Rocky Hill Coal Project
Application No. SSD 5156

I oppose this proposed development.

Rocky Hill & the Mograni Range viewed from Waukivory Rd

My wife and I are residents of Gloucester NSW. Gloucester, which is an idyllic and peaceful rural township and district, currently has the Yancoal Stratford coal mine operating some 12 kilometres south of Gloucester. There is also a mine extension application awaiting determination. Further, the first stage of the AGL Coal Seam Gas (CSG) development has been approved with up to 110 wells proposed in this stage. This first stage, should it proceed, will sit in the Gloucester Valley, including the Avon River flood plain.

Gloucester Resources Ltd's (the Proponent)'s Environmental Impact Statement (EIS) for its Rocky Hill Coal Project (the Proposal), DA No. SSD-5156, is now on public exhibition and **I oppose this proposed development**.

Background

The town of Gloucester sits in a valley between two generally north-south running mountain ranges; the Bucketts Range to the west and the Mograni Range to the east. Rocky Hill is a feature of the Mograni Range and is shown in the first photo.

The Gloucester Valley was first explored by the Australian Agricultural Company (AA Co) and the land covered by this development application is entirely within the area described in 1826 by explorer Robert Dawson as the Vale of Gloucester. In 1976 the Vale of Gloucester was registered on the National Estate and in 1981 the National Trust of Australia (NSW) described the Vale of Gloucester as running from Barrington to Stroud Road. In May 2010 the Gloucester Shire Council supported investigation and lodging of paperwork to have the Vale of Gloucester placed on the National Heritage List.

As mentioned previously, the Gloucester Valley already has what was to be Gloucester Coal's 'boutique' coal mine with a limited life. Gloucester also has AGL's Gloucester Gas Project approved but as yet not operational. Further, the Yancoal Duralie mine is impacting the Vale of Gloucester only a few kilometres north of Stroud Road.

View of the Bucketts & Avon Valley from our western boundary

Justification for my opposition to the Rocky Hill Coal Project (the Proposal)

VISUAL

A Key Issue in the Director General's Requirements (DGR) requiring attention is the *"potential visual impacts of the Project on private landowners in the surrounding area"*. We bought this property after having been shown the view from the western boundary. See the photos below and on page 2. With such a vista, why wouldn't we choose to live here? We enjoy taking friends to this area with its outlook over farming lands and on to the Bucketts Range. We now show this same view with the rider "but soon this may feature an open cut coal mine".

View over the Avon Valley from the highest point on our property

The above photo, taken from a more northerly point on our western boundary, shows a cleared area in the near – middle distance with a horizontal line of trees immediately behind it. This line of trees runs beside what is presently McKinley's Lane. All of this visible cleared area and more, almost up to Waukivory Rd, is destined to variously hold overburden (EIS figure 2.1) or subsoil (EIS figure 4.12) and the eastern visibility barrier which will be up to 36 metres above natural ground level (EIS 2.3.4, 2-17).

The overburden on this land is destined to remain until after the end of mining operations when, as stated in EIS 4.5.6, 4-137 . ." *recontouring the area of the former Main Pit using*

material from the interim overburden emplacement east of McKinleys . .” will take place. I wouldn’t expect the Proponent to have considered the Proposal’s visual impact from our vantage point but we will certainly be impacted. We will see a visibility barrier 36 metres high which would completely block out the McKinley’s Lane tree line and much of the grazing land beyond.

If this mine is approved then our view will be marred with piles of subsoil/overburden and a very visible and unsightly ‘visibility’ barrier, barely one kilometre from our boundary, in an area dedicated as Environmental Management. We always expected farming practices would be part of this vista but open cut mining was never anticipated. Although the Proponent intends to rehabilitate the site to something resembling the present it will be long after our time here. We have no option but to try and sell up.

In offering the property for sale we feel obliged to mention that this proposed mine, should it eventuate, will be prominent in what is an otherwise delightful view. Our property value is therefore already considerably compromised and more difficult if not impossible to sell at a realistic market price.

Trees bordering McKinley's Lane with Rocky Hill in the background

A further visual problem is the appearance of the visibility barriers when viewed from the various vantage points chosen for the EIS. Although the photo on page 4 was taken from Waukivory Rd, it clearly shows the line of trees bordering McKinley's Lane from a point close to Waukivory Rd and running south. The eastern visibility barrier will be on the immediate far side of these trees and with a height above natural ground level of up to 36 metres. The EIS states (4.5.6, pg 4-137) *"the northern section of the eastern visibility barrier would be predominantly screened by vegetation within the McKinley's Lane road reserve which is up to 25m in height"*.

It is obvious that, from this viewing point at least, the eastern visibility barrier will obscure a considerable part of the lower slopes of the Mograni Range. The subsoil is likely to be a pale grey colour as evidenced by the Stratford mine overburden bund clearly visible from the Bucketts Way. Vegetating the western slope of this and the other visibility barriers will be difficult even with a covering of topsoil. It would be almost impossible to recover the topsoil used on this and other visibility barriers for final landform use resulting in little topsoil available for the final remediation.

AIR QUALITY

Another DGR key issue is air quality. My concern regarding air quality is the potential health impact that polluted air will have. Clean air is a basic human need and therefore of utmost importance. Dust generated at the Site will of course be carried by the wind with the larger particles falling to ground relatively close to the Site while the finer particles will travel further afield. The finer the particles the further distance they will potentially travel and it is these finer particles, PM_{10} and particularly $PM_{2.5}$ and smaller, which are the most critical to human health and therefore of most concern.

Wind speed and direction at the Site and downwind will dictate the distance the airborne particles will travel and where their impact will be felt. In my opinion the statement in 4.1.3.6 at the foot of page 4-9 is contradictory as it says *"Wind roses displayed on Figure 4.4 indicate that on an annual basis, prevailing winds are from the northeast and south".*

The statement continues with *"Seasonally, the winds from*

- *The northeast and south dominate during summer*

- *The south dominate during autumn*
- *The southwest to south-southeast dominate during winter while*
- *During spring, winds are much more variable and not dominated by any particular direction.*

These patterns reflect the influence of the north-south orientated topography has on the wind directions throughout the Stroud-Gloucester Valley."

My interpretation of the wind rose graphs (EIS fig 4.4, 4-10) does not agree with the first sentence, that *"prevailing winds are from the north-east and south"*. The graphs show that during spring the winds have no particular direction, during summer there is a pattern of wind from the north-east and also south and during autumn and winter the wind is predominantly from the southern quarter. This is as pointed out in the above seasonal wind patterns. It should therefore follow that the various TSP concentrations graphs and dust deposition graphs would reflect a composite of these seasonal winds. However graphs such as the Annual TSP Concentrations graph (EIS figure 4.23) and the Predicted Maximum 24-hour Average PM_{10} Concentrations graph (EIS figure 4.24) are favouring winds from the north east which is relying on the incorrect *"prevailing winds are from the north-east and south"* statement. Therefore these dust deposition and PM concentration graphs are incorrectly skewed away from Gloucester Township. Winter temperature inversions will compound the problem to the north of the Site.

A complicating factor for my wife and me is that our property is in a small north-west/south-east aligned valley that joins into the Avon Valley adjacent to the proposed overburden dump and close to the entrance to the proposed mine site. At various times of the year and particularly late winter/early spring we can have gentle breezes ranging through to near gale-force winds whistling up from the Avon Valley flood plain. Any such winds will have the capacity to transport dust from the mine site and overburden dump right over our property and I expect a heavy concentration of particulates during those times. The various annual and 24 hour concentrations and dust deposition graphs should have shown lobes trending further south-east along Waukivory Rd.

The EIS assessment of Air Quality was undertaken by Pacific Environment Limited (PEL) with Toxikos, a division within PEL, compiling a Health Risk Assessment. The conclusion to Air Quality seems to be dealt with at EIS 4.4.9.5. This conclusion focuses on *"the potential acute and chronic health risks of increased levels of $PM_{2.5}$ and NO_2 . . are negligible or acceptable"* To dismiss airborne particulates as simply *"$PM_{2.5}$ and NO_2"* is failing to address a specific requirement of the Director General for a focus on diesel emissions. To quote Key Insights *"Diesel particulates are known to cause irritation and are considered a probable human carcinogen . ."* and again *"Known health effects of particulates include upper respiratory tract irritation and infection, decreases in lung function and the exacerbation of symptoms and increased mortality from cardiovascular disease"* and finally *"Populations that are most vulnerable include elderly people with existing respiratory and cardiovascular disease and young children with asthma".* (SCSC Vol 4 part 14, 5.2.1).

Key Insights may consider diesel particulates to be only a *"probable human carcinogen"* but the WHO describes them as **a class one carcinogen**. The Proponent's Coverage of DGR's (Appendix 3) states these emissions are covered in the EIS at 4.4.6 and 4.4.8, but nowhere in 4.4.6 is diesel mentioned and in 4.4.8, diesel is only mentioned in table 4.41 as a CO_2 equivalent greenhouse gas. I believe the EIS has failed to fully address the Director General's Requirements.

No-one is suggesting that people will be dropping dead in the streets. What is likely is that people living or working in the area of impact who are susceptible to airborne pollutants will suffer more frequent and more severe episodes of breathing difficulties and perhaps reduced quality of life and even reduced longevity. We and many other people are in the 'vulnerable' category as mentioned by Key Insights.

NOISE POLLUTION.

A further DGR key issue is noise. The EIS, (4.2.1 pg 4-19, noise - introduction) ranks the potential impact *of "Noise emissions from mining operations impacting amenity (including site establishment and construction phase)"* as **high,** or as described in the NSW Industrial Noise Policy (INP), section 2, this is *"a high-risk development"*. However this same introduction ranks *"Noise emissions from mining operations impacting health"* as **low**. Standard mitigation measures or not, in the Overview of the INP it states *"The adverse effects of noise on*

communities are well reported . . .These vary from direct effects to indirect or secondary effects, such as long-term annoyance and prolonged disturbance to sleep". The INP says "*Community reaction to noise has been noted as a likely indirect cause of adverse health effects (Job 1996)"*. A specific INP objective is *"to establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses".* Therefore the INP confirms the desire for quiet and the need to protect the community from excessive intrusive noise.

Another source of information on sound and noise is Brüel&Kjær (B&K), a long established Danish firm with over 70 years experience in sound and noise measurement. B&K, in its own terms, is "the market leader in solutions for professionals in the field of environmental noise and noise in the workplace". Reference will be made to B&K's booklet 'Environmental Noise' in this section of my submission as well as other noise-related documents .

To quote B&K, the *"European Union's Green Paper on Future Noise Policy (1996) estimates that, in terms of the number of people affected by noise, 20% of the [European] population suffer from unacceptable noise levels that cause sleep disturbance, annoyance and adverse health effects."*

EIS Section 4.2.2.1 describes current variously attributable noise audible at residences surrounding the Site including traffic, trains, domestic noise, rural noise, wind in the trees, livestock nearby and at the saleyard, a sawmill and aircraft. Nearly all of these noise sources were expected and are of negligible consequence to us however train noise needs special mention.

Trains on the North Coast Rail line are sometimes audible. Although the rail line is some five (5) kilometres west of our house there are days when trains, although not loud, are clearly audible outside the house and occasionally audible inside. This happens when the wind is calm or a gentle breeze is blowing from the Avon Valley up through our valley. Waukivory Road ascends the Mograni Range and into our valley through a natural cutting made by Oaky Creek. An example of rail noise was in the early morning of Friday 30th August 2013 where a brief shower of rain had woken me at about 5.15 am and that rain event was followed by a train, audible whilst I was still in bed with the window closed at about 5.20 am. Particular

reference is made of the audibility of train movements as evidence of the potential noise impact from mine workings. The proposed overburden dump and mine pits are in the same general direction as the rail line with the overburden only 1200 metres from our house and the Weismantel pit as close as 2 kilometres, all considerably closer than the rail line.

Wilkinson Murray (WM) (SCSC Vol 1 Pt 1, 5.2, Assessment Methodology Pg 1-54) describes various changes or increases of noise level saying a change of <1dBA is "*not noticeable*", 1 to 2dBA is *"not noticeable by most people",* 3 to 5dBA is *"not noticeable by some people but may be noticeable by others"* while >5dBA is *"noticeable by most people".* In contrast B&K graphs the Perception of Sound and describes a 1dB change in sound level (either louder or softer) as *"the smallest perceptible change"*, a 3dB change as being *"noticeable"*, a 6dB change as *"obvious"* while an 8-10dB change is *"significantly louder".* Although these perceptions are subjective, WM's noise tolerance listing suggests less 'noticeability' or impact for the same noise level increase than B&K's list. My understanding of sound and acoustics is that changes in noise level of 5dB would certainly be a noticeable, conscious and perhaps an intrusive change in the noise environment.

EIS figure 4.9 shows 16 noise monitoring locations around the Site and Gloucester with table 4.4 listing the measured background noise levels at those locations. It is noted that all of the locations registered an evening background noise level of 30dB(A) or lower and night background noise levels of 27dB(A) or lower. The monitoring point closest to our house is location 1 which, in table 4.4, shows day, evening and night Rating Background Levels (RBL) as 30dB(A), 28dB(A) and 27dB(A) respectively.

Although I presently have no means of proving otherwise I challenge these location 1 readings based on the readings recorded at monitoring point 3 which are 26, 25 and 22dB(A) respectively and monitoring point 10 (31, 27, 25dB(A)). Monitoring point 10 appears to be within the Thunderbolt's Estate and I know no reason why RBL's at our house would be higher than those recorded at monitoring point 3 or 10. Whether the location 1 readings should more closely reflect the readings at monitoring points 3 or 10 or not, I am confident RBL's measured at our house would be considerably lower than those recorded at monitoring location 1. Despite this the INP says a RBL of 30dB(A) must be adopted as a minimum.

During site establishment and construction, evening operations differ from daytime with a reduced fleet operating, what ever that means. It appears to be left to the Applicant to decide the number and type of equipment operating of an evening (EIS 4.2.5.2. pg 4-32). The D11 dozers can still operate unless there is a certain combination of adverse wind speed, temperature inversion or both in play (EIS table 4.9, pg 4-30). The drill can still operate in areas shielded to the north and west which leaves the noise unshielded towards our house.

During the operational years, the evening noise reduction is to be achieved by reduced fleet operation and not operating the rubber tyred dozer if adverse wind speed and temperature inversion or both are in play. At night, the noise reduction is to be achieved by reduced fleet operation (EIS table 4.11, pg 4-33). EIS table 2.7, pgs 2-55,6 shows during years 2 – 14 there can be up to the following in operation at night:- 2 rotary drills, 5 excavators, 13 haul trucks, 1 grader, 1 front end loader, 3 dozers, 2 water carts and 1 bobcat. Individually the noise level given for these machines ranges from 118dB(A) to 107dB(A) (EIS table 4.13, pg 4-37) with most at or above 112dB(A). I expect these noise levels are arbitrary as, for example, large rocks being dumped into a haul truck or excavators scraping on a solid rock base may create a somewhat higher noise level.

Although there is reference to a cumulative noise level during mine operation phases, (EIS 4.2.6.3, 4-36), no actual cumulative figure is given. WM suggests a level during construction of the rail load-out facility of 122dB(A). It is reasonable to expect a cumulative noise level during all construction and mining operations to be somewhat higher than that of the rail load out construction as there would likely be more machines operating. B&K discusses the addition (and subtraction) of sound levels. In the simplest of terms, every doubling of similar noise sources gives a 3dB increase in sound or noise level. With the possibility of up to 24 pieces of equipment operating at night during years 5 – 8 (EIS table 2.7, pgs2-55,6) with individual noise levels ranging between 107dB(A) and 118dB(A) it is quite possible the cumulative noise level would be well above 122dB(A). B&K describes 0dB as the threshold of hearing and 130db as the threshold of pain.

I am at a loss to understand the logic behind the statement that *"tonal, impulsive and low frequency noise are unlikely to be a feature of the Proposal given the management measures proposed, and hence no additional mitigation measures are required for those noise sources".*

(EIS 4.2.5.3). The noise management measures appear to be nothing more than earth barriers, in-pit operations, 'quiet systems' and working a reduced fleet in the evening and night. Further discussion of impulsive and low frequency noise follows.

Sleep disturbance. Avoiding sleep disturbance is very important and should be a stated compliance requirement. I am alarmed at the manoeuvres in the SCSC (Vol 1 Pt 1 Section 5) attempting to dumb down the guidelines on noise and particularly sleep disturbance. A specific objective of the INP is *"to establish noise criteria that would protect the community from excessive intrusive noise".* With the previously mentioned night-time fleet operation, being quite subjective in its implementation, there is a real potential for sleep disturbance. Whether the operational cumulative noise level is 122dB(A) or some other level is yet to be determined. The SCSC (Vol 1 Pt 1, 5.4 WHO Criteria) discusses WHO Guidelines for Community Health and arrives at a $L_{Aeq,\ 8hour}$ figure of 35dB(A) internally for speech intelligibility and 30dB(A) inside bedrooms for sleep. On this same matter the WHO website asks *"How loud is too loud?"* and continues with 30dB(A) in bedrooms and 35dB(A) in classrooms but doesn't use the '8 hour equivalent' descriptor. The WHO may mean 30 and 35dB(A) are maximum noise levels in these circumstances. In contrast the EPA's Sleep Disturbance Criterion is that "*the $L_{A1,1minute}$ noise level (which is approximately the maximum noise level) from any activity should not exceed the RBL by more than 15dB(A) when measured or computed at the location of a building façade"* (EIS 4.2.4.4 pg 4-26). This means that, using the adopted night-time RBL of 30dB(A) measured outside, the EPA's sleep disturbance criterion, would be 45dB(A)$L_{A1,\ 1\ minute}$, again measured outside.

The EIS then continues (4.2.4.4) with *"This level, [45dB(A) $L_{A1,\ 1\ minute}$] on the outside of a residence, is equivalent to an inside noise level of <35dB(A).* This last statement appears to be based on WM's assumption of *"a 10dB attenuation from outside to inside with windows partly open"*. There appears to be no reference to this last statement in the INP. WM notes the WHO assumes an outside to inside attenuation of 15 – 21dB, presumably for European conditions, and suggests a 10dB outside/inside attenuation is more suited to Australian conditions. This 10dB attenuation assumption (EIS 4.2.4.4 pg 4-26) can not be substantiated.

To describe a level at the house façade and then deduce an attenuation of at least 10dB inside the house is simplistic. In some types of house construction the outside/inside

attenuation with the doors and windows closed may exceed 10dB or even 20dB however the actual noise attenuation is dependant on the roof, floor and wall construction, the door and window type and how well they seal when closed and whether the windows and doors are open or closed at the time. During winter we sleep with windows and external doors closed but in summer they are usually all open. In our house at least, there will be negligible outside/inside noise attenuation with doors and windows open. With the night-time RBL of 27dB(A) measured at monitoring point 1 and an expected RBL at our house of 25dB(A) or less, this means the sleep disturbance criterion, measured at the façade of our house, should be no more than 40dB(A) $L_{A1,\ 1\ minute}$ before any modifying factors are applied.

As mentioned earlier, the EPA's Sleep Disturbance Criterion is that "*the $L_{A1,1minute}$ noise level (which is approximately the maximum noise level) from any activity should not exceed the RBL by more than 15dB(A) when measured or computed at the location of a building façade".* I'm not sure whether even this criterion is stringent enough. Firstly, a measured background level at a particular receptor may be more than 10dB lower than the assumed RBL of 30dB(A) and secondly, sleeping habit changes from summer to winter (windows and doors open or closed) have not been considered.

Regarding sleep disturbance, my point is this:- a background noise level in the bedroom whilst a person is asleep could well be in the order of 20dB(A) or lower. A low frequency noise of amplitude 45dB(A), measurable at the house façade would, according to the EIS Sleep Disturbance Criteria, appear to be below the Sleep Disturbance threshold. If the house structure has little or no noise attenuation or the windows or doors don't seal well or are open then the noise level inside the room could well be 40dB(A) or higher, which is considerably higher than the room background noise level resulting in disturbed sleep. As B&K went no further than describing the effect of a 10dB change in noise level as 'significant', I'm willing to say a 20dB increase would be 'alarming'. Unless the proposed night fleet and its attendant noise is dramatically scaled down from the day fleet I would expect sleep disturbance to be a nightly problem. Perhaps the only realistic way for the Proposal to avoid sleep disturbance would be with no night-time operations. I'm expecting this would certainly be the case during the temperature inversion season. Although we don't hear noise from the Stratford mine we expect earthwork so close to us will be another matter.

Low frequency noise (LFN). The INP states (4.1, Introduction) *"Where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise of the same noise level".* An 88 page report on Low Frequency Noise and its Effects (2003) was prepared for the British Department for Environment, Food and Rural Affairs (Defra) by Dr Geoff Leventhall, Consultant in Noise, Vibration and Acoustics, assisted by Drs Peter Pelmear and Stephen Benton. At Point 2.5 of that report, Introduction to the physics of low frequency sound, Sources, it states: *"Low frequency noise and infrasound are produced by machinery, both rotational and reciprocating, all forms of transport and turbulence. For example, typical sources might be pumps, compressors, diesel engines, aircraft, shipping, combustion, air turbulence, wind and fans".*

B&K's booklet discusses Types of Noise and states *"Low frequency noise has significant acoustic energy in the frequency range 8 to 100Hz. Noise of this kind is typical for large diesel engines in trains, ships, and power plants and, since the noise is hard to muffle and spreads easily in all directions, it can be heard for miles. Low frequency noise is more annoying than would be expected from the A-weighted sound pressure level". "Low frequencies, compared to high frequencies, are poorly attenuated by barriers"* and *"low frequencies are not well attenuated by atmospheric absorption".*

Apart from the above authorities, there is ample anecdotal evidence that diesel engines produce copious quantities of low frequency noise. The noise output from the Proposal will generally be from large diesel engines and the visibility barriers will have little attenuation effect on these low frequency sounds. In fact noise generated immediately to the east of the visibility barriers, as variously discussed in EIS Section 4.2.5.1, pg 4-28, will only be partially blocked to the west but to some extent reflected off the barriers and to the east, potentially increasing the noise levels projected to the east. Even if the increased noise level caused by reflected noise is *"not noticeable by some people but may be noticeable by others"* it represents, according to WM's Assessment Methodology, a 3 – 5dB noise level increase over a noise level with no reflected content. It is quite likely that the increased *"noticeability"* of the noise level would be described as *"noticeable by most people"* which means a noise level increase exceeding 5dB. I see no evidence that the higher noise level caused by reflection off quite steeply angled visibility barriers has been considered.

The WHO also identifies low frequency noise as an environmental problem. Its publication on Community Noise (Berglund et al., 2000) includes *"When prominent low frequency components are present, noise measures based on A-weighting are inappropriate"* and *"Since A-weighting underestimates the sound pressure level of noise with low frequency components, a better assessment of health effects would be to use C-weighting".* B&K also discusses Frequency Weighting Curves, saying *"Our hearing is less sensitive at very low and very high frequencies."* and further *"The most common frequency weighting in current use is "A-weighting" providing results often denoted as dB(A), which conforms approximately to the response of the human ear. A "C-weighting" curve is also used, particularly when evaluating very loud or very low-frequency sounds."*

The EIS 4.2.4.3 covers LFN Criteria and states *"The INP recommends that the extent of LFN is assessed in terms of the difference between C and A weighted noise levels. In the event a difference of <15dB exists, a 5dB correction should be applied."* and further *"Wilkinson Murray (2013) concludes that the appropriate criteria for the Proposal are . . expressed in L_{eq}dB(C)".*

When the noise level descriptor includes 'eq' it is specifying an 'equivalent' noise level. My understanding of an equivalent measurement is that it allows relatively quiet periods to be interspersed with occasional quite loud noise events and the measurement to still remain below the 'equivalent' level. As the mining fleet noise will be very loud (approaching the pain threshold) and typically low frequency it would seem appropriate to use the C-weighting rather than the A-weighting for all mining related noise calculations and specifying a maximum noise level rather than an equivalent.

The INP lists 'Modifying Factors' and corrections that should be applied in the event of low frequency noise, impulsive noise and intermittent noise. *"The correction factors were determined following a review of Australian and overseas practices and the relevant literature".* B&K describes the modifying factors as 'penalties'. It should be noted that the INP states *"The modifying factors are to be applied to the noise from the source measured / predicted at the receiver and before comparison with the criteria."* Further, INP table 4.1 describes the LFN Modifying Factor correction and when to apply thus:- *"Measure/assess C-*

and A-weighted levels over same time period. Correction to be applied if the difference between the two levels is 15dB or more." The correction to be applied is 5dB. This correction factor requires no prior satisfying of the intrusiveness criterion.

WM appears to dispute the INP assessment of LFN annoyance and quotes Broner (2011) and Leventhall (2003) (SCSC Vol 1 Pt 1 5.5.1) regarding the assessment of LFN. WM says *"Current research suggests that this approach of applying a penalty based upon the difference between C-weighted and A-weighted noise levels may be inappropriate."* Then quoting Broner *"if it is necessary to utilise a (C-A) sound pressure level at all, it is recommended that a (C-A) difference of at least 20dB be used to indicate the presence of a* ***potential*** *LFN noise problem"*. Leventhall argues that noise levels below the threshold of hearing and infrasound may be included however B&K, in discussing LFN, says *"Infrasound has a spectrum with significant components below 20Hz. We perceive it not as sound but rather as pressure."* It seems infrasound is a definite part of the LFN problem.

EIS 4.2.7.3 covers Operational Noise Assessment and discusses LFN Assessment. WM suggests that *"for low frequency noise to exceed the low-frequency screening criteria at a receptor where the intrusiveness criteria are satisfied, there would need to be a C-A noise level difference of between 22 and 30dB."* This is a dramatically more difficult criterion to achieve than that of the INP and appears an attempt to nullify LFN as a contributing factor to noise assessment.

WM states (SCSC Vol 1 Pt 1 6.5, pg 1-115) *"An investigation of source spectra indicates that most equipment is expected to have a dBC-dBA difference of 5-10dB, with the maximum being 13dB."* WM continued in its LFN assessment with *"Given that the source noise spectra for the equipment to be operated within the Site are not dominated by low-frequency noise, it is unlikely that the screening criteria would be exceeded and, in all cases, the low frequency content of the noise would not result in significant additional noise impact."* As already mentioned the Site equipment will be powered by large diesel engines which will have substantial low frequency noise content. If there is no *"significant additional noise impact"* (from LFN) then there should be no need to put such an onerous impost on LFN assessment.

As stated previously diesel engines produce low frequency noise which will be a feature of the Proposal, a noise which is hard to muffle and spreads easily in all directions with poor air attenuation and poor visibility barrier attenuation. *"The attenuation of sound in air increases with the square of the frequency of the sound and is very low at low frequencies. Other attenuating factors, such as absorption by the ground and shielding by barriers, are also low at low frequencies"* (Leventhall et al., 2003). WM concludes that *"the INP approach of applying a 5dB penalty . . is inadequate for the assessment of low frequency noise"* and *"More appropriate approaches . . are discussed".* WM then mentions the DEFRA approach but suggests it is *"impractical to implement at an impact assessment stage". "Once the Proposal is operational . . we recommend that the DEFRA approach be adopted".*

The next suggestion for predictive LFN assessments is Broner's 'A Simple Outdoor Criterion', which is *"based on a review of 'many case histories and the literature'"*. (SCSC Vol 1 Pt 1 5.5.3 pg 1-57). Simple it may be – appropriate it is not. Table 5.5, Outdoor Criteria for the Assessment of Low Frequency Noise (SCSC Vol 1 Pt 1 5.5.3 pg 1-58) shows the "desirable" night-time noise level as L_{eq}60(dBC) with L_{eq} 65dB(C) as "maximum", presumably calculated at the façade. Immediately below table 5.5 is the statement *"A 5dB penalty is suggested if the C-weighted sound pressure level (SPL) is fluctuating by +/- 5dBC."* This +/- 5dB fluctuation is not a requirement of the INP for LFN assessment. It should be noted that the Simple Outdoor Criterion's 'desirable' and 'maximum' night-time noise levels are equivalent levels which would allow short passages of noise much higher than 65dB(C). Compare this with the EPA's Sleep Disturbance Criterion of $L_{A1,\ 1minute}$ = 45dB(A), effectively a maximum noise level.

WM's recommendation for assessing LFN once the Proposal is operational is the DEFRA approach. It is quite complex but is based on an equivalent noise level, taken over time, exceeding figures in table 5.4, *"it may indicate a source of low frequency noise that could cause disturbance."*

Table 5.4

Proposed Reference Curve for Assessment of Low-Frequency Noise

Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dBL_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34

Examination of the above table shows a very strange reference curve. This referencing only commences at 10Hz and therefore ignores lower frequencies. It is assumed that this curve is attempting to modify the effect of low frequencies and is loading these frequencies compared to 30dB$L_{eq.}$ This would place a 62dB penalty on 10Hz, 57dB on 12.5Hz, 53dB on 16Hz and so on until 200Hz at which point the low frequency penalty or adjustment ceases.

Alternatively, and starting from 160Hz and progressing down in 1/3 octaves, the reference level increases by 2dB with each 1/3 octave to 63Hz, then increases by 1dB to the next 1/3 octave, then 6dB to the next, then 7, 8, 10, 9, 4 and lastly a 5dB reference level increase in the last 1/3 octave to 10Hz. Surely level changes with each 1/3 octave of 2, 2, 2, 2, 1, 6, 7, 8, 10, 9, 4, 5dB can't represent a scientifically calculated approach. Further, the level changes with each octave change from 160Hz down to 10Hz are 6dB, 9dB, 25dB and 18dB respectively. This suggests a particularly high penalty for frequencies below 50Hz i.e. the lower end of low frequencies and therefore a much more difficult task to justify a LFN correction. This LFN reference curve may actually be just as penalising of low frequencies as the A-weighted curve. Perhaps the DEFRA approach should be named the DEAFeR approach! Once again the proposed DEFRA reference levels are described as equivalent levels.

The crux of the matter:- If a person is subjected to noise that prevents them from falling asleep, wakes them from sleep or impacts their quality of sleep then that noise is potentially impacting their whole quality of life. Surely a more realistic approach in assessing the potential for sleep disturbance is to compare the night-time background noise level in the area where a person sleeps, typically the bedroom, with the noise level being experienced in that same room with the noise source applied.

I don't wish to lecture the EPA on noise management but perhaps the Sleep Disturbance Criterion should read *"the $L_{A1,1minute}$ noise level (which is approximately the maximum noise level) from any activity should not exceed the RBL as measured in the bedroom by more than **5dB** when measured in the bedroom".* The Barrington Gloucester Stroud Preservation Alliance asked for noise monitoring inside the house; I support this approach and welcome the Applicant's consideration of this issue. However no amount of noise measurement will convince a person that they are not, or at least should not be, sleep disturbed. I again

suggest that a noise level change of greater than 5dB (>5dB) would potentially disturb sleep rather than simply being 'noticeable by most people'. My only comment is that inside monitoring should be C-weighted.

Intermittent Noise. The INP assessment/measurement for Intermittent Noise is described in the extract from INP table 4.1 below. Intermittent noise has its own 5dB adjustment and is separate and additional to LFN's 5dB adjustment. It appears the statement *"A 5dB penalty is suggested if the C-weighted sound pressure level (SPL) is fluctuating by +/- 5dB",* which was tacked on to the Simple Outdoor Criterion table, is an attempt to roll both LFN and intermittent noise into the one noise impact with just a single 5dB adjustment.

Table 4.1. Modifying factor corrections

Factor	Assessment/ measurement	When to apply	Correction	Comments
Intermittent noise	**Subjectively assessed**	**Level varies by more than 5 dB**	**5 dB**	**Adjustment to be applied for night-time only**

Impulsive Noise. Impulsive Noise is said to have *"a high peak of short duration or a sequence of such peaks"*. This noise could be common thread throughout the life of the Proposal. A correction factor of up to 5dB applies day and night for impulsive noise.

A further potential problem is the Helmholtz effect. *"A room with an open door or window can act as a Helmholtz resonator. This is the effect which is similar to blowing across the top of an empty bottle. The resonance frequency is lower for greater volumes, with the result that Helmholtz resonances in the range of about 5Hz to 10Hz are possible in rooms with a suitable door, window or ventilation opening"* (Leventhall et al., 2003).

Intermittent noise has a correction factor of 5dB which applies at night-time only. Impulsive noise and LFN each have a correction factor of 5dB both day and night however the maximum correction is 10dB from all sources. I believe a 10dB correction will apply at all times with the likely combination of low frequency, impulsive and intermittent noise.

The pervasive nature of LFN. WM has acknowledged that all predicted noise levels are exactly that – predictions. Noise generated from 'point' sources attenuates by 6dB with each doubling of distance from the noise source. The EIS noise level contours progress in 5dB increments and should therefore represent a 75% increase in distance over the distance from the noise source to the previous contour. Examination of virtually all of the plant operation layout figures and corresponding 'Predicted 10% Exceedence' figures (SCSC Vol 1 Pt 1) shows a remarkable set of noise level contours. For example, figure 6.3, Year 0.5 Day plant layout (SCSC Vol 1 Pt 1 pg 1-70) shows up to 10 machines variously working around the main pit area and producing a combined noise level approaching 130dB. Figure 6.4, Pg 1-71, shows the 40dB noise contour as the highest noise level to the north of the Site and by the shape of this contour drawn in figure 6.4, is between 1.5 and 2km from the centre of the noise source. This is despite the haul route and haul trucks passing within 300 metres of the Mine area boundary. I can't understand how a noise level contour of 40dB can be the highest noise contour within approximately 1.5km from the combined noise output from 10 heavy earthmoving machines or 300 metres from a haul truck. According to B&K, a 40dBA noise level equates to the noise level typical of a library. A noise level, typical of a library, is not what would be heard from the mine site.

Another curious situation is in Figure 6.21, 'Year 7.75 Evening Plan Layout' (SCSC Vol 1 Pt 1 Pg 1-94). This shows scrapers working immediately to the south-west of the site offices and many and varied drills, excavators and dozers working the main pit area. Figure 6.22 shows the corresponding 'predicted' evening noise level contours. Most of the noise generation would be centred on the main pit and the 40dB noise contour to the east is shown as approximately 2.5 kilometres from the pit. The 35dB and 30dB contour lines are perhaps only 200 metres respectively further east. This compaction of noise contours to the east is repeated in nearly all of the 'Predicted 10% exceedence' figures. Again in figure 6.22 the 25dB contour appears to exclude our property but a 25dB contour includes land to the north of Bucketts Way East/Waukivory Rd, a distance of some 7 kilometres from the pit.

Figure 6.17, year 4.25 night layout, shows scrapers working to the east of the eastern visibility barrier yet figure 6.18 appears to show the 40dB, 35dB, 30dB and 25dB contours with very little separation and again, skirting our property while showing 25dB contours covering the

majority of Gloucester Township and even a 30dB contour north of Bucketts Way. It is also interesting to note the Year 4.25 35dB evening and night noise contour skirts around almost all of the Thunderbolts Estate and Avon River Estate properties which seems almost too good to be true. The modelling used to create these noise contours appears to be unsatisfactory, at least for the Gloucester Valley, and is more indicative of 'line of sight' contouring. I would have expected the noise contours to have a pattern much more closely aligned with the dust deposition and PM concentrations patterns. My understanding of the pervasive nature of mid and particularly low frequency noise suggests the noise contours depicted in the EIS are far too selective.

I must also comment that the exclusion of all noise contours over the entire Site is completely unacceptable. It has made it impossible to fully assess the noise mapping. It would have been helpful to have noise contours within the Site at appropriate noise contour levels and ranging up to the cumulative noise level. With no noise contours within the Site it is impossible to understand how noise generated at well over 120dB within the site has attenuated to 40dB, 35dB or even 30dB as the highest noise level contour immediately outside the Site. There are only a few '10% exceedence' maps where 45dB noise contours are exhibited. Despite this, with a 40dB contour line some 2.5km from the noise source, the 35dB noise contour line would fall at approximately 4.4km distance from the source, a noise contour of 30dB at 7.6km distance and so on. However the exceedence diagrams consistently show a 10dB attenuation and, in figure 6.30, a 15dB attenuation to the east from the 40dB contour line with only an approximately 15% increase in distance from the noise source. There is no explanation why the noise contours are compacted and my knowledge of the topography suggests there is no justification for such compaction.

Regarding noise mitigation the measures proposed are barriers, restricted operations under adverse weather conditions, use of sound suppressed equipment, use of predictive weather forecasts, real-time noise monitoring and active site management (EIS Executive Summary ES-12). Comment is required on these:

- The visibility barriers will have little sound or noise suppressing effect on the lower frequency noise expected from the Site.

- The use of Predictive Weather Forecasting doesn't mitigate noise. It should, however, dictate the restricting or cessation of operations under adverse meteorological conditions.
- The use of 'sound suppressed equipment' appears to be nothing more than equipment with standard noise suppression which would be the minimum expected.
- Real-time noise monitoring conducted at the Site would need to be conducted with the wind direction and speed plus other met conditions being taken into account. What matters is the noise impact at the receptors, not the noise level registered at the Site met station.
- 'Active site management' explains nothing other than in EIS table 4.11, pg 4-33, various levels of operating fleet reduction are proposed for periods of adverse met conditions plus fleet reduction during evening and night-time.

The DGR specified an assessment be made of noise mitigation measures including *"not operating at night and not operating during evening and night-time hours"*. EIS 4.2.5 was nominated as the response to this DGR however there appears to be no mention of such non-operation during evening and/or night. A minor concession during the Site establishment and construction phase is in table 4.9, pg 4-30, where *"No significant night operations"* is stated for night-time, what ever that means. This last statement appears to conflict with 2.5.7 and table 2.4 which states 'normal' site establishment and construction hours for the mine area as 7am – 10pm while 'contingency' hours for all on-site activities would be to 10pm, therefore no night operations.

The assumption that Gloucester residents will accept noise exceedences *"on a 10% exceedence basis at most privately-owned receptors surrounding the Site"* (ES-12) is also assuming that some receptors will suffer exceedences above 10% and just have to wear it. I can only assume what a 10% exceedence means but perhaps it means the day, evening and night-time project-specific noise levels (which will be the intrusiveness criteria) may be exceeded 10% of the time. The INP describes project-specific noise levels: *"For a particular project, the more stringent of the intrusive or the amenity criteria sets the projectspecific noise levels for that project. Generally, the intrusive criterion applies for all new industries."* I, and I'm sure any other reasonable person, will not accept the possibility of the criteria being

exceeded variously for perhaps 2 or more hours per day. The receptors other than the 'most' will likely suffer an even greater noise intrusion.

I am at a loss to understand how Wilkinson Murray arrived at the conclusion that our property will be unaffected by noise at any time during the Proposal's establishment or operation. WM was probably unaware of the acoustics of the cutting and valley we live in and the fact we often hear trains rumbling along the line. It is the lower frequencies, the rumble, of the trains that is most noticeable. On one occasion I have heard a train over a period of at least 2 and possibly 3 minutes with the horn sounding 3 times, presumably as it approached the level crossings on Fairbairns Rd, Jacks Rd and Philip St. Although the train would be considered a 'line' noise source, the horn is a 'point' noise source but still audible outside our house and clearly louder than the background noise level.

It must be noted that the INP describes only two zones of annoyance surrounding a noise source, saying *"The various assessed levels of impact around an industrial noise source could be described as a zone of affectation, characterised by annoyance. Within this zone could lie a much smaller zone closer in to the source where impacts were greater and justified acquisition of residences".* (INP 1.4.8) The INP makes no mention of 'noise management zones'. Regardless of this, WM has excluded our house from even its lower 'Noise Management Zone' even though our property is in direct line of sight and approximately 1km from where heavy earthmoving equipment will be placing the overburden and our house is approximately 1200 metres from that same site. This is despite the fact receptors 6 and 23 have been identified as impacted (EIS table 4.14). Receptor 23 is approximately 1.6km from the northern end of the Weismantel pit and is impacted from at least year 2.5 to year 7.75 and probably longer. Our house is only a little distance further, approximately 2km or 25% further from the same pit. Again, our house is approximately 20% further (2.9km) from the centre of the main pit compared to receptor 6 (2.4km). Receptor 6 is included in the 'Noise Management Zone' from year 0.5 through to at least year 13 and in the 'Noise Affectation Zone' from at least year 2.5 to at least year 7.75. Noise, and particularly LFN, will not attenuate over that small percentage distance change compared to receptor 6 to the point where we, at no stage, are above the criteria.

In my opinion the EIS noise assessment lacks credibility. 'Noise Management' zones have been introduced while ignoring the INP's classification of a noise acquisition zone. The noise contours appear to be little more than random concentric drawings with no regard to distance-related noise attenuation. Noise contours only covered lands outside the Site and they would have been most relevant to an overall noise picture. Visibility barriers are continually described as also being noise barriers but they will be virtually ineffectual for low frequency noise attenuation. The assessment has failed to provide important and relevant information while effectively duplicating supposed attributes (use of predictive weather forecasts and restricted operations under adverse weather conditions). I believe the noise assessment is not objective and must be considered as substantially biased in favour of the Proposal.

The INP sums up the issue of noise impact quite well: *"It is important to reiterate there is no single identifiable noise level that all people will find acceptable or unacceptable. Annoyance increases with increasing noise, but at any given noise level there will be a wide variation in the range of individual reactions to noise. In extreme cases health can be affected, but generally it appears that annoyance can occur well before there is a question of health impact."*

GREENHOUSE GAS EMISSIONS

The DG required the Proponent to assess the potential greenhouse gas (GHG) emissions from the Proposal including Scope 1, 2 and 3 emissions. Also required is the potential impact on the environment from those emissions and measures to minimise GHG emissions and ensure energy efficiency. Scope 1 covers emissions directly related to the Proposal which includes fugitive methane (CH_4) emissions calculated as CO_2 equivalent emissions. Fugitive methane emissions form the major part of Scope 1 emissions and, as calculated, contributes twice as much GHG to the environment as does diesel emissions from combustion.

The EIS (4.4.7.4, pg 4-84) uses a CO_2 equivalence factor (CO_2-e) for methane of 21, meaning methane is considered 21 times more polluting than CO_2. However current thinking considers methane to have a CO_2 equivalence of closer to 80 which means the greenhouse gas emissions directly attributable to the Proposal (Scope 1 emissions) may be 3 or 4 times the 1.6 million tonnes CO2-e over the life of the Proposal as stated in EIS table 4.41. EIS table 4.41 also reveals total GHG emissions from the Proposal would exceed 43 million tonnes

CO_2-e GHG over the life of the proposal. Although the Scope 2 and 3 emissions are not attributable directly to the Proposal, these emissions would not exist without the Proposal's existence.

EIS 4.4.8.16 discusses the estimated GHG emissions and states *"The estimated GHG emissions intensity of the Proposal is approximately 0.06t CO_2-eROM coal (Scope 1 emissions only) which is similar to the majority of open cut coal mines in Australia (0.05t CO_2-e coal) (Scope 1 emission only)."* Rather than similar to the majority my calculations suggest 0.06 tonnes from the Proposal is 20% greater than 0.05 tonnes from the majority.

The required response to the DG regarding potential impact of the above emissions addresses only Scope 1 emissions saying *"Average annual Scope 1 emissions . . would represent approximately 0.02% of Australia's commitment under the Kyoto Protocol . . and a very small portion of global greenhouse emissions".* Global greenhouse gas emissions now exceed 400 parts per million (ppm) and rising, well above the 350ppm suggested as the maximum the planet can sustain. The Proposal's GHG may be only *"a very small proportion of global GHG emissions"* but that is not the point. We are living on borrowed time and the record high temperatures of recent years and particularly the winter of 2013 are a stark reminder that we cannot continue burning fossil fuels and adding to GHG as before.

In response to the DGR on minimising GHG emissions there is very little of substance other than planning for minimum haul distances for ROM coal and overburden thus saving fuel. Surely it would be a basic design strategy to keep haul distances as short as reasonably possible. The only other specified saving on energy would be to employ LED lighting within enclosed areas for task lighting. In the overall scheme of energy consumption and efficiency the saving achieved by the use of LED lighting in enclosed areas would be insignificant.

SOCIAL AND ECONOMIC

The DGR asked for an assessment of *"impacts on social amenity, particularly those impacts associated with residents of Gloucester, large lot residential estates on Gloucester's outskirts and nearby landowners and residents".* The Proponent states in A3-8 that its response is detailed in EIS 4.16.7.2. but this sub-section only discusses proposed Key Economic Benefits. However 4.16.7.3 is headed 'Potential Economic Costs' and discusses price inflation in the

residential property market, demand pressure on labour, decline in agricultural production, reduction in tourism and maintenance cost impact for Council. Of these sub-points, the price pressure on the residential property market is the only point that could be seen as relevant to the DGR. At the time of preparing this submission, rather than the Proposal creating property price inflation, it seems that some properties will only sell at fire-sale prices. Key Insights mentions (SCSC Vol 4 Pt 14, 1.3 pg 14-31) The International Principles for Social Impact Assessment which includes:

- *People's way of life*
- *Their community*
- *Their environment*
- *Their health and wellbeing*
- *Their personal and property rights*
- *Their fears and aspirations for their future and the future of their children.*

These are some of the issues influencing social amenity and 'The impact on social amenity', as detailed and requested in the DGR, has clearly not been addressed.

Many of Gloucester Shire's residents and property owners are concerned about their social amenity. Key Insights' Community Perception Survey asked respondents whether they had *"any other comments . . in relation to the proposed Rocky Hill Coal Project".* Of those who answered this question (67% of total respondents), 10.1% were supportive of the mine while 80.7% opposed the mine. This response mirrors that of the Gloucester Council population survey which recorded a similar 'NO' response to the Proposal. With the knowledge of two separate population surveys, one of which was by the Proponent's own consultant, showing an overwhelming rejection of the Proposal, it would seem reasonable to expect the Proponent would be eager to address this vexed issue but instead, has chosen to ignore it. It is clear the Proponent has no social licence to proceed with the Proposal.

CONSULTATION

The DGR asked that, during the preparation of the EIS, the Proponent consult with, amongst others, affected landowners. As we are immediate neighbours of a GRL owned property and close to the mine site we wrote to the Proponent on 30 April 2012, outlining our concern at the closeness of the proposed mine and asking them to *"give strong consideration to acquiring*

our property". Mr. Polwarth replied on 12 June 2012 saying GRL was in *"the early stages of the process and are therefore not yet in a position to quantify or ascertain the specific impacts on any property, determine whether or not they are affected, nor determine the necessity or otherwise for any ameliorative or other measures such as acquisition".* In short*, no we won't buy your property, at least not yet*. Mr. Polwarth also said GRL had repeatedly expressed a willingness to discuss peoples' concerns on a one-to-one basis. However our understanding of the response to our written request for acquisition was that there was nothing further to discuss.

The Proponent has made no attempt to contact us following their letter to us of 12 June 2012. The process of consultation was not easy as, prior to 28 August 2013, GRL had no local office and no phone listing in either the local district phone book or with Telstra. On 11 September 2013 I attended the Proponent's Project Information Centre in Gloucester and again asked Mr. Polwarth whether GRL is in a position to acquire our property to which he answered *"not at this stage"* or words to that effect.

HUMAN HEALTH

Although not a specific DGR Key Issue, population health is inextricably linked to air quality, water quality, noise impacts and social impacts from the Proposal. Personal events in our life (events beyond our control) have caused much anxiety to us and real concerns for our future have only heightened these feelings. More recently my wife has been diagnosed with emphysema although she has never smoked in her life. We chose to retire to this property for its potential to allow us as healthy and unpolluted a lifestyle as possible.

It is noted that, of the 2500 or so pages prepared for the EIS and the accompanying Specialist Consultant Studies Compendium (SCSC), the Health Risk Assessment (HRA) is wrapped up in the EIS in just 4½ pages. Although there is no requirement in the DGR of the need for GRL to provide a HRA, there is the requirement to address Air Quality issues including $PM_{2.5}$, PM_{10} and dust as well as emissions from diesel, spontaneous combustion and blast fumes.

GRL subsequently *"commissioned Toxikos Pty Ltd to undertake an independent human health risk assessment (HRA) of the emissions to air from the proposal".* The HRA Conclusion, 4.4.9.5, Section 4 page 112 trumpets *"The conservative assessment of the*

potential acute and chronic health risks of increased levels of $PM_{2.5}$ and NO_2 associated with the Proposal has established that the potential health risks are negligible or acceptable at the receptor with the highest impacts expected."

In my opinion this conclusion is flawed as it is a downplaying of the executive summary by Toxikos (SCSC 2B-7) which said *"Overall, it is concluded that air emissions from the proposed Rocky Hill Coal Project present little likelihood of causing adverse health effects to exposed individuals around the site".* Toxikos also said *"In examining the risk in the population due to the increased long-term exposure to PM2.5 as a result of the Proposal, an increase in base incidence annual mortality from 658 to 660 per 100,000 was estimated, a resultant increase of 0.002%."* It must be emphasised that this is only an estimate and Toxikos does not appear to have used the terms 'negligible' or 'acceptable'.

In its brief, Toxikos asks (SCSC1.2, 2B-9**)** *What is a Health Risk Assessment?"* and continues *"Health is defined by the World Health Organisation (WHO) as a state of complete physical, mental and social wellbeing and not merely the absence of disease infirmity (WHO 1948)".* Toxikos then focussed on 'wellbeing' and the *"many social and economic factors that impinge on wellbeing".* Toxikos, in focussing on social (and economic) factors, has avoided discussion of physical and mental issues, issues that should have been obvious as factors impinging on wellbeing with the Proposal on Gloucester's outskirts. I'm confident any reasonable person would agree with the WHO and assume physical, mental and social wellbeing would all be given appropriate weight in a comprehensive health risk assessment.

Emissions to air form only a part of the total impacts potentially affecting our health and the health of the people of Gloucester. Although mentioned elsewhere, this HRA ignores Carbon Dioxide (CO_2) emissions, noise pollution, light pollution, anxiety caused by dramatically increased road traffic, solastalgia and other psychological matters, falling property values (81% of respondents to the GRL commissioned Key Insights' population survey of the Gloucester district agreed or strongly agreed property values near the new mine would be negatively affected).

The HRA, the EIS and the SCSC fail to even mention anxiety from the inability to sell a property within a reasonable timeframe. Even at this stage of public exhibition of the EIS

some Gloucester residents, who have had their property listed for sale for some time, are already suffering the inability to sell. Although population anxiety is ignored it is particularly noted that in the Evaluation and Justification of the Proposal (EIS 6.4.5.i), Consequences of not Proceeding with the Proposal, *"anxiety issues related to lost employment opportunities"* is prominent. GRL is therefore conceding anxiety will be a consequence to potential employees should the Proposal not proceed and must also concede anxiety already exists among many and will be a consequence for many more should the Proposal proceed. While ever there is uncertainty about the mine proceeding there will be no satisfaction or closure for those who feel anxious or threatened or depressed. Certainty will only come when either:-

- the Proposal is refused or
- the Proposal is approved and the infrastructure works are complete and mining works commence.

An approved application which is put on ice will only prolong the uncertainty and exacerbate the suffering.

To return to the HRA conclusion, it is surely a bridge too far to concede the likelihood of a small increase in mortality from long term $PM_{2.5}$ exposure and to then conclude *. .the potential . . health risks of increased levels of $PM_{2.5}$ and NO_2 . . are negligible or acceptable . .* I don't know who would find these potential health risks acceptable. What is not acceptable is to focus only on increased mortality as if that is the only consequence to human health should this Proposal come to fruition. The HRA conclusion is ignoring the WHO's health definition of *complete physical, mental and social wellbeing* and even ignoring GRL's own concern for anxiety issues. The risk must be considered taking all adverse factors into account.

NEED FOR THE DEVELOPMENT

The response to the DGR (EIS 1.5, pg 1-17) regarding the need for the development gives only an explanation for the desire for the development rather than the need. The main product being sought from the Site, semi-hard coking coal, makes up only about 30 – 35% of the total coal deposit and is described in the EIS as being superior to many coking coals produced in Australia. This is conceding there are coking coal reserves equal or superior to the Proposal's product, such as Premium Hard coal. The information provided does not demonstrate a need for this product.

Likewise the secondary product, thermal coal, is described as superior *to "many other thermal products in the market place"*, again conceding thermal coal equal to or superior to the Proposal's product is already available. Thermal coals are already in abundance and being extracted from existing mines along the east coast of Australia and elsewhere in the world.

With both coking coal and thermal coal, of equal or superior quality already available in the market, there is no demonstrated need for either product to be mined from the Site. I therefore believe the DGR has not been satisfied.

JUSTIFICATION FOR THE PROPOSED MINE PLAN

This DGR includes the efficiency of coal resource recovery, mine safety and environmental protection. It is disappointing the DGR didn't require the proponent to demonstrate the viability of the Proposal through to completion and final rehabilitation. The non-existence of an assurance of viability by the Proponent is obvious. This failure to demonstrate viability is particularly relevant as the EIS acknowledges (2.3.2.2, pg 2-13) *"The coal resource within the Mine Area is heavily banded and interbedded with non carbonaceous material"*. It has been known for years that the Gloucester Valley coal seams in the vicinity of Waukivory Road and Waukivory Creek present significant extraction difficulties which must make recovery of the coal resource a comparatively inefficient procedure.

Consequences of not Proceeding with the Proposal

The Director General has not asked for discussion of this matter and the 'consequences' raised are fairly obvious but still need to be challenged.

i) This point discusses the lost employment opportunities for numerous Gloucester and district residents should the Proposal not proceed. A mine requires specialised trades and people qualified to perform the work typical to mining. There will be very few Gloucester District residents suitably qualified and available for work if and when the mine work commences. The claim of a reduction in spending to Gloucester is false. It would be more accurate to suggest that an increase in spending may not eventuate however, as revealed in the Key Insights interview with the Gloucester Chamber of Commerce, the Stratford mine made little difference in local spend and a successful approval to

this Proposal would probably afford the same result. Also, the anxiety issue over lost employment opportunities is a hollow argument. The closure or failure of a business will most likely cause anxiety issues over lost employment but to argue the loss of employment opportunities with the non-procedure of an enterprise that has no surety of approval is unrealistic. The suggestion of *"an opportunity for inward migration of mine and support workers and their families "* is, to a real extent, contradicting the statement about employment opportunities for Gloucester and district residents.

ii) The suggestion of direct expenditure in the local economy is altruistic but is unlikely to eventuate. Pure economics will dictate the need to seek 'the best price' for goods and services and it is anticipated the majority of these will be sourced from outside the Gloucester Shire.

iii) The additional rates revenue to Council must be offset by the additional cost to Council should the Proposal come to fruition. As mentioned below, Council will carry the burden of an accelerated deterioration of both the east and south sections of Bucketts Way and the 4km northern section of Waukivory Road.

iv) The additional beneficial environmental and related outcomes mentioned are overstated. The proposed Biodiversity Offset Area is of modest size and at present is largely undeveloped (and unsuitable for development) dry sclerophyll forest or open woodland. The replacement of the Jacks Road bridge over the Avon River would be constructed to accommodate heavy vehicles travelling to and from the Site. The upgrade of Jacks Road would likewise be completed to handle heavy vehicles. The Proponent intends upgrading only the section of Waukivory Road from the intersection with Jacks Road to the intersection with McKinley's Lane but not the 4km northern section of Waukivory Road from the intersection with Bucketts Way east to the intersection with Jacks Road (EIS 2.5.6, pg 2-39). EIS 4.9.2.3 pg 4-221 describes the pavement condition of the 5.2km of Waukivory Rd from the intersection with Bucketts Way east to McKinley's Lane. The plate 4.2 photo (4-223) shows pavement failure on the northern section of Waukivory Road, a road surface which is notorious for failure even in dry conditions. It appears the Proponent does not intend an upgrade of this section of road. It is anticipated that 30% of all light vehicle movements to and from the Site would travel via Waukivory Road which includes the 4km

northern section. Heavy vehicle movements from the north and east would also travel via Waukivory Road while heavy vehicles from the south would again travel via Waukivory Road until the Jacks Road bridge replacement is completed. The Proponent intends paying *"a road maintenance contribution to Gloucester Council reflecting the Proposal-related traffic volumes generated on Jacks Road and Waukivory Road"* (EIS 6.3.2.2, pg 6-17), however it is not stated whether this contribution is for maintenance of only the 1.3km section of Waukivory Rd from Jacks Rd to McKinley's Lane or the full 5.2km from Bucketts Way East to McKinley's Lane. There appears to be no contribution towards the maintenance of Bucketts Way which will carry the traffic entering and leaving the site. All of these proposed upgrades would be carried out for the benefit of the Proposal and the benefit to the community would be welcome but incidental to the Proposal.

v) "*The various impacts predicted to occur as a result of the Proposal would not eventuate . . ".* This is a most desirable consequence for the local environment, the tourist industry, the nearby residents, children and vulnerable members of the Gloucester community, the tens of thousands of people who rely on the Manning River for their water supply.

Of the remaining likely outcomes, many of these can be overcome with renewed certainty for the future of Gloucester as an agricultural district and as a tourist and lifestyle destination. Once certainty is assured I am confident that innovative businesses and industry, such as The Gloucester Project, will secure Gloucester's future.

Proposal Objectives

The EIS Executive Summary lists 5 Proposal Objectives (ES-2) which are paraphrased below. Many of these objectives appear doubtful or unachievable.

- To maximise coal recovery
- To undertake all activities while meeting reasonable community expectations and documented commitments
- To create a final landform, sympathetic to the existing landform and amenable to grazing and nature conservation

- To provide an economic stimulus to Gloucester and the local community through employment and supply opportunities
- To achieve the above objectives while ensuring the Project is viable.

To comment on these above objectives :-

1. *To maximise coal recovery*. Maximising coal recovery is GRL's raison d'ètre however coal recovery would only continue while the enterprise is profitable.
2. *To undertake all activities while meeting reasonable community expectations and documented commitments* needs to be challenged. A Reasonable Gloucester Woman would expect her children to be able to breathe clean air, a basic human requirement. A Reasonable Gloucester Man would expect to be able to partake of 'quiet enjoyment'. With winds dominating from the southern quarter and winter temperature inversions, both of these reasonable expectations will be largely unachievable if the mine proceeds. A Reasonable Person accepts they live in a town with a mine (Stratford) but rejects their town becoming a mining town.
3. *To create a final landform, sympathetic to that existing and amenable to grazing and nature conservation* needs further investigation and explanation. Although the documented commitments to rehabilitate the land are commendable, financial viability will dictate whether the mine site is returned to a landform amenable to revegetation or is left as an overburden dump. Even if the rehabilitation is completed, loose filled overburden with a skim of subsoil/topsoil will have poor structure, heavily depleted biota and very little water holding capacity. It will be challenging even for weeds to succeed and is unlikely to eventuate.
4. *To provide an economic stimulus to Gloucester and the local community* is questionable. The economic stimulus to Gloucester and community will, most likely, be minimal, a Clayton's stimulus. Key Insights' discussion with the Gloucester Chamber of Commerce (SCSC Vol 4 Pt 14 App 2 pg 14-271) revealed that *"When Stratford (mine) opened it didn't make much difference to the town in terms of real estate prices, employment or dollar spend"* and *"Gloucester Coal doesn't actually buy much in Gloucester. They should shop local. They buy in bulk from elsewhere"*. It would be hard to see the Proposal being very much different to the Stratford experience.

5. The last-mentioned objective, *to achieve the above objectives while ensuring the Project is viable*, is the crux of the entire Proposal. In early 2012, GRL made the decision to proceed with the Proposal. Although comparative coal prices in early 2012 and current prices have not been mentioned, it is common knowledge that prices have fallen considerably in that time. If this Proposal does receive approval to mine, there are various scenarios which could happen. First, all activities may be put on hold as the Proponent may realise the mine would not be viable if commenced at that time. This distinct possibility would be a disaster for Gloucester as there would be an increased lack of confidence in the future of the town. Second, the infrastructure and mine may commence with the aim of extracting the higher value coal (*"the nominated sequence providing access to some of the highest quality coals in the early years of production."*) (EIS2.3.2.4 pg 2-13) while hoping for a price resurgence in the steaming coal market. If this scenario was to happen and coal prices did not recover, as many people believe, then the mine could be abandoned. This would again be a disaster for Gloucester. As the decision to proceed with the Proposal was made some 18 months ago the viability of the Proposal, based on current coal prices, should be demonstrated before an approval is considered. I believe objective 2, meeting reasonable community expectations, is unachievable for this Proposal and is independent of whether the Proposal is viable or not.

Observations

1. The Proponent was obliged to respond to the Director General's Requirements. It appears that in many instances the responses are inadequate or non-existent.
2. Gloucester is, or was, a growing rural community before the Proposal.
3. The proximity of this proposed mine to residential areas and Gloucester Township has seen a virtual stalling of development in the last 18 months. There has been no new residential development in the Forbesdale Estate for some 5 years.
4. The Proposal is within 2 kilometres of the Forbesdale Estate, Thunderbolt's Estate, the Avon River Estate and our own property.
5. Gloucester presently has a thriving and potentially ongoing tourism industry as, for the moment at least, there is minimal visual destruction of the Vale.
6. Gloucester's agricultural outlook is bright with an increasing diversity of production.

7. The Gloucester Project Inc. has drawn state-wide and national attention for its innovation and potential for ongoing employment opportunities. This can be developed, providing local employment, as well as a model for other communities.
8. I believe this Proposal must be assessed as presented in this EIS with no consideration given to any possible future modification. This includes assessing the viability of the Proposal as presented which dictates the final outcome to the Gloucester district.
9. There is no cost-benefit analysis supporting the Proposal.

This proposal has affected or will affect us in the following ways:

- Our visual amenity, a feature of our property, will be lost should the Proposal come to fruition.
- Our property value has already been adversely affected and may be difficult to sell on the open market.
- We will suffer unacceptable noise impact both inside and outside our house.
- We believe we will be impacted by an unacceptable level of airborne emissions around our house when wind blows towards us from the mine site as it often does. These airborne particles are likely to adversely affect our health.
- Our emotional health has been compromised. GRL acknowledges that prospective employees may feel anxiety should the Proposal not proceed. However many Gloucester residents, including ourselves, are presently experiencing, and will continue to experience, the same anxiety with the Proposal on their doorstep.
- We have a feeling of frustration at being forced, against our will, to leave our chosen retirement home.
- We are extremely annoyed at the time and emotional effort that was required to wade through the EIS and SCSC to refute many of the claims contained therein. The CD containing the EIS and SCSC was formatted to deny copying of content which made a lot of extra work. Various figures were set up with too much detail on the one page making assessment difficult. As an example I point out the wind rose diagrams where just one page contained 10 wind roses.

Net Benefit or Detriment?

The DGR required an assessment of the potential direct and indirect benefits of the Proposal plus the potential impacts on the local and regional communities. The potential benefit, as detailed in 4.16.7.2, could have been mistaken as an almost financial bonanza to local, NSW and Australian economies with many millions of dollars in total spend through direct and indirect benefit.

Assuming 4.16.7.3 is attempting to respond to 'The potential impacts on the local and regional communities', this sub-section only discusses economic costs. There is no mention of impact from air, noise or light pollution, polluted waterways, social upheaval, loss of visual amenity, the impact on flora, fauna and aquatic biodiversity. The only reference to these impacts is at 4.16.8 with the comment *"A range of negative social and economic impacts could also be associated with the proposal."* Yet again the DGR have not been answered.

Summary

The claimed benefit from the Proposal comes down to only an economic benefit. Any economic benefit relies on the Proposal being sufficiently viable to proceed through to completion including full remediation of the Site. Viability has not even been hinted at, and certainly not demonstrated. With the decline in coal prices and acknowledged difficulty to extract the coal, there is good reason to suspect the Proposal, should it be approved and commenced, will not proceed to full completion and remediation.

Offsetting the claimed benefits are the existing negative impacts such as depressed property values, emotional impacts from the potential for social disruption and relocation of nearby residents from now company owned properties because that was their only realistic option. Should the Proposal be approved there will be added emotional stress as it is expected that there would be a delay of unknown and perhaps indefinite duration before construction works commence, effectively leaving the community in 'no-man's land'. Again, and assuming the Proposal is approved and construction works commence, there will be the many personal, social and environmental impacts as mentioned in the EIS. An attempt has been made in the EIS to mitigate, negate or ignore all of these impacts while talking up the suggested benefits, however a goodly proportion of the EIS hype cannot be substantiated

Although the EIS (4.16.8, pg 4-354) quotes Key Insights' conclusion that *"On balance, Key Insights (2013) has determined that there would be a net social and economic benefit associated with the Proposal"*, I must disagree with this conclusion in the strongest of terms.

I believe there are sufficient grounds to refuse the Application.

If, despite my objections, my wife's objections and those of many others, the Proposal is approved then I ask that acquisition rights should apply to our property.