house is nearer, only 600m from stage 5.
- On pg 5-153, yet another "scenario" has been created: Table 5-40 there are numbers but no units. Could this be tons, kgs or ugms?
- Further errors on page 4-13 and 4-14: contradict the fact that both the Kashouli and Rozmanec Farms have wound down farming/ nursery business due to significant decrease in bore water yields since the Stage 3 Quarry extension.

5..Residences at risk:

- There are 36 residences in the area all under 2km radius of the proposed extension, with 20 school children in this area. There are 10 residences that will be within 500m of the Quarry sites, one as close as 270m.⁵
- The Walkabout Wild Life Park has over 30 workers and around 10,000 school children visit the park for educational studies in Aboriginal studies and the environment per year, and their activities will take place about 50m from the proposed mine.
- The Central coast suburb of Kariong is 6 km to the east of the quarry and is home to 6285 people.
- There are 900 children that attend the primary schools. The prevailing winds are westerly, thereby blowing the dust directly to Kariong.
- Somersby is 5km north east and home to 1251 people.

The quarry is becoming a contentious election issue for the State government.

6..Monitoring Standards:

- In the US the NIOSH recommended 50ug/m3
- ACGIH recommends 0.25ug/m3 as the maximum allowable concentration for respirable silica. ¹²
- The ARB California has in 2002 adopted new revised standard, lowering the annual PM10 standard to 20ug/m2 and establishing a new annual standard for PM 2.5 of 12ug/m2. Ongoing monitoring of this is required. ¹⁸

The NEPC has made the Air Quality NEPM review standards, and add an advisory reporting standard for PM2.5. The issue is that " the current approach to monitoring, focussed on compliance with air quality standards, is not consistent with international trends to reduce exposure to these pollutants irrespective of whether the air quality standards are met or not."

• WHO guidelines for particulate matter are:

PM10: 20ug/m3 annual mean.

50ug/m2 24 hr mean

PM2.5: 10ug/m3 annual mean

25ug/m3 24hr mean. 23

- The Victorian EPA has developed a protocol for *a PM2.5 3ug/m3 limit for crystalline silica in areas surrounding mines and extractive industries*
 - NO ONE CAN ESTIMATE the true emissions impacting the residents in the area surrounding the Rocla mine without any form of monitoring for these particle sizes, let alone the current world standard requirements for continuous monitoring.

7. Rocla Monitoring Results:

- -Rocla occasionally monitors for surface dust particles, not even continuously, this is just nuisance dust.
- Particle < PM10 are inhalable, but the ones that go deep into the lung are < PM4. To date contrary to the recommendation of overseas data PM<4 have not been monitored.
- -The statement that PM10 and 2.5 levels can be inferred from TSP or surface dust levels is *totally incorrect.*¹
- -Rocla has only monitored for PM 10 particles continuously using DustTrak from May15/5/07 to 1/6/07.

Rocla Mines used a High Volume Air Sampler to monitor PM 10 every 3 days from 4/2/07-28/2/07, ie 9 days and from 2/8/07 to 27/8/07 only for 5 days.^{6.} This data is insufficient and irresponsible.

• referring to the Bureau of Meteorology observations for all the above dates, it was raining before or during monitoring, for most of the days, and the monitors were placed up wind from the prevailing breezes.⁷

To present figures of continuous PM10 monitoring for 12 months from **Richmond** (EA pg 5-146) 50Km southwest of the proposed Quarry site is **NOT acceptable**!

• Getex monitored dust from bulldozers and trucks on 28/4/08 and 16/6/2008 and on both occasions the pump failed due to excessive loading of dust in the filter. It would be good if they repeated this when the pumps were working.⁸

However interestingly the 2 reports appear to have *conflicting* results:

- April 2008 ' all respirable Silica results were well *above the indicative levels of* 0.1mg/m3 taken from the Australian Safety and Compensation Council Exposure Standard' and 'The results indicate that *the percentage of Quartz in Respirable Dust is high with a minimum content of 85% being recorded'.*
- May 2008: 'All respirable silica results were below the adopted indicative levels of 0.1mg/m3'...and 'The results indicate that the percentage of Quartz... had a maximum level of 6%.....and indeterminate in one sample... due to both the mass of Quartz and the weight of dust being below minimum detection limits'
- The only conclusion from this is that some of the dust has high silica content; values will vary according to the site source and time of exposure.

Monitoring that reflects community exposure is imperative in order to estimate any potential risk to the community.

The Victorian EPA recommendation is for a limit of 3ug/m3 PM2.5 particles for areas surrounding sand mines.²⁰

Rocla states that the lifetime cumulative risk for silicosis at or below 1000ug/m3 or 14.4ug/m3 per year for 70 yrs is 0%. This article also states that this may be true but only when the PM10 is kept at or below 50ug/m3.

Also Silicosis was under diagnosed on Radiographs, as 61% of 326 cases had slight to marked silicosis at autopsy.(US EPA 1996).²⁴

8-Reasons for minimising emissions of PM 10 and 2.5:

• WHO Europe:

Long-term exposure to PM 2.5 results in a substantial reduction in life expectancy; PM 2.5 shows the strongest association with mortality, indicating a 6% increase in deaths from all causes per 10ug /m3 increase in long-term PM2.5 concentration. The estimated relative risk amounts to 12% for deaths from cardiovascular diseases and 14% for deaths from lung cancer per10ug/m3 increase of PM 2.5.¹³

• Australia has the 3rd highest incidence of Asthma in the world, and it is rising. It stands at 1 in 4 Primary school children, 1 in 7 teenagers and 1 in 10 adults. These are people that are

profoundly affected by air pollution and dust particles. Asthma is virtually non exsistant in remote Aboriginal communities.²⁶

- It has also been found that negative health impacts, in the Australian setting occur at lower levels of outdoor pollution than expected.²⁷
- Park et al 2002, estimated a lifetime risk for Radiographic Silicosis of 68-75 cases per 1000 workers exposed to 50ug/m3 silica for a 45 yr work life.¹⁹ Others have documented between 10 and 30 cases per 100 workers for the same exposure.²⁹
- WHO suggest that to prevent ill health levels for long term exposure to PM10 should be < 20 ug/m3 and this will lower the amount of deaths by 15%. ²³
- Silicosis is still being diagnosed at death in workers that have been exposed to occupational levels of 50-100 ug/m3.²⁰
- -Steenland and Brown have reported a lifetime (75yr) risk of silicosis of 35-40% in workers exposed for a working lifetime, 45yr, at levels of 99ug/m3. i.e for every 100 workers there will be 35-45 cases of silicosis by age 75.²⁰
- Mannetje et al. 2002 reported that the mortality risk for 45 yrs of exposure is 13 deaths per 1000 workers at exposure rate of 100ug/m3 and 6 deaths per 1000 workers at 50ug/m3 exposure. *These are the exposure levels that Rocla states as occupational Criteria for Quartz. Pg 5-150 fig 5.39.²⁰*
- Silicosis risk (Tran et al.2005) suggests that **for every 100 workers exposed for 15 yrs at the Australian TWA limit there will be 248 cases of silicosis after a further 15 yrs**. Tran also observed that "...Silicosis is a progressive damage process, and there is no clear diagnostic point past which disease is discriminated from absence of disease, except by arbitrary convention..."²⁰
- The question of non occupational silica related disease needs further evaluation. Particularly interesting are studies of farm animals raised downwind of sources of respirable silica dust, have shown silicosis at autopsy. Of note are four 1 year old pigs that were confirmed with silicosis, on analysis of tissue samples.²⁰

WHO (2007) "it should be kept in mind that when silicosis is detected by a chest X-ray, it is already too late, that lung will never be normal again.."

- Study by Holmen and Shiraki 2001, showed that crystalline silica concentration were significantly elevated downwind from a sand and gravel plant, as were both PM10 and 2.5.²⁰
- -The Victorian EPA has developed a protocol for *a PM2.5 3ug/m3 limit for crystalline silica in areas surrounding mines and extractive industries.* This level would protect communities in these areas but this would need to be a total exposure limit and include ambient levels as cumulative exposure due to all other sources in the area.²⁰
 - NHMRC reported (2006): ". air pollution has the potential to affect everyone in the community, and the individual cannot readily control the extent to which they are exposed to airborne pollutants, there is a reliance on governments to ensure that appropriate levels public health protection are enacted through air quality standards..." 20

- In June 2005, the Senate of the Commonwealth of Australia voted to establish an inquiry into workplace harm related to toxic dust exposure, known as "the White" Inquiry. A paper by Faunce et al, critically analyses the results and the role of the then newly formed ASCC (Australian Safety and Compensation Council), and concludes that:
 - 1. ASCC should recommend the numbers of occupational health and safety inspectors capable of enforcing the new national standards.
 - 2. Address evidence from this inquiry that workplace exposure present a much greater risk to the Australian community than is currently recognised. Community exposure to wind-borne dust and rainwater has been insufficiently investigated.
 - 3. There is no credible research to date (2006) on the health impacts of nanoparticles, despite the increasing use of such technology in Australian industry. This data and regulatory gap must be filled.²²
 - As stated by Dr Phil Cantrell (Work cover) "Silica dust cannot be regarded as nuisance dust, it is a hazardous material." *Asbestos and Silica have the same risk ratio-1:4* (risk of lung cancer after exposure).²¹

9.Silicosis and Silica related disease:²⁹

9.1 Silicosis:

There have been several hundred studies that have conclusively linked quartz dust exposure with silicosis. Silicosis is a progressive fibrotic lung disease, which is disabling and can be fatal.

Analysis of tissue samples has determined that quartz is the only significant indicator of silicosis severity.

Radiographic Silicosis increases with increased average silica dust exposure, cumulative quartz exposure and duration of exposure.

- Chronic Silicosis usually develops after 10 or more years of exposure at relatively low concentrations.
- ✤ Accelerated Silicosis, develops 5-10 years after first exposure.
- ✤ Acute Silicosis, which develops after exposure to high concentrations of respirable crystalline silica and results in symptoms in a few weeks, or 4-5yrs after exposure.

9.2 Lung Cancer:

There are numerous reports relating lung cancer to occupational silica exposure, and the risk increases with cumulative exposure and duration of exposure.

9.3-Pulmonary Tuberculosis:

The association between Tuberculosis and silicosis has been firmly established.

9.4-Auto-Immune Diseases:

In humans, immune activation by exposure to respirable quartz may trigger auto immune related disease in statistically significant numbers: Scleroderma, Rheumatoid Arthritis, and Systemic Lupus Erythematosis. Cases of Polymyositis, Dermatopolymyositis, Autoimmune Haemolytic Anaemia and Chronic Thyroiditis have also been reported.

9.5-Renal Disease:

There are statistically significant associations between exposure to silica quartz and renal disease.

9.6-Chronic Obstructive Pulmonary Disease:

Includes Bronchitis and Emphysema and occurs in non smokers exposed to quartz.

9.7-Complications of silicosis:

Cor Pulmonale- Right Heart failure, and Pulmonary Hypertension.

9.8 Other adverse Health effects that have been reported:

Naso and oropharyngeal cancer, salivary gland, liver, bone, pancreatic and liver cancer. Also gastrointestinal and bladder cancer and haematological malignancies.

10. Cost to Society and Compensation:

Dust Diseases Report 2008-2009:⁹ outlines compensation payments 2008-2009: Asbestosis- 7882 Silicosis -3760 Silica/Lung Cancer- 41

Deaths since 1968 in people with : Asbestosis- 698

> Silicosis -1387 Silica/Lung Cancer- 29

NOTICES has been given that the Work Cover Authority, in pursuance of section 6 of the Workers' Compensation (Dust Diseases) Act 1942 ("the Dust Diseases Act"), has determined that the 2009-2010 financial year interim contribution to be paid by an insurer to the Workers' commencing 15 July 2009 will be as follows:

Insurer Contribution Amount:

Workers Compensation Nominal Insurer \$73,200,000

Catholic Church Insurances Limited \$1,068,533

State Cover Mutual Limited \$376,231

Guild Insurance Limited \$190,610

Racing NSW \$12,328

Hotel Employers Mutual Limited \$116,000

Price Waterhouse Coopers has been requested by the Dust Diseases Board to estimate outstanding claims liabilities of the Board under the Workers Compensation Act as of 30 June 2009: **Their general estimate is \$1616.0m.**

11. Augmentation of the problem-premature felling and lack of successful rehabilitation.

- EA pg 2-16 states that land will be cleared 6-12 months in advance.⁵ This will greatly enhance the dust problem. However in the Statement of Commitments, pg 6-13, 11.1 states that they will minimise clearing ahead of extraction activities. Which will it be?
- Levels of dust from removal of vegetation and top soil and removal of overburden material as well as transport are responsible for major dust emissions.¹⁴
- Further important control is keeping disturbed land to a minimum, by progressive rehabilitation.²⁸
- To date in the existing quarry no successful rehabilitation has occurred. So currently exhausted mines remain unsealed.

12. Recommendations:

1.Adopt the EPA Victoria Protocol for Environmental Management: Mining and Extractive Industries.¹⁰.

The level of assessment is dependent on the size of the operation as well as the location. The current proposal would be graded for Level 1 assessment, as it will produce>500000 ton a year and is < 500m from some residences.

a. Monitoring data required prior to conducting air quality assessment:

b. Level 1- Real time continuous 24 hour PM10 and PM2.5 data for a 12 month period with analysis of crystalline silica PM2.5 fraction.

2.Call a moratorium on all new developments until the following points have been legislated. (Dr Dick Van Steenis UK industrial air pollution expert.)¹

- Legislate for PM 2.5 levels to be the monitoring standard in future.
- Purchase PM2.5 monitors that are accurate to 1%, if not by the State then by the community. Continuous monitoring needs to be done and results made available. This monitoring needs to be done independently from the source of contamination.
- Legislate for buffer zones, particularly downwind from any new development. Studies in the UK reveal that the Asthma rate is 13% 4.8 km from open cut coal mines.
- Ensure heavy mining vehicles use high grade Diesel fuel and their exhaust fitted with particle traps.
- Cover all truck loads.
- Check all water tanks for contamination and advise accordingly.
- Tighten Hazardous waste surveillance.
- Conduct health studies in already affected areas

A health risk study as part of a mine application should be mandatory. As a consequence of not providing a health study there are risks to human health and the possibility of litigation that could prove costly to the taxpayer.

13. Proposed conditions of consent:

Should the mine be approved-(a result that the Group does not support), the Group considers that there should be sufficient conditions placed on the operations of the mine to ensure that the mine operates in a manner that minimises the risk to human health as a result of dust emissions. We recommend that the following conditions be included as part of any approval:

13.1-Policing of the conditions:

The Department of Environment, Climate Change and Water is to provide the staff necessary (with appropriate qualifications) to act as the point of contact and as the inspector of the mine.

Inspections are to be carried out once per month (minimum). Where a complaint is received, the inspector is to be able to visit the site within 3 hours to witness any breach of the conditions.

13.2 -Bond/trust fund:

The conditions are to include requirements to set up a fund or bond system to ensure that all the conditions can be fully carried out (including the final landscaping of the mine) regardless of whether the mine continues operation or goes unexpectedly out of business or is sold to another operator.

The fund should also cover the ongoing control of erosion of the fine dust (filter cake) that will occur in the decades following the close of the mine.

13.3-Monitors to be installed:

Monitors are to be installed and maintained as follows:

- Deposited dust monitors capable of giving readings per day.
- Fixed fine particle dust monitors-PM2.5 capable of giving a reading per day.
- 10 to be placed around the mine. And others on all neighbouring properties.
- Noise monitors capable of giving readings of instantaneous noise levels.
- Truck barcode readers are to be placed at the entrance to the mine to record the incoming and outgoing truck movements.
- Water level monitors to be installed in any bore as requested by the owners of surrounding properties within 5km of the boundary of the mine.

13.4-Gazetting monitored data:

All monitoring equipment is to be directly electronically connected to a web site set up by the Dept of Environment and Climate Change and the readings are to be updated in real time. The web site is to be available to any member of the public for access to the whole of the data.

This is to provide for proper supervision to be carried out of the level of compliance of the mine with the approval conditions.

13.5-Replacement of lost water

Where there is loss of water resources on neighbouring properties the mine owners are to install an adequate water supply and reticulation system to supply all the properties in the area that have been affected.

Dr Terri Thomson. MBChB. FRACGP.

14-References:

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2-SAG Power point Presentation to Independent Panel March 2009.

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6- Rocla Sand Quarry 2007 Annual Environmental Report.

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8- GETEX Respirable Dust & Silica Monitoring Reports: 28/4/08-3096.01.DMON and 16/5/08-3096.02.DMON.

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