STRATFORD EXTENSION PROJECT: SSD-4966

ENVIRONMENTAL IMPACT STATEMENT

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SUBMISSION BY THE BARRINGTON-GLOUCESTER-STROUD PRESERVATION ALLIANCE

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Barrington-Gloucester-Stroud
Preservation Alliance Inc.

(Incorporated under the Associations Incorporation Act, 1984)
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1 Overview

Introduction

The Barrington-Gloucester-Stroud Preservation Alliance (BGSPA) is an incorporated association of residents of the Gloucester Stroud Valley. It was established in 2006 in response to the announcement by several resource companies of planned developments that would result in the major expansion of coal mining and coal seam gas extraction in the valley. The objective of BGSPA is to preserve the essential rural character of the valley and to oppose developments that would damage that character.

BGSPA members participated in the Working Group established by Gloucester Shire Council to review the information contained in the EIS and assist with the preparation of its submission. Council has developed a comprehensive submission to address its concerns and those of the local community. BGSPA welcomes and strongly supports Council's submission and most of its recommendations and proposed conditions of consent.

In preparing its submission, BGSPA has attempted to avoid simply reiterating points that have been addressed in detail by Council. Instead, we have attempted to focus on those matters that are of primary concern to our members, and on matters where we have a divergence of opinion with Council. Nevertheless, there is considerable overlap in the respective submissions.

BGSPA is primarily concerned with the impacts the proposed expansion of mining at Stratford will have on local residents and the valley's essential rural character.

BGSPA's Position

The EIS is a very lengthy document that attempts to address a range of complex issues and provide broad justification for the project. Not surprisingly, the EIS talks up the economic benefits of the project, down-plays the negative health and welfare impacts that will largely be borne by the residents of Stratford and Craven and dismisses or trivialises most of the environmental impacts that will affect the whole valley and its community.

Our assessment of the EIS is that it is deeply flawed and hence inadequate for the purposes of enabling the Department to fully assess the merits of the application. We find many of the impacts to be understated and much of the proposed mitigation to be either inadequate or overly ambitious. There are serious errors of omission.

The socio-economic assessment for the project should clearly demonstrate to decision makers that the cost the local community must bear, in loss of amenity, damage to health and reduced financial values of properties, is justified by the benefit to the wider community, and why no other alternative is feasible. It has done neither.

We have attempted to deal with these matters in a constructive manner. We have provided detailed comments about specific issues and proposed alternative mitigations or recommended conditions of consent where appropriate. We have suggested that the proponent be required to re-present certain critical information.

Expanded comment on these matters is provided in the body of this submission. We trust that in its assessment of the application, the Department will give due weight to our comments and suggestions.

There are many in the community who say that "enough is enough" and that the Stratford coal mine should be wound up when its current development consent expires. They point to the relatively small amounts of coal being extracted; its marginal economic viability; the

impacts of noise and dust on neighbouring residents; the health impacts arising from mining so close to Stratford village and the negative impacts on alternative land uses.

BGSPA objects to the expansion of the Stratford coal mine as proposed in the EIS. We cannot conceive that an approval could be granted based on the information presented. If the Department cannot be persuaded to this view, we expect that the approval would incorporate the recommendations and proposed conditions of consent contained in this submission.

EIS Fundamentally Flawed

The fundamental flaw in the EIS is that it is based on a false premise - that mining will cease at the site in eleven years upon the completion of this project. This premise is not supported by either history or evidence. This false premise impacts virtually every aspect of the environmental assessment.

The Stratford and Craven communities were asked to accept a "boutique" coal mine in 1995. This mine was to have a limited impact and a short life after which it would be closed and the site rehabilitated. The land was to be returned for farming and it was proposed that the void be used for aquatic recreation.

This did not happen.

Instead, the Duralie coal mine was approved and developed, with its ROM coal railed to Stratford for processing. A subsequent expansion of the Duralie mine was also approved. The Bowens Road North and Roseville West open cuts were each approved and developed. Mining and attendant coal handling and processing has extended way beyond the timeframe that the community was originally asked to support.

It is no secret that the proponent has undertaken extensive exploration in recent years and has apparently identified significant coal reserves. This has been regularly reported to the ASX and details can be found on SCPL's website. Rumours abound about huge reserves in the vicinity of Wards River township and the company itself has publicly stated its intention to continue mining until 2030 and beyond.

In addition, the proponent has purchased many properties in the heart of the valley, from Duralie to Forbesdale. This is obviously not with the intent of diversifying into agriculture.

Yet there is not one mention in the EIS of any of this, beyond an oblique and cursory reference to ongoing exploration.

Local residents are being asked to support the continued and expanded operation of the Stratford mining complex without being provided the full facts. Some may reluctantly accept this project as being tolerable for a further 11 years in the expectation that, after cessation, they will be able to "get on with their lives" in a peaceful, rural environment. That acceptance would likely evaporate were they to be made aware of the proponent's intent to continue for an additional 17 years (or more) following this project's conclusion.

Residents have previously faced this situation. Many made the decision to stay rather than sell up and go, based on the original limited approval. Others made that decision at the time of the BRNOC approval. Had they been informed at the outset that mining could be expected to continue indefinitely, many would have walked away and made a fresh start elsewhere. Instead, they have effectively "lost" a decade or more of their lives and are now trapped and forced to endure an intrusive and unwelcome neighbour because there is no market for their property. No one else wishes to live with such a neighbour.

The stress and uncertainty caused by this piecemeal expansion of the Stratford and Duralie mines was raised last year at a meeting with the Department's Director of Mining Projects, Mr David Kitto. He acknowledged the concerns and agreed that the practice should cease and that in future, Yancoal would be required to present comprehensive development applications.

We accept the argument that only the specific project can be the subject of this development application. However, it must be realistically set within a context that explains the proponent's future plans and the cumulative impacts of adjacent mining activity. We strongly hold the view that residents should not have to live with continuing uncertainty and that the EIS should go into some detail about issues such as the identified coal reserves and likely future mining projects.

It is also important to note that this false premise impacts on many aspects of the environmental assessment. We identify three examples.

Mine Plan & Rehabilitation

The mine plan proposes that three voids will be left at the conclusion of the project. We suggest that even the proponent is likely to concede that this would be socially irresponsible and tantamount to environmental vandalism. We contend that this proposal has been made in the full knowledge that it is intended to fill these voids with the overburden from pits mined following subsequent approvals. This is the pattern that was followed in relation to the original Stratford (main) pit.

Flora & Fauna Offsets

The development of new pits to the south of the Stratford CHPP will likely require haul roads to be constructed through the proposed Offset Area #3. This would fundamentally destroy the integrity of the entire offset strategy presented in the EIS, which emphasises the re-establishment of the Craven Valley Wildlife Corridor.

Noise & Blasting

The Noise & Blasting Assessment specifically uses the currently scheduled cessation of mining at Duralie in six years time, to support the forecast noise impacts of rail unloading on nearby residents. "Further, it is relevant to note that the unloading scenario is only relevant for the first six years of the Project (i.e. delivery of DCM ROM coal would cease after Project Year 6." (EIS Appendix C p 28.)

Recommendation:

That the EIS be re-presented with detail about identified coal reserves, possible future mining projects and likely duration of mining at the Stratford mining complex. Further, that all relevant sections of the EIS be re-presented with alternative (viz. extended mining) scenarios addressed.

Unexplained Discrepancy in Operational Arrangements

Table 1-1 (p 1-4) of the EIS provides a summary of the project and comparison with the existing operational arrangements at the Stratford mining complex.

The project is forecast to produce 2.6Mtpa of ROM coal with an operational workforce of 250 people and mining operations occurring 24 hours per day at the Avon North and Stratford East open cuts and between the hours of 07:00 am and 06:00 pm at the Roseville West pit extension and 07:00 am and 07:00 pm at BRNOC.

Current approved operations produce 3.1Mtpa of ROM coal (2.1Mtpa [SCM] plus 1.0Mtpa [BRNOC]) with an operational workforce of 125 people and restricted mining operations occurring between the hours of 07:00 am and 10:00 pm at the Roseville West pit and 07:00 am and 07:00 pm at BRNOC.

This staggering discrepancy in operational arrangements is not addressed at all in the EIS. The new project seemingly will be only half as efficient in recovering coal as the existing project. This issue is addressed in more detail later in the submission in relation to the Socio-Economic justification for the project.

The proponent should be required to explain this discrepancy.

24-Hour Mining Operations

The proposed return to 24-hour mining operations is strongly opposed within the community on the basis of predicted effects, current experience of noise from existing mining operations, and past experience of 24-hour mining that was discontinued following completion of mining in the Stratford main pit.

The EIS at Page ES-8 states "Mining operations are currently approved to be conducted between the hours of 7:00 am to 10:00 pm, however, have historically …. been conducted up to 24 hours per day." This creates the false impression that the project is merely seeking to revert to 'normal' hours of operation. Consent was given for 24-hour mining operations for the original 'boutique' mine - the first industrial development in this rural environment - when this community had no prior experience of the actual noise impacts. Neighbouring residents found the stress, anxiety and sleep deprivation arising from the night time noise disturbance to be intolerable. This was acknowledged by the Department of Planning and subsequent consent conditions did not allow night time mining operations. The Stratford coal mine has in fact, now operated under restricted hours for longer than it did under 24-hour operations.

Community opposition to 24-hour mining operations has been voiced throughout the public consultation process. The Community Consultative Committee and Gloucester Shire Council formally recorded their objections in 2011. A large public meeting held in Gloucester in April 2012 voiced overwhelming opposition and most recently, a public meeting held at Stratford on 22 November 2012 unanimously resolved to oppose a return to 24-hour mining operations.

Rarely has a company so clearly put its operational plans in the public domain and had them so comprehensively rejected. Yet the proponent is attempting to push ahead with its plans in the face of this almost unanimous opposition, whilst simultaneously claiming to be a good corporate citizen. It is noted that Section 3 'Consultation and Community Initiatives' of the EIS does not make mention of this widespread opposition.

The Director General's Requirements stipulate that the EIS must include a detailed description of the development, including need for the development and justification for the proposed mine plan.

The bald assertion that measures such as restricting mining to daytime hours would not be economically feasible is not supported in the EIS by any information or analysis that would enable it's veracity to be assessed.

The lack of justification for the 24-hour mining proposed in the mine plan clearly does not satisfy the Director General's Requirements.

Recommendation/Proposed Condition of Consent:

The proposed 24-hour mining operations should not be approved. Mining operations, including waste rock removal, at the Avon North open cut and the Stratford East open cut should be limited to the same operating hours proposed for the Roseville West pit extension, i.e. 0700 hours – 1800 hours seven days per week for the duration of the project.

Collateral Damage

A casual reading of the EIS would suggest to the "general" reader that the only negative impact of the project on neighbouring residents will result from noise, and then only on those who fall within the Project-specific Noise Level (PSNL) contour line presented in the EIS. And these impacts will be able to be "managed" by the proponent.

The reality is quite different, for a coal mine has a very large footprint in terms of effects beyond the project area and every landowner falling within this footprint will be impacted. The most insidious impact is the fact that the landholders' capital investment in their properties becomes frozen. Proximity to a coal mine does not attract buyers and the unsaleable properties effectively become worthless.

Landowners within the mine's footprint become trapped, unable to sell, unable to get out, unable to realise their life plans, unable to respond as necessary to changed circumstances.

What of those landholders who need to sell because they become too old or infirm to manage a rural property? What of those landholders whose life plan anticipated selling this property within the next decade?

Yet this issue is never discussed, never acknowledged. These landowners simply become "collateral damage".

This is a very real and significant social cost that should be factored into the economic modelling for the project's justification, but of course, the proponent has not done this.

A survey of local real estate agents will confirm that properties within the vicinity of the Stratford mining complex have not been able to be sold for many years. The only properties that have changed hands are those that have been purchased by the proponent.

One example will suffice to illustrate this point. A couple in late middle-age and of modest means purchased land at Glen Road Craven, built a house and moved here in the late 1990's. They started a business to sustain them until they reached retirement age. The business wasn't successful and they were forced to move out of the area to find an alternative source of income about five years ago. They listed their property for sale. It remains unsold. It has very occasionally been let during this period. This couple's financial position is grim. The stress has been enormous. Their lives are in turmoil at a time when they should be looking forward to winding down to enjoy the fruits of their working lives.

And during this period, Yancoal's directors, executives and shareholders have continued to be well rewarded. The state has continued to receive royalty payments. Collateral damage.

Recommendation/Proposed Condition of Consent:

If the owners of the properties identified in the Relevant Land Ownership Plan in the EIS (Figures 1-3a, 1-3b and 1-3c) seek to sell their property for any reason during the course of this project and the property is unable to be sold because of the proximity of the Stratford mining complex, SCPL must acquire the property in accordance with the procedures in condition 11.1 of the BRNOC development consent (DA-39-02).

Proximity to Stratford Village

The negative impacts of current operations at the Stratford mining complex on the residents of Stratford Village are well documented through the complaints record and the deliberations of the Community Consultative Committee (CCC) over many years. These impacts primarily go to issues such as noise, blasting and air and water quality.

The health impacts arising from coal mining are now being more widely investigated, recognized and reported in the Hunter and other coal mining regions but not in Gloucester.

The Roseville West pit extension will see the continuation of mining to the west and south of the existing pit. At its nearest location this pit will be approximately 1000 metres from Stratford village.

The Department will be well aware of the deep-seated anger in communities throughout NSW about the relentless onslaught of the extractive industries. One of the things driving this anger is the intrusion of mining into people's daily lives because of the failure of regulatory authorities to insist on reasonable and sensible buffer zones between mining complexes and towns and villages.

It is interesting to note that the Department of Planning is now advocating a minimum buffer zone for wind farms of at least 2 kilometres. That it is not proposing a similar (or even greater) buffer zone for open cut coal mines is indefensible.

Gloucester Council's submission deals at some length with this issue and BGSPA supports the views put by Council.

Cumulative Impacts

The piecemeal nature of the expansion of Yancoal's operations since 1995 has avoided any scrutiny of the cumulative human and environmental impacts of its total mining operations that have now been extant for nearly 20 years. As a principle, an existing development approval should be audited and evaluated before a new approval is given to ensure that cumulative impacts over time and space are assessed prior to any project extension.

The cumulative impacts of mining in the valley are about to be compounded by the concurrent development of the Stratford Extension Project, GRL's so-called Rocky Hill coal project and AGL's coal seam gas project. The human impacts have been commented upon elsewhere in this submission.

One of the community's biggest concerns is the impact on ground and surface water. Each of these projects falls within the Manning River catchment. Yancoal's Duralie mine falls within the Karuah River catchment. The impacts of mining in the Gloucester Stroud Valley therefore have a potentially wide distribution and the downstream communities of the Manning Valley and Port Stephens have a shared concern with local residents about these potential impacts.

Council's submission deals with this issue in detail. BGSPA endorses the views of Council.

In particular, we would reiterate the call for a combined approach to the assessment and analysis of the ground and surface water situation and particularly, the impacts of the large groundwater extractions created by these mining proposals.

The incremental expansion of mining operations has also caused a progressive whittling away and increasing fragmentation of native vegetation. The resultant cumulative impacts on native fauna and flora are significant and have not been adequately recognised.

The effectiveness of attempting to mitigate these impacts by designating other areas as environmental offsets is highly questionable. Existing areas of native vegetation are likely to be "fully occupied" and unable to support the displaced populations. It will be many decades before new plantings on previously cleared areas are able to provide habitat for fauna that requires mature trees for feeding and nesting.

Recommendations:

That an independent audit of the proponent's mining operations in the Gloucester Stroud Valley be undertaken and evaluated to assess the cumulative environmental and social impacts of these operations prior to any decision whether or not to approve this application.

That an integrated study be undertaken by an independent steering committee to assess the cumulative ground and surface water impacts of the Stratford Extension Project, the Rocky Hill Project and the Gloucester Gas Project. The study should be funded by all three proponents and include the total area of the Gloucester Stroud Valley that will be impacted by these projects. No project approvals to be given until this study is completed and impacts assessed.

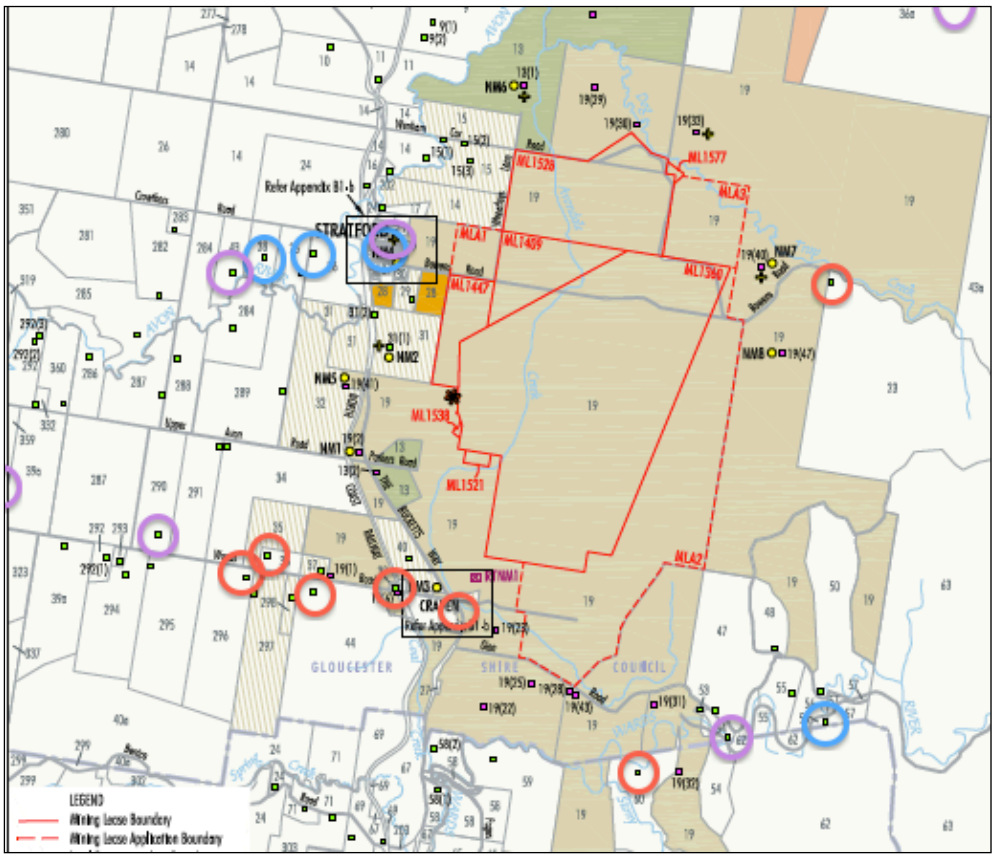
2 Stratford Mining Complex – Residents' Experiences

BGSPA spoke with a number of residents who live within the vicinity of the Stratford mining complex to ascertain what impacts the mining operations have had on them and how they view the proposed expansion of the mine.

Several of these residents were willing to provide a written statement. Others preferred to have their verbal statements recorded and attributed. Others, most notably residents of Stratford village, were unwilling to have their views recorded and attributed despite being very willing to talk about their experiences.

BGSPA does not present this as being either a statistically rigorous or exhaustive survey. However, it is indicative of the experience of residents. It is remarkable how similar is the experience of residents over a wide area and also how similar is the reporting of that experience.

The geographic spread of residents who reported experiencing intrusive noise nuisance is shown on the map below and statements provided by residents can be found at Appendix 2.



Key:
Red – Residential properties predicted to experience noise exceeding the PSNL
Blue – Residential properties not predicted to experience noise exceeding the PSNL, but which have complained of frequent intrusive noise from existing operations
Purple – Residential properties where the owners report experiencing frequent intrusive noise from existing operations, but have not lodged formal complaints

Virtually all of the discussions focussed on intrusive noise nuisance and/or dust, and its attendant impact on air and drinking water quality.

Perhaps the strongest impression gained from Stratford village residents was that they nearly all conveyed a sense of resignation bordering on despair. "We are not happy about it, we don't want it but there's nothing we can do about it", was a direct quote that seemed to sum up the general mood. The "it" referred to is, of course, the Stratford mining complex.

It was suggested that there is a general uneasiness within the village about speaking out too loudly. There seems to be a forlorn hope that if they "sit tight" and don't speak out, then the company may buy them out if it gets worse and they will be able to escape.

None saw any benefits flowing to Stratford from the mine but some felt that there might be benefits for Gloucester.

Another direct quote, indicative of the general mood was, "It's heartbreaking to see a peaceful rural area ruined".

Some commented on the disappearance of wildlife. Kangaroos are no longer seen grazing near the village and the birdlife, especially the parrots, has declined dramatically.

A notable observation made by several people, was that the "presence" of the mine in the valley is now much more obvious. The waste heaps and "rehabilitated" hills are more visible. There is more mine traffic on the roads.

A related observation was that the company's attitude has changed, become harder, less conciliatory. "They don't give a stuff," was one blunt observation. Another recounted how, at the SCPL briefing on the proposed expansion held in the Stratford Hall in November 2012, in response to his complaint about water quality, a senior SCPL employee retorted, "It won't matter what you do, it won't get you anywhere."

Most believe that this hardened attitude is reflected in the company's push to reintroduce 24-hour mining operations. The proposed return to 24-hour mining operations was unanimously opposed often with anger or horror. All related their experience of 24-hour mining when the Stratford main pit was being mined. "Hell" and "torture" were two of the descriptions used. Not one person was willing to believe that it would be any better this time around. "A pack of lies" was one description of the noise modelling contained in the EIS.

Intrusive noise nuisance was experienced over a wide area and at all points of the compass. There was little variation in the descriptions of the noise. It was usually described as being a constant low roar or rumble accompanied by the sound of heavy machinery operating under load. The nuisance is largely due to the constancy and nature of the noise rather than its volume.

There was some variation noted in the time of day when the noise nuisance was most intrusive. For some, it was essentially a problem at night while for others it was a problem during the day, particularly in the morning and late afternoon. For a few, it could occur at any time of the day and night.

Some residents reported sleep disturbance and attributed it to mine noise, because the noise was always apparent when they had been woken.

Intrusive noise nuisance from either mining or CHPP operations seemed to be less of a concern for village residents than for those living in the rural environs. Blasting noise and vibration was however, a bigger concern in the village.

It may be that the noise experienced in the village retains a significant high frequency component that masks the disturbing low frequency component. By the time it reaches the more distant residents, the high frequency component has been attenuated, making the "noise" more noticeable. Or it may simply be that many in the village now 'tune out" the mine noise.

Whatever the explanation, every person remarked, without prompting, about how peaceful it was during the recent three-week cessation of mining operations at Stratford. "As living in the country should be" was one comment. "Bliss" was another description offered by several people.

The complaints process was another area in which the experiences were essentially similar. Residents said that they were reluctant to complain when the mine first opened, choosing instead to "put up with it" given that it was to be only for a limited time.

Many have had occasion to complain over subsequent years but most have now given up complaining because the process is completely unproductive. "Complaints go nowhere", "No-one does anything", "What's the point, it just falls on deaf ears," "They always say they are operating within the approved conditions" are some of the reasons given as to why they no longer complain.

Overall, village residents seemed to be more concerned about dust than noise. All reported that dust had become much worse since the mine commenced operations. Some reported that the dust problem has become noticeably worse since the amount of coal railed from Duralie has increased. Many talked about a film of black dust on cars, furniture, washing and other surfaces. All remarked that water quality had deteriorated and that frequent cleaning of filters was needed to remove a build-up of black sludge. This was the cause of considerable distress for some. Many will be satisfied if SCPL pays for periodic cleaning of their water tanks and replacement of their filters.

Many expressed concerns about their health, with bronchial and respiratory problems being most commonly cited. There was genuine interest as to how many others in the village were reporting the same symptoms. Some reported increased stress levels and the need for prescription medication. While reluctant to point the finger at the mine, they had no other explanation to account for the condition.
With respect to the proposed expansion, as has already been mentioned residents are unanimously opposed to the return to 24-hour mining operations.

They are also unanimously opposed to bringing mining closer to Stratford village. Mention was made about promises previously given and the people who made them. "There will be no mining west of Wheatleys Lane". "There will be no mining within two kilometres of the village."

Many residents have "had enough" and would very much welcome the opportunity to leave. Most cannot afford to do so. Some are too attached to family history to contemplate leaving.

Not one person welcomed the proposed expansion.

The information presented in this section confirms analysis considered in detail in other sections of the submission, particularly that dealing with noise.

The intrusive noise impacts experienced by so many over such a large area is very real and should no longer be dismissed or ignored. The attempt to hide behind PSNL and noise monitoring based on inadequate modelling and assessment criteria and failure to apply the NSW Industrial Noise Policy's recommendations should no longer be tolerated.

The concerns that Stratford village residents have about water quality and their health are very real and should be investigated. The callous disregard with which they consider themselves to have been treated is itself, a significant stressor for some.

Many residents are asking for little more than to be treated with respect and to have their concerns taken seriously.

Recommendations:

That a health audit be conducted, funded by the proponent, for all residents living within 5 km of the Stratford mining complex.

That the domestic rainwater tanks of all residents living within 5 km of the Stratford mining complex be tested for heavy metal and hydrocarbon pollution. Testing to be overseen by the Department of Health and funded by the proponent.

That a program of regular domestic rainwater tank cleaning and replacement of filters be implemented for residents of Stratford village. Program to be managed by Gloucester Shire Council and funded by the proponent.

See Section 3a for recommendations relating to noise and blasting.

3 Mine Expansion Impact Issues

(a) Noise & Blasting Assessment

Intrusive noise disturbance from the Stratford mining complex is a pivotal issue for consideration of the proposed expansion. For this reason, Gloucester Council commissioned an independent acoustic expert to assist its evaluation of the noise and blasting assessment contained in the EIS.

Intrusive noise disturbance from the Stratford mining complex is a significant problem for neighbouring residents, many of whom are members of BGSPA. We have therefore provided a comprehensive analysis of the noise impacts arising from current operations and a detailed critique of the noise assessment provided for the proposed expansion.

BGSPA contributed to the development of Council's submission, hence there is considerable commonality between the content of the Council's submission and that of BGSPA. Nevertheless, there are differences in detail between the two positions, including the recommendations and proposed conditions of consent.

Stratford Coal Mine - Current Experience

Noise disturbance occurs over a wide area and would seem to be greater than that predicted by previous noise modeling. The complaints record suggests that the disturbance is actually getting worse.

Residents impacted by intrusive noise nuisance report that it can be highly variable despite identical weather and operating conditions. They find SCPL's apparent inability to identify the specific source(s) of noise disturbance or explain its variability to be an additional irritant.

The Complaints Handling Procedures are seen to be completely inadequate focussed more on 'managing' the complaint and the complainant rather than investigating the complaint to finality by identifying the noise source and implementing mitigation measures. There is rarely any explanation of investigative and corrective measures undertaken and inadequate follow-up with the complainant to assess whether the problem has been resolved.

It is apparent from discussions with residents that the number of complaints recorded does not accurately reflect the full extent of noise disturbance they experience.

Refer to Section 2 and Appendix 2 for more discussion of residents experiences.

Stratford Extension Project – Environmental Impact Statement

Overview

The concurrent operation of widely separated pits within the project area would result in a substantial increase in the area potentially affected by intrusive noise. This will be greatly exacerbated if the proposed return to 24-hour mining operations is approved.

Noise above the Rating Background Level (RBL) is predicted to occur over an area of some 80 square kilometres. Night-time noise levels in Year 7 are predicted to exceed the Project-specific Noise Level (PSNL) over an area of 49 square kilometres.

The data presented in the EIS is technically complex and confusing. It is impossible for a landholder to assess the actual extent of noise intrusiveness that would be experienced e.g. its loudness, timing and duration.

The inclusion of Table 4-10, which simply presents a relative scale of various noise sources without explanation or attempt to relate this to the industrial noise assessment criteria, together with the statement on Page 4-50 that "hearing 'nuisance' for most people begins at noise levels of about 70dBA", is seriously misleading. Together these suggest that the noise impacts of the project would be relatively benign, a situation that does not accord with current experience.

As noise arising from SCPL's current operations has such an intrusive impact on neighbouring residents, it is completely unacceptable that an ***interna****l* peer review has been offered as validation of the Noise and Blasting Assessment presented in the EIS. Nothing less than a comprehensive, review by an independent Acoustic Consultant should be accepted.

Recommendations:

Noise & Blasting Assessment should be re-presented with noise impacts identified in terms that a layperson can understand. Actual noise impacts to be assessed for all landholders within the area above the RBL noise contour.

The re-presented Noise & Blasting Assessment should be independently peer reviewed at SCPL expense by a fully independent Acoustic Consultant.

Noise Modeling & Assessment Criteria

The large number of complaints concerning intrusive noise, lodged by residents located in areas where noise modeling and monitoring for current operations predict noise impacts below the current PSNL, suggest that either the modeling is not a good indicator of potential noise impacts or the monitoring is not accurately recording noise levels.

Residents have no confidence in the noise modeling presented in the EIS.

At Page 4-52 it is stated "In those cases where the INP project-specific assessment criteria are exceeded, it does not automatically follow that all people exposed to the noise would find the noise noticeable or unacceptable." This suggests a clear uneasiness about ability to meet the PSNL and an attempt to persuade the reader to the view that exceedances won't really be a problem. It would be equally valid to state that possibly all people exposed to project-specific noise which does not exceed assessment criteria may still find the noise to be noticeable or unacceptable.

The EIS claims that the predicted project noise has been comprehensively evaluated and assessed in accordance with the guidelines contained in the NSW Industrial Noise Policy (EPA 2000) (INP).

The INP acknowledges that where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest it can cause greater annoyance than other noise at the same noise level (INP Page 28).

Accordingly, the INP states that where a noise source does contain such characteristics, an adjustment is to be applied to the source noise level received at an assessment point before it is compared with the PSNL to account for the additional annoyance caused by the particular characteristic.

The characteristics of noise generated by mining operations include tonality, intermittent and low frequency noise. In fact the overall noise level experienced by neighbouring residents would be driven by low frequency noise, given that high frequency noise is well attenuated

by air. There is no indication in the EIS that any investigation or assessment has been undertaken of the characteristics of noise that would be generated in the extended mining operations, and no indication that any relevant adjustment has been made to the noise data to account for additional annoyance.

If this has not been done the EIS fails to satisfy the Director General's Requirements (DGR).

In relation to low frequency noise in particular, no data is provided that uses C-weighted measurements. The use of A-weighting tends to significantly devalue the impacts of low frequency noise in particular. Although the use of A-weighted data is commonly mandated, the INP notes that C-weighting is more responsive to low-frequency components of noise within the audibility range of humans.

The INP therefore recommends that both A- and C- weighted noise levels should be measured and assessed over the same time period to determine whether an adjustment for low frequency noise should be made (INP, Table 4.1).

The characteristics of noise generated by mining operations referred to above, typify a high proportion of the complaints made about noise from the existing SCM operations. The lack of C-weighted measurements in the current SCM noise monitoring program may go some way toward accounting for the discordance between predicted/measured noise impacts and the experience of neighbouring residents as recorded in the complaints register.

As no C-weighted data is provided in the EIS there can be no confidence that the predicted noise impacts of the extension project have not been underestimated due to the devaluation of low frequency components. (The use of an A-weighted filter in SCPL's current noise monitoring provides inadequate data for this purpose because such filters progressively de-value frequencies below 500Hz).

The operational noise modeling considers meteorological effects, surrounding terrain, distance from source to receiver and noise attenuation. It does not include any analysis of the indications of noise nuisance reported by residents through the complaints process beyond noting the number of complaints and complainants.

Notwithstanding the limiting of complaints through progressive acquisition of affected properties and application of compensation agreements that include restrictions on lodging complaints, the location of residents who have reported noise nuisance provides useful information on actual noise impact, but that information has not been taken into account.

The EIS acknowledges that the typical meteorological conditions experienced in the Gloucester Valley dictate that wind and temperature inversions need to be factored into the modeling to assess the noise impact of the mine operations on nearby residents. It is not stated whether the Operational Noise Contours presented in Figures 4-16, 4-17 and 4-18 reflect these typical meteorological conditions.

Recommendations:

The Noise & Blasting Assessment should be re-presented with comprehensive assessment of noise characteristics that would be generated by the project including presentation of C-weighted data.

Analysis of noise nuisance reported by neighbouring residents should be factored into the noise modeling.

Project-specific Noise Levels (PSNL)

The establishment of the PSNL is dependent on the background noise level (RBL). The INP adopts 30dBA as a default minimum RBL and this level has been deemed to be appropriate for the project. However, independent monitoring has shown the actual background noise level in the rural areas surrounding the SCM to be significantly lower. This would obviously have an impact on the PSNL and the sleep disturbance criteria identified for the project, which should in fact be lower than those presented in the EIS. This has the effect of increasing the areal extent of the noise exceedance zone and the number of properties affected.

It is also noted that ENM, the software used for the noise and blasting assessment, is somewhat outdated and has been superseded by newer applications that are progressively being adopted because of their greater accuracy. There is some evidence to suggest that there are discrepancies in the predicted noise levels obtained with ENM and the more modern software. As the noise modeling presented in the EIS has relied on the ENM software, it is likely to have higher margins of error than could have been achieved through use of newer alternatives.

Concerns have been expressed about the amount of mitigation that would need to be undertaken to achieve compliance with the PSNL. Error margins increase with the number of specific mitigation measures to be undertaken which prompts doubts about how realistic this is from both an operational and a regulatory perspective.

Taking all these factors together, it is apparent that there is a high likelihood that the noise impacts are being seriously under estimated. There is a default margin of error of 2dBA in the calculation of the PSNL. If the actual RBL is say, 28dBA and both the software and mitigation measures each result in a 2dBA discrepancy and if the low frequency understatement as a consequence of not taking C-weighted measurements is included, there is a potential total understatement of 10dBA.

Turning to current experience, if monitoring is accurate and the approved PSNL is not being exceeded as asserted in the EIS (Page 4-50), it is apparent that significant noise disturbance occurs at levels below the PSNL. This is likely to be a function of the overstated RBL and the low frequency character of the noise.

The INP stresses that the PSNL should not automatically be interpreted as the conditions of consent and that community views should be taken into account in setting noise limits. In this instance, the strongly held community view is that the PSNLs for existing operations at the SCM have been set too high, and there is a strong case for lower PSNLs to be applied to the extension project.

Recommendations:

The Noise Assessment should be re-presented with comprehensive assessment of noise characteristics that would be generated by the project including presentation of C-weighted data.

The Noise Assessment should then be independently peer-reviewed at SCPL expense by a fully independent Acoustic Consultant.

Mitigation

A considerable number of project noise mitigation measures are proposed (EIS Table 4-13). Despite these proposed mitigation measures, noise modelling indicates that operational noise would exceed the PSNL at 16 neighbouring residences, six of which are not subject to

a landholder agreement concerning noise impacts (EIS Table 4-14). An additional 18 privately owned receivers with predicted PSNL exceedence are shown as being subject to an existing Landholder Agreement, but a proportion of those agreements were developed in the context of the existing operations, not the proposed expansion.

The DGR stipulate that when addressing reasonable and feasible mitigation measures regarding noise, vibration and blasting, the EIS must include ***evidence*** that there are no such measures available other than those proposed.

The EIS notes that although other more extensive noise mitigation measures may be technically possible, they are not considered by SCPL to be feasible and reasonable. It is conceded that, for example, some elevated night-time noise levels at some locations could be avoided by restriction of mining at the Avon North open cut and Stratford East open cut (in Years 6 to 11) to day-time only. However, those measures are rejected by SCPL on the grounds that they are not considered to be economically feasible. (EIS Page 4-54).

The lack of evidence in the EIS to support the assertion that mitigation measures beyond those proposed, such as restricted mining hours, are neither reasonable nor feasible clearly does not satisfy the DGR.

As previously mentioned, concerns have been expressed about the amount of mitigation that would need to be undertaken to achieve compliance with the PSNL. Questions have been raised as to how realistic this is from both an operational and a regulatory perspective.

The modelling of noise impacts has assumed that the proposed mitigation measures are in place, however there is no discussion within the EIS about the timetable for their implementation. It is noted that mitigation measures currently being implemented as a consequence of a review of noise impacts undertaken in 2010 have taken three years to implement. If the proposed mitigation measures for this project are implemented over a similar time frame, then projected noise levels during the first years of the project would have been significantly underestimated. Revised modeling should be undertaken to identify the noise levels to which neighbouring residents would be exposed until the mitigation measures are fully implemented.

Similarly, the EIS does not indicate when and under what circumstances the new XQ vehicle fleet would be deployed. Would it entirely replace the existing vehicle fleet or would it be reserved for night-time operations only and be deployed simultaneously with the older fleet?

The achievement of the PSNL is heavily dependent on the development of an extensive network of 6m high bunds along haul roads, the rail loop and around waste emplacement dumps. Here again, the issue of the low frequency character of the noise is of vital importance as the larger wave length at lower frequencies makes this type of acoustic barrier less affective at attenuating low frequency noise.

For discussion of proposed mitigation at residents who are subject to intrusive noise above the PSNL, refer to the section headed Noise Exceedance Zones.

Recommendations/Proposed Conditions of Consent:

SCPL should be required to provide evidence to support the assertion that mitigation measures beyond those proposed, such as restricted mining hours, are neither reasonable nor feasible.

SCPL should be required to provide evidence that proposed mitigation measures are realistic from both an operational and a regulatory perspective.

SCPL should be required to provide evidence that mitigation measures would be implemented in time to enable the PSNL to be achieved from commencement of the project.

The XQ fleet must be deployed from project commencement. Only the new fleet vehicles and machinery should be used in connection with the new operations. The older vehicle fleet should be retired upon completion of the BRNOC operation.

SCPL to be required to provide evidence to confirm that proposed noise bunding would attenuate low frequency noise.

Noise Exceedance Zone

Properties "where intrusive noise emissions are predicted to exceed the project-specific criteria" are divided in the EIS into two main categories depending on the "degree of exceedance":

- Properties predicted to experience intrusive noise levels <5dBA above the PSNL area are included in a Noise Management Zone, and properties predicted to experience intrusive noise levels >5dBA above the PSNL are included in a Noise Affectation Zone.

- Properties in the Noise Management Zone are further divided into two classes - exceedances of 1-2dBA being described as "marginal", and exceedances of 3-5dBA being described as "moderate". (It is not clear whether a property located between the 2dBA and 3dBA contours would be regarded as being marginally or moderately impacted).

It is proposed to use this categorisation to determine the company's obligations to affected property owners.

No additional mitigation measures are proposed for residences where the modeling predicts intrusive noise impacts below the PSNL.

For properties in the "marginal" sub-category of the Noise Management Zone measures beyond existing mitigations that would be taken by SCPL would be limited to: noise monitoring in the project area; prompt response to complaints; and refinement of on-site management and procedures *where practicable.*

For properties in the "moderate" sub-category of the Noise Management Zone measures to be taken by SCPL would also include the implementation of "reasonable and feasible" acoustical mitigation at the receiver property, such as double glazing.

Only for properties in the Noise Affectation Zone – i.e. those with exceedance >5dBA – would there be an obligation on SCPL to negotiate agreements with landowners.

SCPL does not propose the inclusion of an obligation to acquire any property at the owner's request - regardless of the level of exceedance of the PSNL - in the event that other mitigations are inadequate.

The development consent for the BRNOC imposes an obligation on SCPL to acquire the land under specified conditions if requested by the landowner, in circumstances where intrusive noise exceeds the noise criteria by 5dBA. (Condition 6.4B - Appendix A2 of Appendix C of EIS). Similar criteria should be adopted for this project.

We consider the categorisation of properties according to degree of exceedance of the PSNL to be an unacceptable approach for the reasons listed below:

- The PSNL is determined to be the level which operational noise is not to exceed. It is in effect, a line in the sand. The EIS itself describes all exceedances as "intrusive noise emissions".

- Neighbouring residents currently report intrusive noise disturbance which periodic monitoring finds to be below the approved PSNL.

- As has already been discussed, there is a margin of error of 2dBA in the calculation of the PSNL and there appears to have been no allowance made for the low frequency character of the noise.

- While a 1 to 2dBA increase in overall sound pressure may not be noticeable to some people, others may find it intolerable. A difference of 3dBA corresponds to doubling the power of a noise source. This would be readily noticeable by most people and is a significant exceedance.

- The scope for noise impacts to have been underestimated suggests it is highly likely that the actual impact at properties where only "marginal" or "moderate" exceedances of the PSNL are predicted would be greater than indicated.

For these reasons, we strongly hold the view that there should be a single Noise Exceedance Zone. Residents within this Noise Exceedance Zone should all be subject to the same management procedures and entitled to receive the same mitigation measures. Furthermore, there should be severe and escalating penalties imposed on SCPL for each breach of the PSNL.

The management procedures should include: on-site noise monitoring (including C-weighted measurement); prompt response to complaints; immediate suspension of activity that is causing the noise nuisance until the problem is rectified; and refinement of on-site mitigation measures to avoid a repeat incident.

The mitigation measures to which residents should be entitled include: acoustical mitigation such as enhanced glazing, insulation and air conditioning. SCPL should also be required to negotiate a "compensation agreement" with residents in the Noise Exceedance Zone prior to project commencement.

It needs to be noted that properties predicted to experience intrusive noise over a substantial part of the property area, but not including a residence, have not been included in the summary tables listing receivers where PSNL exceedances are predicted to occur. There are around seven privately owned properties, not subject to a Landowner Agreement, where exceedances would affect more than 25% of the property area.

The Noise Criteria in the SCM Development Consent and the BRNOC Development Consent both stipulate that the noise criteria must not be exceeded "at any residence on privately owned land ***or on more than 25 percent of any privately-owned land****".* Because of the likely impact on the use and value of the affected properties the same requirement should be applied to the currently proposed project.

Recommendations/Proposed Conditions of Consent:

There should be a single Noise Exceedance Zone. All residents within that zone should all be subject to the same management procedures and be entitled to receive the same acoustic mitigation measures, including enhanced glazing, insulation, air conditioning etc, and / or enter into a Landowner Agreement.

Where intrusive noise levels exceed the PSNL by 5dBA or more, residents should be deemed to be within a Property Acquisition Zone where SCPL must acquire the property upon the request of the owner.

The same provisions that apply to private residences where the PSNL is exceeded should apply to all properties where the exceedance affects more than 25% of the area of the property.

Owners whose properties are outside the area where PSNL exceedance is predicted but nevertheless experience significant noise nuisance should be entitled to have on-site noise monitoring conducted, with the cost born by SCPL. Should that monitoring confirm PSNL exceedance at that location, the property should be deemed to be within the Noise Exceedance Zone and the owner entitled to the additional mitigation measures available to properties in that Zone.

Blasting

As mining operations have moved progressively closer to Stratford village, there has been a large increase in the number of formal complaints about the impacts of blasting. Nine blast complaints were recorded in 2010, twenty-two in 2011, and forty-one in 2012 (to October).

SCPL proposes to limit the size of blasts in the Roseville West extension pit to MIC 400kg, but it is not possible to judge whether that may mitigate the impacts currently reported by Stratford residents as no information about current blast sizes is provided in the EIS.

Modelling of impacts of blasting in the proposed Avon North and Stratford East pits relies on data from blast monitoring points located west of the current operations. There are no blast monitors located near the proposed new pits, which would be excavated in strata that differ from those near the existing monitors. This introduces a level of uncertainty in the modelling that is not reflected in the predicted levels (and locations) of impacts.

There is no reference in the EIS to the recommendation contained in the Australian Standard (AS2187: Part 2, 2006) that a lower Peak Vector Sum vibration velocity of 2mm/s be considered as the long term regulatory goal for the control of ground vibration. As the project would lead to blast-induced vibration impacts at properties not currently affected by blasting, it would be appropriate for the 2mm/s criterion to be applied to the new pits.

Even using the higher criterion of 5mm/s PVS, the blasting impact assessment indicates that vibration (and/or air blast criteria) would be exceeded at six private properties that are not party to a landholder agreement if blasts in the Avon North and Stratford East open cuts are above MIC 680 kg. To avoid this exceedance and the consequent impact on residents of those properties, the conditions of consent should preclude the use of charges exceeding MIC 400 kg in those pits.

The conditions of consent for the BRNOC operation provide that if requested by the owner of a residence within 2km of the blasting locations, SCPL is to arrange and meet the cost of an inspection of the material condition of any structure on the property. This requirement should also apply to any blasting undertaken in connection with the proposed expanded operations. Landowners must be able to request that inspections be undertaken before blasting operations commence in the new areas and at any stage during the project if they believe structural damage has occurred as a result of the blasting.

Recommendations/Proposed Conditions of Consent:

The ground vibration criteria applied to blasting in the proposed new pits and the proposed extension of the Roseville West pit should be a PVS of 2mm/s.

Blast size limits in the Avon North and Stratford East open cuts should be limited to MIC 400kg, which is the limit applied to the Roseville West extension and the Bowens Road North open cut.

Where a residence on a property is within 2km of the blasting location, SCPL should be required to arrange and meet the cost of preparing a material condition report in relation to any structures on the property if requested by the property owner.

Monitoring and Compliance

There is no detailed discussion of noise and blasting monitoring presented in the EIS. The project environmental monitoring regime is summarised in Table 7-3.

There are currently no noise or blasting monitors in the south-east quadrant of SCM's operational footprint, nor does the EIS propose that any monitoring be conducted in this quadrant. Given that the Stratford East open cut would bring the scale, extent and intrusiveness of mining operations so much closer to neighbouring residents, this is a serious omission that must be rectified.

The transparency of process demands that a comprehensive monitoring regime be implemented that includes regular monitoring by a consultant that is independent of both SCPL and the authors of the EIS Noise & Blasting Assessment (SLR Consulting Australia P/L). A further independent environmental audit should be undertaken as part of the annual review of environmental performance.

Recommendations/Proposed Conditions of Consent:

Noise and blast monitoring points should be established to the north-east of the Avon North pit and to the south-east of the Stratford East pit.

A fully independent noise monitoring regime to be implemented as a condition of consent.

Noise Management Plan (NMP)

The existing NMP, which it is proposed be applied to the expanded operations, is deficient in that it places no onus on SCPL's Environmental Officer to investigate and determine the ***source*** of noise that is the subject of a complaint. Examination of the complaints register from 1998 to 2012 reveals frequent instances where the source of the noise has not been identified or where the suggested source does not accord with the description provided by the complainant.

Compounding this, the NMP does not require any systematic analysis of complaints that may identify anomalous factors that are not reflected in noise modelling and the monitoring program. Patterns may emerge from analysis of location, time, and described character or the noise that could be applied in the design and implementation of mitigation measures. In this regard, it is important to note that operations at the SCM are variable. Some parts of the operation such as the CHPP operate most of the time and in a fixed location. However other activities that contribute significantly to noise levels, such as the stockpile dozer, operate on a highly variable basis. Operation of the stockpile dozer on various sides of the stockpile and at varying heights can lead to intrusive noise impacts over the duration of that activity at locations beyond those predicted by the modeled noise contours.

Recommendations/Proposed Conditions of Consent:

To provide for community input, the draft Noise Management Plan for the project should be presented to the Community Consultative Committee for comment before being submitted for approval.

3 Mine Expansion Impact Issues

(b) Health

The EIS, despite its extraordinary size, has few references to health. The Director General's Requirements do not include a Health Impact Assessment. The section labelled "Health" deals only with a potential increase in health infrastructure requirement related to increased population. This is seriously remiss.

The adverse affects of coal dust on both workers and community are well recognized, but there is no reference or discussion of this in the EIS. Nor are there specific criteria for particulate matter of PM2.5 or less which are known to be the most dangerous to health. Given the growing volume of evidence from studies conducted overseas, and from our experience here in Australia, these omissions appear to constitute a grave disregard for the government's duty of care for the population.

There have been many adverse affects from the Stratford mining operation on the people of Stratford and Craven over the past 17 years and further impacts will occur if the proposed expansion is approved.

The following factors are known to contribute to the adverse impacts of open-cut coal mining on health:

- Dust and Chemical Pollutants
- Water Contamination
- Noise
- Psychological Stress

Dust and Chemical Pollutants

The Stratford mining complex, as with all open cut mines, is responsible for dust and chemical pollutants produced by overburden removal; coal extraction, processing, and transportation; and rehabilitation, together with working diesel machinery and blasting. The National Pollution Inventory lists 24 toxic substances emitted from the Stratford coal mine (2010-2012). Unwashed coal is also transported from Duralie in open rail wagons for 20 km to the Stratford Coal Handling and Processing Plant (CHPP) passing within a few metres of many homes, particularly in Wards River village. The coal from Duralie is generally of inferior quality and is know to be high in sulphur content.

Coarse dust, which is obvious to the naked eye, can be observed on roofs of homes and cars in the villages of Wards River, Craven, and Stratford and also in Glen Road Craven where homes have a direct line of view across open paddocks to the CHPP. One must conclude that there are many more particles of fine dust, which are not observable and which travel to homes further afield.

Stratford is situated in a partially enclosed valley. Expert meteorologist, Martin Babakhan, has studied the geography and concluded that the high walls of the valley will circulate fine dust particles back into the valley, which is only 11 km wide at Stratford. He estimates the valley walls (Gloucester Bucketts) to be up to 560 metres high, while the EIS models the PM levels for this region using a height of 450 metres, which is actually the maximum height for the lower side of the valley. This would certainly affect the results for the estimated PM2.5 level projected in the EIS.

Health studies published as early as 1992 showed a link between asthma and open cut coal mining, so the potential for harm of this nature was known at least 3 years before mining at Stratford was approved.

Gloucester Medical Centre practitioners have reported a significant increase in the incidence of asthma, particularly in Stratford, over the years since the mine opened. A teacher at the public school in Stratford, which is now only 1.5 km from mining and blasting, reported to Gloucester Council more than three years ago that she was concerned that so many of her pupils repeatedly succumbed to upper respiratory related complaints. She had not encountered this in other schools where she had been teaching previously.

Local volunteers have just begun to measure lung function, oxygen saturation and blood pressure in residents living within 10 km of the Stratford Operation. To date 9 of the 43 persons tested in Stratford (i.e. 21%) showed impaired lung function.

Water Contamination

This is a rural area without access to treated water and one must conclude that this dust is collected in household water tanks. Some testing carried out 2 years ago by Macquarie University showed that all tank water was acid and several contained health endangering levels of metals such as copper and lead. Stratford Primary School now has regular testing of its tank water after dangerous levels of lead were detected in 2001. Regular tank cleaning and installation of filters has apparently mitigated this pollution, but no testing for carcinogenic BTEX pollution has ever been carried out, and these particles could still be present despite filters.

As a result of community pressure, Gloucester Shire Council undertook some water testing of residents' tank water two years ago. Unfortunately the testing sample was so small (5) that the results were not statistically reliable. Again, only heavy metals and ph were measured. This is the only 'official' testing that has been undertaken.

Neither the pupils at Stratford Primary School nor any of the residents in the vicinity of the mine have been offered health testing or monitoring of any kind.

Noise

Many of the effects of coal dust on health, like asbestos, take a long period of time to develop, and will effectively become a burden on the public health system some time down the track. However, other aspects of coal mining produce health stresses that have an additional and direct impact on health, and may also be of daily occurrence. Noise is probably head of the list. Noise should be studied in relation to both high and low frequency noise that vary in the harm caused.

The continual throb of the engines of the haul fleet vehicles and bulldozers both at the mine and the CHPP are nerve wracking. Some residents have sleep regularly disrupted. Coal trains passing close to a house can shake the building and its inhabitants. Many report that the coal train rolling stock creates more noise than other trains.

One resident at Stratford has reported that the bulldozer at the CHPP is the first thing he hears every morning when he wakes up. He begins every day with this stress. Investigation of noise nuisance experienced as far as 6 kms from the CHPP at Glen Road, Craven has suggested that the CHPP bulldozer as being the source of the noise.

Humans are very sensitive to the character of noise and while having a "tune on the brain" can be very irritating, having a distressing noise that cannot (or will not) be stopped, is damaging to mental health. Noise, by definition, is *unwanted sound* and that *unwanted* aspect is one element in the adverse impact of noise on mental health.

Low frequency noise (below 60 Hz) is not required to be measured, yet it can be transmitted through solids and is not suppressed by insulation. It can travel through hills. Though

frequencies below 20 Hz cannot be heard, sound waves/vibrations have a stressful effect on neural transmission in our brains and can damage the tissues of the wall of the heart, so the impact of noise extends also to physical health.

In addition to the sources of noise described above, blasting is carried out daily, a favoured time being 1:00 pm. A notice of this is posted at the Stratford Store, which is within a block of the Primary School whose pupils are subjected to the impact of noise and toxic dust associated with blasting during their school hours.

Some residents have become traumatized not only by the blasting but also by the anticipation of blasting which, due to the nature of setting off blasts, does not always occur at exactly the predicted time. The element of surprise is one of the factors that affect the mental health of these residents, together with the frustration incurred by the difficulty of having the company accept responsibility for damage inflicted on buildings.

Psychological Stress

In addition to the individual stressors discussed above, there is also the cumulative effect of being subjected to noise, the worry about damage to health and the worry of having one's whole lifestyle altered by the mining operations which are destroying familiar and loved landscape. This stress is exacerbated by the realization that government departments have regularly put the "economic value" of mining ahead of any other consideration.

The economic value of one's own home is of utmost importance to a resident whose home represents his/her major financial investment. When that financial investment is devalued because of proximity to a mine, then the owner is stressed to the ultimate. Some may have the opportunity of selling to the proponent, but there is no guarantee that a price above the current, depressed value will be paid. Usually the price obtained does not allow purchase of a similar property in a "mine safe" area.

Some residents fall outside the area of compulsory purchase, but the proximity to the mine means that property values have fallen and sales opportunities frozen; a lifetime investment has been lost, and there is no compensation. There are some aging residents who are pensioners, whose homes are off the beaten track, no public transport and no financial means to get help to run their properties, no compensation – how are they to manage? Would this not be stressful?

In addition to the impacts of Stratford Coal, there is the stress of anticipation of the impacts associated with AGL's licence to extract coal seam gas from this area and to build a gas compression plant adjacent to the CHPP. More noise, more air pollution, more health problems, more degradation of landscape, and more property devaluation. Retired psychiatrist and Gloucester resident, Dr Steve Robinson, has interviewed residents for whom the impact of the Stratford Mine has led to the reactivation of psychiatric complaints that had previously been successfully treated. Others without previous history have had their mental health threatened because of the helplessness and hopelessness of their situation.

Conclusion

It is obvious from discussion with the residents of Stratford and Craven, the reporting of local medical practitioners, and the results emerging from the newly established community lung function testing programme, that the health of this small community has been seriously affected by the proximity of open cut mining to their homes. Overseas research revealed this public health risk at least 20 years ago and Australian researchers are beginning to confirm this in Australian studies. This research should be widened and expedited by the government and include the residents of the Gloucester Stroud Valley.

Recommendations:

That a health audit be conducted, funded by the proponent, for all residents living within 5 km of the Stratford mining complex.

That the domestic rainwater tanks of all residents living within 5 km of the Stratford mining complex be tested for heavy metal and hydrocarbon pollution. Testing to be overseen by the Department of Health and funded by the proponent.

That a program of regular domestic rainwater tank cleaning and replacement of filters be implemented for residents of Stratford village. Program to be managed by Gloucester Shire Council and funded by the proponent.

That monitoring of PM 2.5 dust particles be carried out in Stratford village and at Gloucester Hospital, setting a maximum of an annual average of 5 micrograms. Results to be reported quarterly to the CCC. The data collected is to be made available online and in real time to enable individuals at high risk to take refuge in an air filtered room.

That mine vehicle running sheets be provided to the CCC to ensure that night time dust suppression water spraying is being carried out in compliance with consent conditions.

That a pollution reduction programme be implemented to enforce stringent exhaust emission controls on vehicles with the aim of reducing PM2.5 levels.

That rail wagons transporting coal be covered to ensure dust suppression during transport.

See Section 3(a) for recommendations relating to noise and blasting.

3 Mine Expansion Impact Issues

(c) Ground and Surface Water

Natural water systems in the area of the proposed Stratford Extension Project will be changed forever if the project is approved as presented. It is not possible to:

- dig three open cut pits up to 200m deep;
- disturb a surface area of 690ha of agricultural land;
- clear an extra 105ha of native vegetation (in addition to the area already cleared);
- create three final voids with a combined area of 138ha;
- fill these final voids with increasingly saline water for up to 500 years before stabilising;
- excavate and move 158Mbase cubic metres of waste rock;
- leave waste rock embankments up to 70m above the pre-mining land surface level;
- export 24M tonnes of coal from the site plus the water that it carries with it;
- mine to depths of 120m within 40m of Avondale Creek and leave it 140m deep;
- mine to depths of 120m within 40m of Dog Trap Creek and leave it 30m deep;
- divert 141 ha of water from one catchment to another;
- bury tonnes of acid forming waste rock;
- construct flood levees (bunds) to prevent the mine ever becoming flooded;
- pump up to 600ML each year of water for dewatering from the groundwater system;
- collect up to 25GL of saline water in permanent voids;
- irrigate revegetated areas with saline water;
- change the seasonal flow of creeks through diversions and dewatering;
- store all rainfall (3,003ML pa) on-site so that normal catchment flows are prevented;
- operate this water management above coal seam gas dewatering activity of 30 wells;
- disrupt the water hydrology within 3km of the potential Rocky Hill mine; and
- manage all this water in an area of complex geological faults and shear zones;

without major and irrevocable changes to the quantity and quality of surface and ground water regimes.

This in turn will adversely affect local and downstream water dependant vegetation, agriculture, fisheries, urban systems and potentially Taree Water Supply.

Yet the EIS concludes that “compared to the existing/approved total catchment area excised by the Stratford Mining Complex, the Project is not expected to result in measureable changes to downstream flows in Avondale Creek, Dog Trap Creek or the Avon River.” This conclusion cannot be accepted unless either the existing mine has not been properly assessed or the modelling for the proposed extension is flawed. Using a design flood of only 1 in 100 years is also unacceptable based on the increasingly extreme weather patterns we are experiencing.

Similarly the conclusion in the EIS for groundwater cannot be accepted. It states “there is expected to be negligible change in groundwater quality as a result of mining in the short-term. Furthermore, it is expected that groundwater quality will not be impacted by final void water quality post mining, as the final voids will remain groundwater sinks.”

BGSPA has major concerns with the approach and technical aspects of the conceptual groundwater modelling and therefore with the associated conclusions in the EIS Report and

Appendix A. These conclusions relate to both the proposed expansion project itself and the cumulative impact associated with nearby coal seam gas (CSG) and coal mining projects.

The following analysis and critique of the water issues is a summary of more detailed surface and ground water assessments presented in the submission by Gloucester Council.

Modelling

Technical issues relating to the conceptual groundwater model include:

- Modelling the Gloucester Stroud Basin is fraught with difficulties because of the structural complexity of the geology and the relationships between the aquifers. This complexity is well known and groundwater modellers have to make huge oversimplifications about the nature and hydraulic properties of the strata.

- The degree of vertical connection between aquifers is an area of significant disagreement between groundwater consultants. Vertical connection is a critical issue in groundwater modelling with AGL arguing that the connection is minimal. The proponent's consultants say they agree with AGL on this issue, but they clearly include significant vertical connectivity in their model. As well, no models that we are aware of have even tried to consider the effect of the extensive shearing and faulting.

- Clearly open-cuts up to 200 metres deep provide direct connection between aquifers to that depth. There are also major questions about the quality of construction and government regulation of the huge number of exploratory bores and AGL's future production bores drilled more recently (with a significant number having been fracked) as well as bores drilled since coal exploration started in the 1960s/1970s.

- The model used for the EIS appears to only consider periods of permanent base flow in watercourses, as groundwater contours do not drop below streambeds. However, the consultants accept elsewhere that the streams are ephemeral. Critical conditions for say, riverine vegetation and vegetation accessing groundwater when there is no surface water, will occur during drought sequences both during a particular drought and between droughts and these are not assessed.

- For the proponent's impacts alone, no consideration is given to the future expansions of new open-cuts that can certainly be expected both to the north and south.

- For cumulative impacts due to the development of the AGL gas project and the Rocky Hill coal project, no information is provided on the quantity of water abstracted. Yet there are to be CSG Stage 1 production bores across the Stratford mining lease and the Rocky Hill proposed lease area contributing to a maximum drawdown in potentiometic head of up to 1,700 metres.

BGSPA notes and recommends that:

- The veracity of the conceptual groundwater modelling used in the EIS is questionable and should be reviewed by Government regulators and independent experts.

- The cumulative impacts on groundwater of the Stratford extension project, the Rocky Hill project and particularly the AGL gas project, are highly significant. Related impacts on the ecology and other beneficial uses, such as private wells in Stratford, are therefore also potentially highly significant and should be re-evaluated.

- None of the individual project proponents (Yancoal, GRL and AGL) can adequately assess the cumulative impact of the projects because they are each using different data and different models to suit their own purposes. There needs to be a comprehensive and integrated groundwater modelling study undertaken by an independent steering committee, before any further approvals are given.

Voids and Embankments

The proposal that three voids be left at the end of mining operations is totally unacceptable. These voids permanently change the groundwater system and are used as sinks for contaminated surface water flows. The water in them will be totally un-useable for any human, agricultural or environmental purpose and poses a community health and safety risk that must be prevented.

According to the EIS, the polluted water in the voids will remain at a level lower than the current water table. As well as this being a surprising conclusion intuitively for an area that will be subject to extreme rainfall events and flooding in the future, it is also inconsistent with the conclusions drawn in the EIS for the neighbouring Rocky Hill coal project.

There are major concerns with leaving a void containing polluted water. The water will have a high salinity, contain numerous heavy metals and will only be about 3m below the design spill level. It would be a major environmental disaster if this water spilled into the Avon River.

If the water level in the voids is lower than the natural water table as predicted, then it will be a sink for groundwater as indicated. This will lead to the flow of groundwater from surrounding shallow aquifers over a very long period, which will reduce the availability of groundwater for other users. However, this is likely to be the outcome of dewatering activities by Yancoal and AGL over a shorter time frame in any event.

All pits and voids should be refilled with overburden as mining progresses. Final catchment watersheds must be designed and constructed to the satisfaction of the appropriate State Government regulator so that the system reverts to natural flow regimes. There is no justification, other than company profits, for voids and embankments to remain and this is demonstrated in the proposed Rocky Hill mine, where there will be no final voids.

Impacts on Creeks

The EIS states that the open cuts will be placed no closer than 40 metres to the creeks. This appears to be the plan to avoid any significant impacts from dewatering activities. The groundwater modelling indicates that there will only be small drawdowns in the vicinity of the creeks.

However, this is based on an analysis that appears to assume average flows will always occur in the creeks, despite the EIS acknowledging that the creeks are ephemeral. During very dry periods, it would be expected that creeks will be dry for long periods with no base flow. Riverine vegetation is likely to be groundwater dependent at these times. Drawdowns due to mine dewatering are likely to cause the water table to drop well below the creek bed.

It is difficult to believe that a 200 metre deep pit 40 metres from the creek, will not have a very significant impact on the creek.

This is even more likely when a future pit is excavated to the north, in the event of future expansions by Yancoal, and/or the AGL gaswell field is developed. This is likely to have a major impact on the health of riverine vegetation, which currently appears to be in reasonable condition along Dog Trap Creek. If vegetation dies and there are periods of

increased flows in the creeks due to increased catchment areas as proposed, major erosion of the bed and banks can be expected.

Eastern diversions above the mine area take runoff and send it north and south of the site rather than allowing the water to proceed down its natural creek line. This type of diversion would not be approved in a farming or urban landscape but can be approved for a mine even though it changes the natural hydrology. In this proposal, 27% of Avondale Creek and 16% of Dog Trap Creek catchments are excised from the Avon River system because this water is collected on site and never returned. At the same time water is to be diverted to other sections of the tributaries. All this permanently changes the hydrology.

It is illegal to contain all water on a farm - only 10% of rainfall can be stored on site. This is known as a 'harvestable right' and is designed to ensure that water users down the river or creek can have access to natural water flows. The proponent argues that it should be exempt in order to achieve its "no discharge of polluted water policy". However, this will result in the downstream water regime being damaged. The Stratford East Dam and the Return Water Dam should not be exempt (as claimed in the EIS) because they are primarily for storing 'clean' water for irrigation, mine use, and possible drought supply downstream.

The extent of water diversions and the on-site retention of all water must be reconsidered to enable more natural creek hydrology regimes to be maintained. Water into the Stratford East and Return Water Dams could be better managed so that it is of suitable quality for release downstream and the licence for these structures should require water to be released into Avondale Creek equal in volume to 90% of the rain falling on the mine site per year.

Adequacy of Water Monitoring for Quality and Quantity

It is apparent that there are already significant water quality issues in this catchment. What is not apparent is how much of this is natural, and how much is attributable to the various land users - particularly the mine. If there is no natural benchmark (as it seems), then at least a long term monitoring program needs to be conducted to assess trends and causes.

As part of the requirement for a new, integrated water modelling of the valley prior to any approvals, there needs to be a re-examination of historical data from the 1994 EIS and 1981/1982 sampling program to examine any potential changes in water quality characteristics since the commencement of mining activities. Further recommendations on water management may be necessary on the basis of this re-examination.

Independent monitoring of water quality and quantity for the life of the mine and for a specified period following its closure must be a condition of approval. (This practice should be adopted for all mines.) The monitoring should be at the expense of the proponent and should occur at strategic locations including:

- within the mine site including outfalls from rehabilitated, partially rehabilitated and active waste emplacements;
- all storages within the mine area;
- any discharge points;
- upstream and downstream from the mine site in the Dog Trap and Avondale Creeks and the Avon River; and
- all areas where irrigation with mine water is conducted.

Conclusion

This proposed expansion of mining operations will substantially increase the negative impacts on the water regime in the Avon River and further into the Gloucester and Manning River systems. The existing impacts are not well understood and certainly not managed for sustainability.

The fact that there will be unknown cumulative impacts from this extension, the proposed Rocky Hill coal mine and the over-arching CSG project on water quality and quantity means that more information is required before approvals can be considered. An integrated, whole of valley, model needs to be developed so that the impacts of all proposals can be considered at the same time. The outcomes then need to be checked against all appropriate Government Policies including the Groundwater Modelling Guidelines of the National Water Commission and the NSW Government's Aquifer Interference Policy.

The current piecemeal approach to approvals for water extraction and pollution by individual developments is unacceptable.

Recommendation:

That an integrated study be undertaken by an independent steering committee to assess the cumulative ground and surface water impacts of the Stratford Extension Project, the Rocky Hill Project and the Gloucester Gas Project. The study should be funded by all three proponents and include the total area of the Gloucester Stroud Valley that will be impacted by these projects. No project approvals to be given until this study is completed and impacts assessed.

3 Mine Expansion Impact Issues

(d) Alternative Land Use

A Sustainable Vision for Gloucester

There is a major conflict in regional development in NSW. Big businesses, including mining companies, strip wealth from regions. They do this by transferring the inherent value of local production to those who transport, process and market the produce, and to those who own the company. In most cases these people do not live in, or even near the source of production.

Mining exacerbates wealth stripping by not compensating communities for the full cost of its impacts. Mining companies are not required to compensate residents for the negative impacts of their activities - falls in property values, physical and mental health problems and environmental degradation. Mining can also severely affect traditional regional industries such as agriculture and tourism. These impacts are largely ignored and may last forever.

In the Gloucester region we still have a clear choice.

Either

a continuation of laissez faire development of extractive industries which take from our community, with little genuine compensation for their true immediate costs or consideration of their cumulative or long term impacts.

or

a coordinated and strategic approach to Regional Economic Development focussed on industries that are capable of providing regional and national wealth indefinitely and that do not preclude future land use options.

Our vision is for a vibrant community based on industries that capitalize on our natural strengths – our scenic beauty and natural heritage, our benign climate, our reliable water, our agricultural heritage and our proximity to major population centres. That is, an alternative approach to regional economic development based on agriculture, tourism, recreation, services and smart industries.

Agricultural Losses from Mining

A significant area of farming land has been purchased by the three companies involved in the development of coal and coal seam gas projects in the Stroud Gloucester Valley. The consequences of this are a loss of agricultural production, a loss of the rural culture, and the upheaval and dislocation to the lives of families having to sell out. An estimate of these areas is:

- Yancoal - a total area of 4,000ha in about 55 properties of which about 1,400ha is used directly for mining, 800ha for biodiversity offsets and the rest is potentially for cattle grazing in some form;
- GRL - a total area of 2,200ha in about 35 properties of which about 745ha will be used directly for mining, 100ha for biodiversity offsets and the rest is potentially for cattle grazing in some form; and
- AGL - a total area of 250ha in about 3 properties of which about 50ha is used directly for mining at this stage, 0ha for biodiversity offsets at this stage and the rest is potentially for cattle grazing in some form.

As the mining land and the offset lands are totally lost to agricultural production, this is a loss of approximately 3000ha of agricultural production. The other 3500ha of land owned by the

mining companies is used in various ways so it can be assumed that production is 50% of full potential.

NSW Department of Primary Industries data suggests that beef production productivity in the Gloucester area is approximately $250 per hectare per year. Therefore, losses are approximately $1.2mill per year.

Another way of calculating this is that Stock Agents and Council saleyard figures suggest that there has been a local reduction in cattle sales of 10%. NSW Agriculture figures indicate that the cattle market in the Gloucester LGA is worth $30m to NSW or $14m locally per year. A 10% reduction is about $1.4m per year.

Employment for beef production in Gloucester is approximately 120 people. A 10% reduction in employment affects approximately 12 people in the Shire. However, as the mining companies have purchased over 90 properties and most of this would result in a loss of agricultural employment, it could be assumed that the employment losses are at least 50 people.

To this must be added the social and economic costs arising from the dislocation of 90 families.

Regional Food Production

Gloucester is well positioned to develop a regional economy based on food production, favoured as we are by our natural advantages of climate, water availability, soils, proximity to major markets, land values and agricultural expertise. Agriculture in Gloucester is also likely to be advantaged by climate change.

A local community group, The Gloucester Project (TGP) has recognized the local potential for agricultural development and has received substantial NSW government financial support to advance this regional economic development approach based on agriculture.

TGP's strategy is based on the premise that more localised economies generate significantly more regional economic and employment growth than the globalized approach of modern large businesses. This premise has been clearly demonstrated in other places.

To date, TGP has developed a demonstration market garden, run certified education courses, and developed a grass-roots grower's network that includes 50 individual growers. Sixteen of these growers are already selling produce and looking to develop their commercial potential. TGP was a founding force behind the successful Gloucester Growers market, the Gloucester Garlic Growers cluster, and is developing an integrated system of food growing, marketing, sales and distribution based on high value horticultural produce.

Tourism and Recreation

Considering the importance of tourism to the local economy of Gloucester it is a major omission in the EIS that the impact of mining on tourism has not been considered.

The Gloucester region's tourism value is directly linked to its scenic beauty and natural and agricultural heritage. Gloucester is the closest town to the Barrington Tops and has long promoted itself as being the "basecamp" to the Barrington Tops. The World Heritage listing of the 'Tops' almost 30 years ago consolidated this unique position. The National Trust has also listed the Vale of Gloucester as a 'significant heritage landscape.'

Domestic overnight tourism is now worth over $30 million annually to Gloucester. This figure increases by $15-$20 million if day-trippers are included. The region has a strong skew to

nature-based holidays: 3 times the NSW state average for camping and picnics and 2.5 times the NSW state average for bushwalking/rainforest walks.

Tourism is a sustainable industry. It provides employment and growth for regions like Gloucester. Tourism currently employs about 220 people. One local operator is celebrating 30 years of adventure tourism in the region. The region's scenic beauty and natural landscapes are essential to Gloucester's tourism draw. Environmental tourism (camping, walking, rafting, adventure) is an important segment of the total tourism sector and is dependent on maintaining a pollution free environment. Therefore mining impacts such as poor air quality, reduced visibility, water pollution, loss of habitat, noise, increased heavy vehicle traffic and the landscape scar of overburden dumps are all detrimental to a sustainable tourism industry. The negative image of mining in the valley will last long after the short-term exploitation of the coal seams is finished.

The regional economic development model proposed by TGP is a perfect fit with food tourism - the latest trend in experience-based travel. This trend was recognized by Essentially Barrington, a group of Gloucester farming and food businesses that has been bringing thousands of tourists a year to Gloucester for more than a decade. Food tourism is identified in Gloucester Shire Council's Community Strategic Plan as an opportunity for the Shire. Gloucester also hopes to contribute significantly to the NSW Government's target of doubling overnight tourism expenditure by 2020.

Smart Industries and Services

Gloucester already has significant services and light industry sectors. A number of significant light industrial businesses are based in Gloucester. Services, government, health, manufacturing and building sectors provide 56% of Gloucester's employment. By contrast, employment in current mining activities provides just 5% of local employment.

Industry and services are thriving in Gloucester without mining. Mining may provide a short-term boost to some industry and service businesses, but there is a negative impact too. Many businesses are struggling to retain skilled staff because they can't compete with the wages and conditions offered by the mining sector.

The Tree Change Phenomenon

After several generations of population migration from the country to the city, a decade ago we witnessed the beginning of a movement from the cities back to the country - the so-called "tree-change" phenomenon. This was widely acknowledged by industry and government as being beneficial because it reduced demand for resources and infrastructure in the cities and brought economic renaissance to rural and regional centres.

From 2000 to 2005, Gloucester was a prime tree-change destination. Demand for rural properties and life-style acreages drove up property prices and led to the development of a number of residential subdivisions on the fringes of Gloucester. During this period the township underwent a renaissance, fostered largely by the vibrant café and food culture that is so evident today. This development went hand in glove with the thriving tourism industry.

In 2006, the extractive industries arrived in Gloucester en mass. New and expanded coal mining projects were being proposed at the same time as the brand new coal seam gas industry arrived. Gloucester's clean and green rural image was about to be industrialised.

Suddenly, increasing numbers of tree-changers found their dreams of rural life turning into mining nightmares, and this driver of rural growth and sustainable development foundered. Gloucester's tree-change phenomenon shrivelled and died.

Many of the tree-changers have said they would not have moved here had they known what was coming. Planned capital investments in grape growing, aquaculture, horse breeding and niche agriculture were abandoned.

A Sustainable Gloucester

With the reality of climate change upon us, we are facing significant changes to rainfall patterns that will result in large swathes of agricultural land becoming unproductive. We need to nurture and protect our rivers and productive agricultural and grazing land such as the Gloucester Stroud Valley.

In Gloucester, there is a viable economic alternative to laissez faire mining developments. We can take a strategic view and preserve and develop our sustainable options. We can grow our regional economy. We can do all of this without mining. If the present mining operations are expanded or developed as proposed it is likely that none of this will be possible.

Recommendation:

The socio-economic justification for the project should be re-presented to evaluate the impact of the project on tourism and the alternative economic model being developed by The Gloucester Project, for which significant state government funding has been received.

3 Mine Expansion Impact Issues

(e) Flora, Fauna and Environmental Offsets

Impacts on Flora and Fauna

Each successive extension and expansion of coal mining at Stratford since 1995 has resulted in a progressive fragmentation and whittling away of the native vegetation with accumulating impacts on the local native flora and fauna.

Under the current proposal, additional clearing and fragmentation of woodland and forest habitats in the project area would occur progressively over 11 years. The resulting impacts would further increase the isolation of the small remnant habitats in the project area and increase the risk of loss of local fauna species that utilise them. Those impacts would persist until vegetation becomes established in the offset areas, biodiversity enhancement area and on the post-mine landforms, a process that will not be complete until well into the next century.

Thirty three species listed under the TSC Act and six under the EPBC Act are considered by the proponent's consultants to be likely to be affected by loss of known or potential habitat due to this expansion.

Among the avian fauna that would be adversely affected by clearing for the proposed project is the Grey-crowned Babbler, which is in serious decline in the Gloucester valley. Other vulnerable bird species now rare in the Gloucester valley, include the Hooded Robin, Flame Robin, Scarlet Robin, Brown Tree-creeper, Little Lorikeet, Diamond Firetail, Speckled Warbler, Regent Honey Eater, Little Eagle and Varied Sitella. Potential or predicted habitat for all of these species would be lost to clearing under the proposed mine plan.

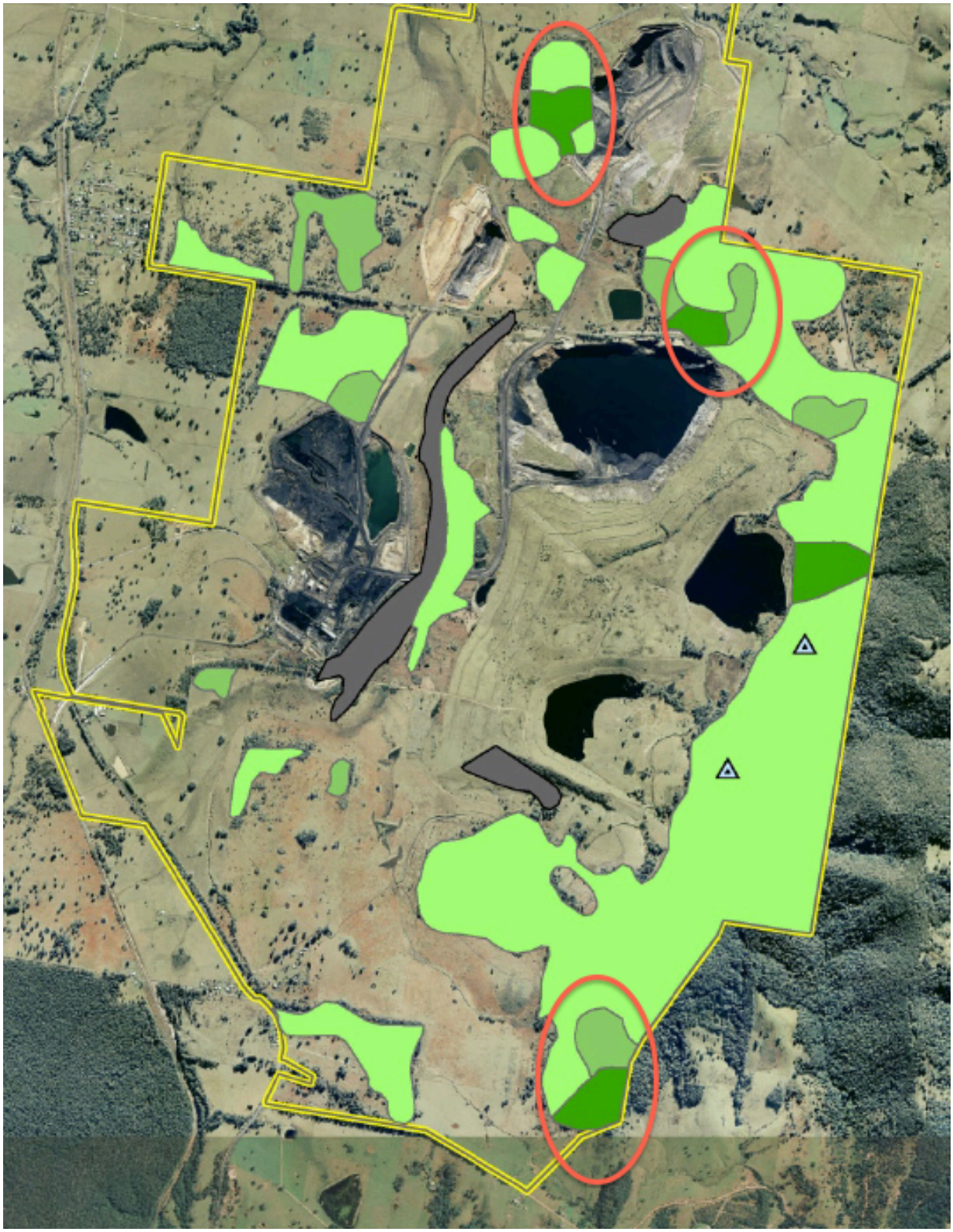
Threatened mammal species most likely to be significantly impacted are the Squirrel Glider and Brush-Tailed Phascogale, both of which are highly dependent on the availability of tree hollows for nesting. As the Squirrel Glider is currently persisting in only a few relatively small patches, survival of the local population is at risk.

Loss of tree hollows will be one of the most direct and significant impacts of clearing proposed to occur for the expansion of mining at the SCM.

In Eucalypt forests, the formation of tree hollows takes around a hundred years, and a further 50 years may be needed for development of large hollows needed by fauna such as the Squirrel Glider and Glossy Black Cockatoo. Until plantings on currently cleared offset areas mature, there would be a substantial net loss of habitat for such fauna, as they require mature trees for nesting & feeding. (Around half of the aggregate offset area is currently cleared.) Because of the long period of time required for their development, tree-hollows should be recognised as a limited resource that is not renewable within the time scale of a human lifetime.

Use of the AMBS survey rather than the more detailed Ecobiological survey to compare the density of tree hollows in the project area with densities in the offset areas is misleading. This is because the Ecobiological survey used a larger number of sampling points and consequently identified localised variations that are overlooked in the AMBS maps.

The work by Ecobiological (Appendix F Figure 9) found that in several parts of the woodland and forest within the project area densities range between 10 and 20 per hectare, and in four distinct areas the densities were found to exceed 20 per hectare. These are among the highest densities that occur in the project area and proposed offset areas.



Ecobiological 2011 Map of Tree Hollow Density in the Expanded Project Area.
Highest densities are circled. Source: Fig 9, p 50, EIS Appendix F.

It is of serious concern that one of the four remaining areas with the highest density of tree hollows in the project area may already have been lost due to cut back in the Bowens Road North open cut, and another two would be partially or completely cleared under the proposed mine plan for the new Avon North and Stratford East open cuts.

To reduce the risk of local species loss for fauna that utilise the tree hollows, clearance in the Stratford East and Avon North open cuts should not extend into those remaining areas of high tree hollow density. If this clearing was to proceed, the greatest impact would be on the Squirrel Glider and the proposed mitigations are likely to be less effective for that species than others because of its dependency on the limited supply of slow-forming tree hollows.

To replace lost hollows until offset re-growth matures, SCPL proposes to implement a nest box placement program. It is acknowledged in the EIS that the nest box installation program is unlikely to compensate for the direct loss of large hollow-bearing trees, but SCPL's consultants maintain that it is "likely to assist in the short to medium-term with the replacement of potential roost/nesting habitat for some species until existing regrowth vegetation becomes sufficiently mature to develop hollows." (Appendix F p 93).

However as most of that regrowth vegetation is only 50-60 years old or less, the development of hollows can be expected to take another 50 or more years. Hence habitat supplementation by installation of nest boxes would have to be maintained over that timeframe if a persistent net reduction in biodiversity is to be avoided.

The predicted duration of the East Stratford project is only about ten years and there can be no confidence that installed nest boxes will be maintained for at least another 50 years beyond that.

There is little information from Australian research to demonstrate the value to hollow-using species of installing artificial hollows to compensate for hollow-bearing trees lost through clearing. The AMBS fauna assessment presented in the EIS does however refer to research that has found utilisation of nest boxes by Squirrel Gliders to be only 20% - 50% after 3 years. Accordingly, AMBS recommends that a minimum of *two* nest boxes suitable for the Squirrel Glider be installed for each potential nesting hollow that is removed (the proponent has only proposed a ratio of 1:1).

The general lack of demonstrated effectiveness of nest box programs and the practical difficulties of maintaining the placed nest boxes over a period extending some 50 years or more beyond the project timeframe, highlights the inferiority of nest-box placement compared to the alternative of avoiding clearance of areas with high tree-hollow density and including more areas with at least moderate tree-hollow density in the areas to be offset.

Recommendations

More areas with at least moderate tree-hollow density should be included in the offset areas.

Where placement of nest boxes is required as a supplementary measure, this should occur in the more mature areas of forest and woodland in the offset areas prior to any clearance in the project area.

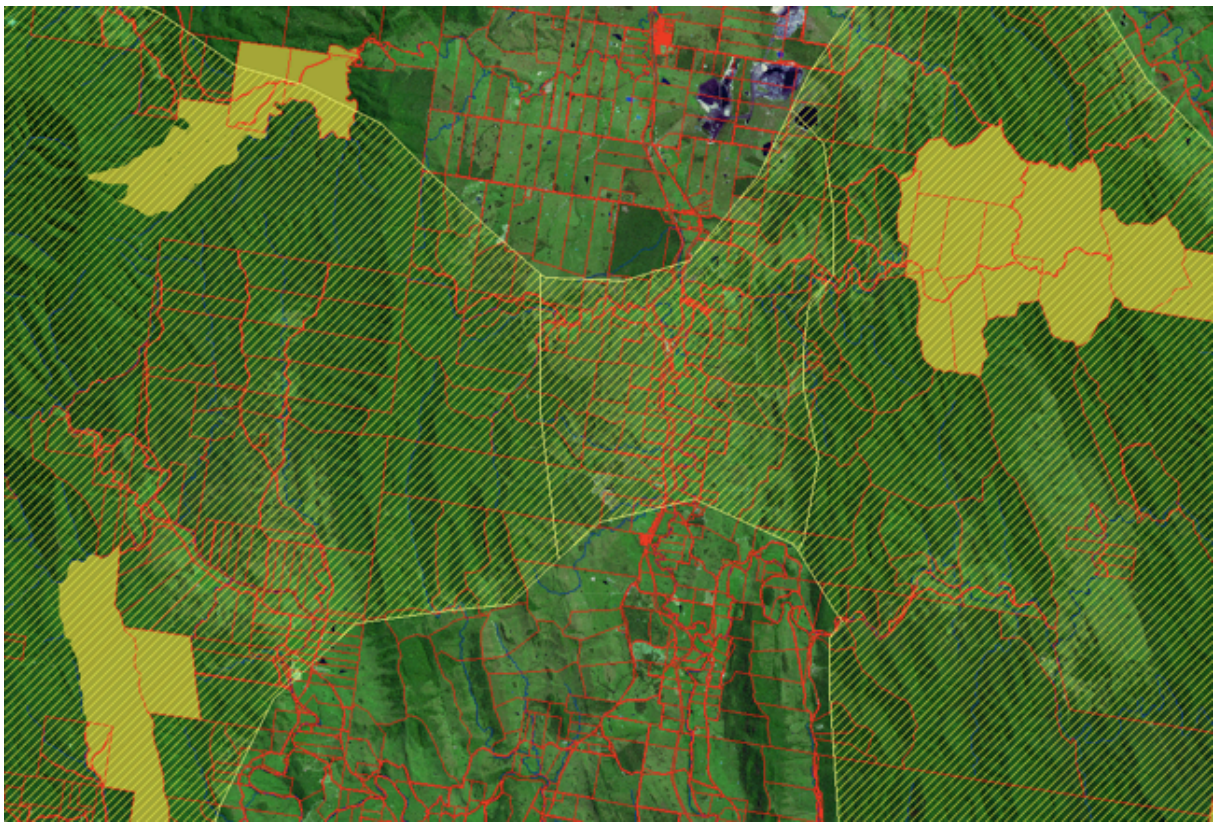
The number of nest boxes to be installed in the offset areas relative to potential nesting hollows removed should be at a ratio of at least 2:1

Proposed Environmental Offsets

The proponent's proposal to locate offsets close to the areas of lost habitat is supported because it will assist in replicating the original composition, increase the probability of colonisation and better incorporate localised habitat characteristics and ecological processes.

Similarly, the objective of restoring habitat and biodiversity across the Craven Valley Wildlife Corridor, primarily through the establishment of Offset Areas 3 and 4, is supported. (Note that the names "Craven Valley Wildlife Corridor" and "Barrington–Great Lakes Climate Change Corridor" refer to the same sub-regional corridor). Of the four offset areas proposed for the Stratford extension project, areas 3 and 4 are located within that corridor. Along with two existing VCA areas in or bordering the corridor, those offset areas would significantly enhance the condition and long-term viability of the wildlife corridor.

The location of the wildlife corridor is shown in the following figure. (As a guide to bearings, the SCM is visible at the northern edge of the Corridor, and Stratford Village shown as a red rectangle).



Craven Valley Wildlife Corridor. Source CANRI data set, Hunter Central Rivers CMA

Proposed Offset Area 1 is not located within the Craven Valley Wildlife Corridor and is not considered a suitable offset for a range of reasons. These include its small size, its location adjacent to Stratford village and its poor connectivity to other habitat areas, all of which diminish its likely viability and its potential to maintain or improve local biodiversity. The existing vegetation in Offset Area 1 consists largely of young regrowth grassy woodland and young regrowth dry sclerophyll forest, with a tree-hollow density of less than 6 per hectare.
Evidence from Australian research indicates that a large offset ratio is required to achieve no net loss of biodiversity. This is mainly because of the uncertain prospects of success for

aspects of the management plans designed to maintain and enhance biodiversity within the offset areas.

Although the proposed offset areas appear large in simple terms of combined area relative to the area to be cleared for the proposed expansion of mining operations, factors that reduce their overall adequacy include: the generally low densities of tree hollows; the presence of roads and houses within the areas; an existing electricity easement and a new easement to be created in the medium term, through Offset Area 3; and the expected development of at least 6 coal seam gas wells, also in Offset Area 3 during stage 1 of AGL's gas project.

Sections of the EIS that compare areas of vegetation to be cleared with areas to be offset, are deficient in that they focus almost exclusively on vegetation type and community (e.g. "dry sclerophyll forest", but provide no information on the age structure of the vegetation. For some of the threatened species utilising it, the age structure of the vegetation, and the related density of tree hollows, is as important as its type and composition.

Most of the area of native vegetation that would be cleared for additional surface development, some 97.7ha, is described as wet sclerophyll forest, dry sclerophyll forest and grassy woodland. The proposed offset areas do include larger areas of these forest types. However they mostly have a much lower density of hollow-bearing trees than occurs in some parts of the areas that it is proposed be cleared. Offset Areas 1 and 2 for instance are described in the EIS as containing fewer than 3 hollow bearing trees per 0.5ha.

Potential exists to improve the connectivity between the offset areas. Offset Areas 2 & 3 are connected by a large VCA on Property Number 44 west of Craven village. Offset Area 4 adjoins extensive areas of largely undisturbed vegetation but is not connected to Offset Areas 2 & 3 by land over which there is any certainty of maintenance of high biodiversity. However a property (ex Allman, Property Number 61) that practically connects Offset Areas 3 and 4, is owned by the proponent and contains forest of similar age structure to that which it is proposed be cleared in the project area. Extension of Offset Area 3 to include part or all of that property would achieve near-contiguity of Offset Areas 2, 3 and 4.

Apart from the low density of tree hollows, perhaps the greatest threat to the maintenance and enhancement of biodiversity in the offset areas is the location within them of some eight or nine residences. The EIS does not address the question of how the implications of the presence of these residences would be handled.

If the residences were to be left in place and occupied, they would need to be excluded from the area that would be subject to a conservation covenant and measures to control this potential impact on the offset areas would need to be implemented and monitored. Issues to be addressed would include the potential for impact of domestic dogs and cats on native fauna and activities of occupants that may affect disturbance-sensitive species in the surrounding offset area.

Recommendations

The proposed Offset Area 1 should be rejected as it is not appropriately located and is unlikely to be of enduring viability. An alternative area within the Craven Valley Wildlife Corridor with better linkages to other offset areas, and with a higher tree-hollow density, should be identified from the survey data prepared for the EIS. The ex-Allman property should be considered for this purpose.

The proponent should be required to nominate additional areas that would be used as supplementary offsets in the event that monitoring finds that habitat restoration in initial offset areas has not achieved long-term viability and functionality of biodiversity.

A higher offset ratio should be required. This is necessary to compensate for the generally low densities of hollow bearing trees in the offset areas, the long time lag that will occur in the establishment of replacement habitat; uncertain utilisation rate of artificial nest boxes; uncertainty of success of development of offset habitat; and the impacts on the proposed offset areas of houses, power transmission easements and planned coal seam gas infrastructure.

The Avon North open cut should not extend into the forest/woodland area identified in the Ecobiological surveys as having more than 20 tree-hollows per hectare.

The Stratford East open cut should not extend into the forest/woodland area identified in the Ecobiological surveys as having more than 20 tree-hollows per hectare.

Night time mining should not be approved in the Stratford East and Avon North open cuts because of the impact on nocturnal threatened species utilising the native vegetation remnants within and adjacent to the expanded project area.

The number of nest boxes to be placed in offset areas to compensate for losses due to clearing or isolation of habitat should be supplemented by additional boxes to provide habitat for fauna likely to be displaced from areas adjoining the expanded mining area due to disturbance from noise, lighting and blasting for the duration of the project.

The draft Biodiversity Management Plan and reports on the biodiversity monitoring program should be provided to the CCC for comment before being submitted to the regulatory department, and the CCC's comments provided to the regulatory department.

3 Mine Expansion Impact Issues

(f) Socio-Economic Justification

Social issues associated with the proposed extension of the Stratford coal mine are very significant for the community. These include the factors of noise, blasting and air quality that affect human health as well as land purchases, pollution, operating hours and environmental preservation that affect community amenity. Unfortunately the economic value placed on these in the EIS is reflected in the fact that while noise, operating hours, blasting and air quality are discussed in the Executive Summary, their full impacts on the community are not addressed. This is discussed in other sections of this submission. The issues of human health, welfare and amenity are not discussed at all in the Executive Summary and this indicates a very low level of concern by the proponent. Likewise the perceived economic benefits of employment, net benefits of coal sales, and royalties to the NSW Government are summarised in the Executive Summary but there is no mention of the health, social or environmental costs. So the economic analysis is biased.

BGSPA commissioned Economists at Large to assess the economic justification for the project as presented in the EIS. A member of the community, Dr Gerald McCalden, also contributed an assessment. This section is a summary of these assessments, referred to herein as 'Campbell (2013)' and 'McCalden (2013)' respectively, and which have been included as appendices (iii) and (iv) to the submission.

Both of these studies conclude that the social and economic assessment sections of the Stratford Extension Project EIS are not suitable for decision making in their current form because they fail to clearly demonstrate the economic costs and benefits of the project to Australia, much less to NSW and the local community.

Noise, Blasting and Air Quality

This submission raises the many concerns in the community about noise, blasting and air quality in the areas around the mine. It is unacceptable that in the EIS these impacts are assigned zero values beyond the cost of mitigation measures (land purchases) that are incorporated into the capital costs of the project. (Appendix P section 2.4.2). The EIS assumes that there are no costs to the community or to individuals for the impact of noise or air quality problems beyond the mine boundary or the land purchased by the company.

The EIS also considers that there is no need to value impacts on the community outside the affected zone, provided they remain within legislated guidelines. Campbell (2013) says "this is inappropriate as compliance with guidelines does not mean community welfare is unaffected in these areas. Local people who are affected by these impacts, but are not compensated for these (impacts), incur economic costs of this project."

Agriculture and Visual Impacts

No costs are ascribed to impacts on agricultural land removed from agriculture or to the loss of visual amenity for the community or the tourist industry. Section 2.4.2 of Appendix P states "the present value of foregone agricultural production is reflected in land prices" and "has therefore been incorporated in the BCA through inclusion of the full land value (opportunity costs) of affected properties." McCalden (2013) says that this "internalisation of a cost, whereby a resource extractor buys a community asset, and then effectively writes it off" so that it has no external impact, does not capture all of the values lost in the closure of a family farm. Nor does it reflect the cost to surrounding agricultural enterprises and agricultural service industries.

Table 2.3 of Appendix P indicates that visual costs are reflected in land values and therefore included in capital costs. This implies that the impacts of waste rock emplacements, open

cuts, clearance of vegetation, buildings and night lighting, all of which will be visible to the community, will be negated by property purchases. This is not the case and a true value needs to be placed on these negative impacts.

Flora and Fauna

In the case of flora and fauna it is assumed that the impact cost will again be offset by land purchases. This fails to consider the efficacy of the biodiversity offsets being proposed or the long-term costs to someone of managing the land that is to be "secured in perpetuity".

"Impacts on flora and fauna are assumed to be offset by an ecological offset programme and no value assigned to any damage that may be caused. This is inappropriate as it ignores the considerable debate between ecologists over the ability of offset programmes to achieve their aims in many cases. We suggest it is beyond the expertise of Gillespie Economics to adjudicate in these debates between physical scientists. The allocation of zero values to these external costs is just such a judgement. (Campbell 2013)

Human Health

The EIS cost benefit analysis makes no mention of the impacts on human health of open-cut coal mining and transportation, despite current concern in the community and by health care professionals. McCalden (2013) says "it should have been well within Gillespie's competence to have undertaken a review of the available literature, and to derive some cost values."

Campbell (2013) says that "such appraisal would be assisted by a recent NSW Department of Health report looking at morbidity and mortality in regions of the Hunter Valley affected by mining (NSW Health 2010a). They found that the regions in the Hunter most affected by mining have higher rates of emergency department attendances for asthma and other respiratory conditions; hospital admissions for respiratory conditions and cardiovascular disease and mortality due to cardiovascular disease and all (of which) cause mortality. Analysis of presentations to GPs also suggested higher rates of asthma and other respiratory conditions in communities affected by mining, although not statistically significant (NSW Health 2010b)."

With long-term, empirical evidence linking significant health impacts to coal mining, it is important that the costs associated with impacts are included in consideration of this project. Clearly these are costs that accrue to the local and NSW community and should be included in the assessment.

Employment and Workforce Anomalies

The proposed new project will require a doubling of the workforce with "up to 250 on-site personnel" (p ES-1). However, on page ES-6 these are described as 250 direct and indirect jobs in the Newcastle region. Only one of these statements can be correct.

Unfortunately this number of 250 people employed is used in later economic analyses leading to incorrect assertions for local and regional benefits that state the project will deliver "an average annual stimulus of some 714 direct and indirect jobs in NSW" (p ES-1).

If approved, 21.5Mt of coal will be mined in 11 years at an annual ROM production of up to 2.6Mt (p 2-13). This is less than the current approved operations of 3.1Mtpa of ROM (p 2-1) at the Stratford Mining Complex using a workforce of 125 people (p ES-1). Clearly the new project will be only half as efficient in recovering coal as the existing project.

It is proposed that these employees will support the mine operating 24 hours per day 7 days per week (p ES-5) which is not the case for the current approval with a higher ROM tonnage. Clearly again the new proposal is less efficient than the existing mine but this is not discussed in the EIS. It is surprising that a benefit cost analysis has not been undertaken to demonstrate the need for, and efficiency of, 24 hour mine operations compared with the current approval. 24 hour mining is totally unacceptable to the community and has not been justified in the EIS. "The claim that project viability is dependent on a change that has major implications for the amenity of the local area further suggests that the value of the project in the EIS has been overstated and that NPV is likely to be at or below the lowest estimates of the sensitivity analysis, possibly negative." (Campbell 2013)

The EIS states "the impact of skills shortages in the region is likely to be negligible". Again this is a concept that was not discussed with the local business sector that is suffering through a loss of qualified staff to the mine. One reason for this is that the mine does not train any apprentices but recruits them from other industries after they are trained. This is a cost to the community.

On the other hand the benefit cost analysis includes a beneficial value for the "non-market value of employment" (Appendix P page 13). Even the EIS says that the inclusion of this value may be contentious in the context of a fully employed economy - which is the case in Gloucester with unemployment at 4.9%. Campbell (2013) "call(s) on Gillespie Economics to desist from including this discredited value in their work". Studies have been undertaken in other locations to quantify the non-market value of the environment or the community amenity but these have not been considered in this EIS.

McCalden (2013) suggests that the EIS authors should have also used the Choice Modelling approach to estimate society's willingness to pay to preserve the health, well-being, amenity, scenic values and tourist industry in the Gloucester Stroud Valley. They did not because it did not suit the benefit cost analysis that they were seeking.

Final Voids

The final landscape does not have to contain polluted and unsafe voids that are unacceptable to the community. In the proposed Rocky Hill mine, next door to Stratford, the landscape plan is to fill all voids. In the Stratford landscape plan, the voids will continue to fill with water and become increasingly polluted with salt over 200-500 years. The cost to the environment and the community has not been considered at all. "The EIS should have used "cost benefit analysis to evaluate the different options and their impacts on viability and local amenity" because "claims (Section 6, p 6-15) that minimising the final voids associated with the project was unviable further suggests the project's value and viability has been overstated." (Campbell 2013)

Cost Benefit Analysis

Use of cost benefit analysis (CBA) has been criticised by McCalden (2013) because it "was originally developed as a tool for choosing between alternative means of achieving a particular goal in the public investment arena, or in choosing between one alternative as opposed to another, where each might deliver a specific public benefit. Within this framework, only issues of public (societal) costs and benefits were considered, and the reality of limited resources was implicit. To hijack the CBA approach in an attempt to provide social justification for a private investment proposal involves a massive abuse of economic theory and practice, and acceptance of a principle that what is good for the proponent is also good for society at large."

The problems in developing values for costs and benefits using capital land purchase costs is discussed above in this submission and further illustrates the problem with BCA in the context of a private coal mine.

The benefits attributed to the value of coal sold are contentious because they do not reflect current prices and downward trends in world market prices. The sensitivity analysis presented in Appendix P section 2.6 and Attachment 3 indicates that the project benefits are highly sensitive to a 20% reduction in the value of coal and coal prices have fallen more than 20% since the analysis was undertaken. This unprofitability is perhaps reflected in the fact that mining operations at Stratford were suspended for three weeks.

"Decision makers should note that the EIS makes no mention of coal specifications, or of the relative quantities of thermal and metallurgical coal the proponents hope to produce. This precludes any serious independent assessment of the values presented in the EIS." (Campbell 2013)

In the EIS the project is estimated to have net benefits of $215m, with $146m accruing to Australia but Campbell (2013) says "these estimates are almost certainly optimistic. How the adjustment from global benefits to Australian benefits has been made is unclear from the socio-economic assessment. We believe it is unacceptable for one of the most important calculations in the cost benefit analysis to be presented with no discussion of methodology, working or sources."

Input - Output Model

Both economic studies have serious questions about using the Input–Output (I-O) modelling approach for economic analysis of this project. The potential regional benefits calculated using this approach are questioned because of the base data used. McCalden (2013) questions the use of the Gloucester and Great Lakes Shires combined as a region for analysis; there is nothing logical or natural about selecting such an artificial region and it distorts the analysis.

I-O modelling is becoming unacceptable in economic studies due to its lack of supply side constraints and use of fixed input prices (Campbell 2013). Even if I-O modelling was appropriate, then the data used needs to be accurate and this is not the case. Section 3.3 of Appendix P makes two incorrect assumptions in the analysis of Project operation; firstly in paragraph 2 that there will be 250 people directly employed; and secondly in paragraph 1 that production will increase above historical levels but both of these matters are contradicted in other sections of the EIS. The EIS fails to provide sufficient background information to enable independent checking of the outcomes claims from I-O modelling at either the regional or state levels.

As quoted in the study by Campbell (2013) "I–O models lack resource constraints and fail to capture significant welfare (consumer and environmental) impacts. They always produce a positive gain to the economy, however disastrous the event." "The use of input-output modelling in section 3 of the socio-economic assessment creates a misleading impression of the impacts of the project: '*the Project is likely to result in an average annual stimulus of up to approximately 250 direct and indirect jobs in the Newcastle region and some 714 direct and indirect jobs in New South Wales at peak production.'* These are certainly overestimates."

Greenhouse Impacts

Campbell (2013) argues that the EIS "omit(s) the main impact on greenhouse gas emissions from their assessment, which is the marginal increase in the amount of coal burned in the world" if this project did not proceed.

Director General's Requirements

McCalden (2013) points out that the EIS does not really address the requirement for the analysis of feasible alternatives as it is only the proposed project that has any serious level of economic analysis. The EIS states on page 5 of Appendix P:

> *"The Project assessed in the EIS and evaluated in the BCA is considered by SCPL to be a feasible alternative that minimises environmental and social impacts whilst maximising resource recovery and operational efficiency."*

However, McCalden (2013) considers that "the 'alternatives' presented in Section 6.9.2 are no more than minor variations in site management and scheduling. Thus, Gillespie have completely ignored the explicit requirement that they consider, inter alia, '*the consequences of not carrying out the development',* asserting instead that '*alternatives need to be feasible to the proponent'.* As usual, no justification is provided for this assertion, the proponent's commercial interests apparently over-riding, to the point of complete obliteration, any community concerns and preferences." This position by the proponent is contrary to that of NSW Treasury that:

> *"CBA estimates and compares the total benefits and costs of a project or policy to the members of a specified community. In order to do this, a CBA lists all the groups in the community affected by a policy or project and values the effects on their welfare in monetary terms as the effects would be valued by the parties themselves".*

Campbell (2013) is critical that "the cost benefit analysis in the socio-economic assessment is carried out at a national level, while the Director General's Requirements for the assessment are to ascertain if the project results 'in a net benefit to the NSW community'. The national scope will inevitably overstate the value of the project to the NSW community and NSW decision makers need to be aware of this overstatement. A revised cost benefit analysis for NSW should be produced, in line with the Director General's requirements."

The Director General's Requirements for environmental assessment state as the first point that the "EIS must include a detailed description of the development including [among other things] justification of the proposed mine plan, including efficiency of the resource recovery…" The EIS for this project does not do this.

The apparent discrepancy between current production/workforce and proposed project production/workforce has already been discussed (see Employment and Workforce Anomalies). The proposed doubling of the workforce is stated to be necessary to support the mine operating 24 hours per day 7 days per week despite a significantly lower rate of production. Clearly again the new proposal is less efficient that the existing mine but this is not discussed in the EIS. Campbell (2013) suggests that it is surprising that a benefit cost analysis has not been undertaken to demonstrate the need for, and efficiency of, 24 hour mine operations compared with the current approval.

Table 2-2 (p 2-26) indicates that 157.9Mbcm (bank cubic metres) of waste rock (overburden) will be moved to recover the 28.6Mt of ROM which will in turn yield 21.5 Mt of product coal. The relative efficiency of this operation that moves 7.33 bank cubic metres to gain 1T of coal is not discussed either in terms of engineering or economic efficiency. A recent analysis by Citi Research (July 2102) indicates that the cost of production for Yancoal in the Gloucester Basin is about $93 per tonne whereas its Moolarben mine (near Mudgee) operates at about $40-45 per tonne. One reason for this would be that the overburden strip ratio at Moolarben is only half that at Stratford (Yancoal website). Over all operations, Yancoal operates at an average production cost of about $80/t which places them in the upper end of the 2nd quartile

of cost for production in Australia (Citi Research, July 2012). The low efficiency of the Gloucester operation is not discussed in the EIS even though it is a DGR.

Conclusion

Based on the two economic assessments undertaken, this submission contends that the social and economic aspects of the EIS are inadequate and require considerable additional work.

The economic study by Campbell (2013) concludes that:

> "The socio-economic assessment of the Stratford Project is not suitable for decision making in its current form. It fails to clearly demonstrate the economic benefits of the project to Australia, much less NSW and the local community. Justification of assumptions, especially relating to commodity prices and local distribution of benefits is crucial if the public is to have any faith in this assessment. At a global scale the vast damage from downstream emissions suggest the project is economically unjustifiable, while at a local level problems such as:
>
> - failure to justify changes to mine operation hours;
> - no evaluation of final void options;
> - no quantification of most external costs and risks; and
> - no consideration of health impacts;
>
> also bring the efficiency of the project into doubt.
>
> "Methodological flaws such as inclusion or reference to social benefits of employment and misleading use of input-output modelling need to be revised before the assessment can inform decision making around this project."

The local economic study by McCalden (2013) concludes that the EIS:

- "presents overall a biased chain of argument which is focussed solely on the Proponent's commercial interests;
- trivialises, dismisses, and in some cases completely ignores, the host of negative impacts which the proposal would have on the local community;
- ignores geographic, social, and economic reality by presenting a bizarre amalgam of Gloucester Shire and Great Lakes Shire as a plausible local region, and building a case on this foundation;
- fails to provide sufficient background information to enable independent checking of the outcomes claimed from I-O Modelling at both the local and NSW State level;
- provides conflicting details of direct employment, and grossly exaggerated claims about indirect job creation at the local and State levels;
- completely ignores the probable interim and long term personal and public health costs, despite the availability of extensive overseas relevant research; and
- assumes an unrealistically high future coal price and fails to emphasise the conclusions which could be derived from sensitivity testing of this assumption."

This submission suggests that for these reasons (and the detailed explanations provided in the full papers), it is not possible for the community to have any confidence in the social or economic analysis undertaken and published in this EIS. Therefore, a realistic cost and benefit analysis has not been undertaken and decisions on the extension of the mine cannot be made until these analyses are revised.

Recommendation:

That the EIS be re-presented because the socio-economic assessment provided has failed to clearly demonstrate the economic benefit of the project for NSW and the local community as specified in the DGR.

3 Mine Expansion Impact Issues

(g) Lighting

The EIS fails to meet the Director General's Requirement that a *detailed assessment* be provided of the potential lighting impacts of the project on private landowners in the surrounding area as well as key vantage points in the public domain and a *detailed description* of the measures that would be taken to minimise the impacts.

The assessment of potential lighting impacts is very limited and insufficient for potentially affected landowners to judge the likely impact on their properties. Similarly, the descriptions of the proposed mitigation measures are not adequate to provide confidence in their likely effectiveness.

Currently, the main sources of light affecting residents in proximity to the SCM complex are the CHPP, product stockpiles and train loading facilities. However it is clear from the general project description that should 24-hour mining operations be approved, the intensity of the glow produced by night lighting would increase and there would also be an increase in night lighting from mobile equipment including vehicle-mounted lights.

Night operations on the East Stratford waste rock emplacement for instance would require positioning of light sources on the emplacement at much greater height than any existing light source at the SCM. This will lead to a significant change in both area and number of residences, affected by night-glow and direct visibility.

The proponent maintains that night time lighting would be limited to that needed for operational requirements and safety and that light emissions from the project would be minimised by select placement, configuration and direction of lighting so as to reduce off-site nuisance effects ***where practicable***.

This is not adequate. As with other emissions from the operation such as noise, the impacts of lighting must be limited by criteria linked to the location of so-called "private receivers".

In addition to the impact on residents, lighting for night operations on the East Stratford waste rock emplacement and for mining in the Avon North and Stratford East open cut pits would also impact movement and foraging by nocturnal fauna in the adjoining habitats, including those proposed to form part of Offset Area 3.

Recommendations

To determine the affected receivers, the proponent be required to provide mapping of the area that would be impacted by light from night operations and provide predictions of the increase in night time light (direct and indirect) that would be experienced across that area.

To minimise the effect of direct and indirect light nuisance on properties in proximity to the project area and adverse impacts on nocturnal fauna in adjacent habitats, the conditions of consent should preclude night time mining operations.

Gloucester Shire Council to be assigned authority for monitoring the adequacy of measures taken to reduce light pollution from the SCM complex to the minimum that is reasonably achievable.

3 Mine Expansion Impact Issues

(h) Non-Aboriginal Heritage and Visual Assessment

BGSPA considers that both the Non-Aboriginal Heritage and Visual assessments fail to give due regard to the Gloucester Valley's heritage landscape significance. Further, neither assessment properly addresses the Director General's Requirements. Had they done so, due recognition of that significance would have followed.

Gloucester Council's submission provides an extensive account of the relevant issues. BGSPA is content to raise broad issues in principle only and to rely on Council's submission to provide the necessary detail.

Failure to Address the Director General's Requirements

Non-Aboriginal Heritage

The DGR stipulate that an assessment of the project's impact on items of State or local heritage significance be undertaken, including an evaluation of the mitigation and management measures to be implemented. The requirements specify that *all* items of State or local heritage significance should be assessed, it does not limit the requirement to items on the State Heritage Register or the State Heritage Inventory.

The Non-Aboriginal Heritage Assessment (Appendix J) acknowledges this throughout by assessing items in and near the project area that are not necessarily statutorily listed but, for reasons not specified, fails to identify the scenic heritage significance of the Stroud-Gloucester Valley. It follows that it fails to both assess the project's impact on that scenic heritage significance and to identify and evaluate necessary mitigation and management issues.

Visual Assessment

The DGR requires that the assessment include '*potential visual impacts of the project on private landowners in the surrounding area as well as key vantage points in the public domain…*', yet the assessment provided in the EIS fails to do so by using a limited selection of viewing points from private properties and completely avoiding assessment from key vantage points in the public domain.

Social and Economic Value of the Valley's Heritage Landscape

The Stroud-Gloucester Valley's heritage landscape underpins the valley's way-of-life, its agriculture and its tourism industry. An understanding of the valley's heritage significance, including its scenic qualities, is of the highest importance in gaining an understanding of its social/economic base.

The Gloucester Valley and Gloucester township serve as a tourism destination centre in their own right and as a base for areas further afield, including the World Heritage Listed Barrington Tops. Tourism currently contributes thirty million dollars annually to the local economy based on overnight stays (figures per Destinations NSW, formerly Tourism NSW) but does not take into account day visitors and overseas visitors, so the total value would be in excess of this amount.

The danger that arises from the inadequate assessment of the Stratford Extension Project is that these qualities will continue to be eroded by that Project and by further developments assessed to the same inadequate standard. The result will be that the valley's special significance will be permanently lost and its local economy and lifestyle irreparably damaged. The damage that can be inflicted on the local economy will far exceed any benefits from mining expansion.

The Valley's Heritage Landscape Significane is Widely Recognised

Claims made in the Non-Aboriginal Assessment that the valley's landscape significance has not been recognised or acknowledged by Gloucester Shire Council and Great Lakes Council are incorrect. Gloucester Shire Council recognised the valley's significance in the commemorative publication *The Vale of Gloucester*, 1953. The Vale of Gloucester was among the first cultural landscapes to be formally identified in Australia when it was listed by the National Trust of Australia (NSW) in 1975 and nominated for entry on the Register of the National Estate in 1976. This nomination was supported by Gloucester Shire Council but, for unknown reasons, the Australian Heritage Commission failed to assess the nomination and it remained as an Indicative Listing until the Register was discontinued in favour of the National Heritage List on 1 January 2004.

The Gloucester Local Environmental Plan addresses natural and scenic conservation by way of the Environmental Protection (Scenic), Scientific and Wildlife Habitat Zones. Relevant among these is the Zone 7(d) Environment Protection (Scenic) that surrounds the Gloucester township and corresponds approximately to the area known as The Vale of Gloucester.

Great Lakes Council has similarly recognised the valley's significance in a number of planning documents, particularly but not limited to those relevant to Stroud in the valley's south. The lack of entry onto the Great Lakes Local Environmental Plans is partly due to the general lack of experience and expertise in assessing landscape areas but mainly because the valley is divided approximately equally between the two local government bodies.

The documents that address the valley's landscape heritage significance are:

- the Gloucester Shire Council's commemorative publication *The Vale of Gloucester*, Eve Keane, Gloucester Shire Council, 1953;
- the National Trust of Australia (NSW) listing 1975;
- the nomination to the Register of the National Estate 1976;
- the National Trust of Australia (NSW) revised listing 1981;
- provision of the Environment Protection (Scenic) Zone in the Gloucester LEP 2000,
- *The Stroud-Gloucester Valley: A Heritage Landscape Under Threat*, BGSP Alliance Inc., 2009;
- the National Trust of Australia revised listing 2009;
- nomination to the National Heritage List 2010, 2012.

Failure to Acknowledge the Valley's Heritage Landscape Significance

The Non-Aboriginal Heritage Assessment draws erroneous conclusions about the landscape's significance, denies the extent to which that significance has been recognised and downgrades or dismisses documents that address the landscape's significance.

The Visual Assessment similarly fails to address the landscape's significance, draws incorrect conclusions about the impacts of the project and relies on inadequate past assessments as a substitute for undertaking a current assessment. These past assessments were inadequate when undertaken but to now rely on them as a means to address cumulative impact for the Stratford extension project is a wholly deficient process. Further comment regarding cumulative impact is made below.

Failure of the Non-Aboriginal Heritage Assessment

The proponent's Non-Aboriginal Heritage Assessment as described in Appendix J covers 37 pages plus a bibliography, plus a further eight pages in Attachment 1 – a total of 47 pages which purports to provide a detailed assessment of heritage matters that are relevant to the project area.

However, a review of the assessment reveals that the critical parts of the report that address cumulative impact, mitigation measures and conclusions cover only three pages in total. The purpose of this, it appears, is to minimise or avoid assessing the true impact of the project on the valley's heritage landscape. In consideration of this, the Assessment is perceived as being deficient in its scope, analysis and conclusions.

Failure of the Visual Assessment (Appendix O)

BGSPA's main concern is that, like the Non-Aboriginal Assessment, the Visual Assessment appears determined from the outset to disregard the valley's and the site's landscape heritage significance. The Visual Assessment relies in part on past visual assessments undertaken in and near the project area as part of the environmental assessments for other existing and proposed projects in the area but those assessments were considered as inadequate when undertaken.

The Visual Assessment also comprises 47 pages plus tables and figures. A reasonably comprehensive assessment has been provided in considering views from selected properties but assessment of the visual impact on the area's landscape has not been made. As previously noted, the DGR for the Visual Assessment stipulate that the assessment include '*potential visual impacts of the project on private landowners in the surrounding area as well as key vantage points in the public domain…*'. The Visual Assessment fails to do so by using a limited selection of viewing points from private properties and completely avoiding assessment from key vantage points in the public domain.

Visual Assessment - Higher Viewing Points Not Considered

The assessment concludes (Appendix O p 7) by claiming that the views of the Stratford Mining Complex are limited due to the topography and the presence of scattered vegetation that partially or wholly screens potential views. This needs to be quantified and expanded because there are a number of higher viewing points from which the site is very obvious - these should have been assessed but appear to have been avoided. More disturbingly, it indicates that the excessive use of tree plantings will be seen as the 'quick-fix' for the visual impact, rather than undertaking a proper visual assessment as part of the project's environmental assessment.

Tree Tunnels Not An Appropriate Mitigation Technique

The issue that is materialising in the Gloucester Valley, as it is a feature of all the extractive industry projects both in operation and under application, is the reliance that is being placed on the mass planting of rows of trees along roadways to shield views of the mining operations and infrastructure from access routes and individual properties.

The valley's landscape significance depends on substantially open views; the landscape requires proper assessment with due weight given to important views and viewing corridors before screening plantings can be considered as a suitable mitigating procedure. When tree plantings are used they should be of suitable placement and design, rather than relying on the all obscuring walls of trees along roadsides.

It will be a tragedy for the Gloucester Valley's scenic significance if it is to be viewed through the tunnels and walls of trees that now despoil parts of the Hunter Valley.

Other Mitigation Measures Not Considered

Both the Non-Aboriginal Heritage Assessment and the Visual Assessment do not consider any other means of impact mitigation. For example, mullock heaps and coal stockpiles are already a major visual impact on the landscape and are set to worsen. It is critical that environmental assessments develop more suitable means of treating mullock heaps and coal stockpiles and of mitigating their impacts.

Failure To Assess Cumulative Impact

Both of the environmental assessments fail to assess the cumulative impact of the proposed Stratford extension on the landscape's heritage-visual significance despite claiming to have undertaken that assessment. The projects that should have been considered in assessment of the cumulative impact include the existing Gloucester Coal and Duralie Coal projects, the approved AGL coal seam gas project and the GRL coal mining proposal. The Non-Aboriginal Heritage Assessment provides only seven lines in its dismissal of cumulative impact and the Visual Assessment provides no consideration of cumulative impact at all. This is a critical deficiency that goes to the project's impact on the economy, social structure and lifestyle of the Gloucester area. The valley's capacity to absorb the ever-increasing impact of the expanding coal and gas projects is now at saturation point, so that full and proper assessment of this impact is critical.

The Stroud-Gloucester Valley should be assessed as an integral, entire landscape. It should not be viewed only as a number of discrete areas within the larger landscape. Development that takes place in any part of the landscape ultimately impacts on the whole of the landscape from a scenic and heritage consideration. Without a 'whole of landscape' approach, the component vistas, buildings and historical sites that make up the whole, even if they are protected individually, will become detached items in a disjointed landscape. The significance of the landscape will therefore be permanently lost.

Recommendations:

The Non-Aboriginal Heritage Assessment of the landscape should be commenced by undertaking a full and proper review of all relevant documents and attaching due weight to them, rather than taking the selective and dismissive approach evidenced in the Environmental Assessments.

A full and proper assessment of the visual impact on the landscape should be made from a representative pattern of locations in the immediate area and the broader area, but placing emphasis on those sites that offer wider views over the land, particularly where those views are representative of the valley's heritage landscape significance. This critical assessment should take note of best overseas practices being used in Europe and the USA in particular, where features such as viewing angles, elevations, distance diminution, visual mass of the impacting development and a much expanded range of mitigation techniques are taken into consideration.

Extensive strip plantings of trees along the Bucketts Way and other access road will have a significant impact on the valley's heritage landscape qualities and must not be allowed to become the standard approach to mitigating visual impact. The Environmental Assessments must identify techniques that allow the landscape vistas to be retained. This may involve placing selective screen plantings closer to the sites that need to be screened and designing plantings so that distance views and vistas are retained by way of viewing corridors and open unplanted sections. As a guide, plantings should be site specific and at some distance from access routes so that the all-obscuring wall-of-trees effect does not result.

Full consideration must be given to all aspects of the size and placement of waste rock emplacements and coal stockpiles, including the levelling and back-filling of voids to minimise their visual impact. Under the proposed mine plan, which includes concurrent rather than sequential development of three open cut pits, there will be three large voids and a high waste rock emplacement remaining at the end of the project. Landscape changes caused by these items are very intrusive and their size and placement should be reduced through changes to the mine plan that would include backfilling of the voids.

4 Post-Consent Management And Monitoring

Community Consultative Committee Input

Post-consent management and monitoring will be guided by a number of plans including a Noise Management Plan, Blast and Vibration Management Plan, Biodiversity Management Plan, and a Rehabilitation Management Plan - all of which are yet to be prepared.

These plans, and the monitoring reports produced in relation to them, would form the basis of compliance management for the expanded mining operations at the SCM.

As the Plans must reflect the conditions of consent that would be attached to the project approval, they cannot be finalised until after the application has been assessed, with the effect that there is no opportunity for comment on their adequacy during the public consultation phase of the project assessment.

This could be remedied to some extent through greater use of the potential for community comment and feedback that exists in the Stratford Coal Community Consultative Committee (CCC).

The conditions of consent for the current BRNOC operation provide that the CCC "may make comments and recommendations about the preparation and implementation of environmental management plans, monitor compliance with conditions of this consent and other matters relevant to the operation of the mine during the term of the consent."

The conditions also require the company to consider the recommendations and comments of the Committee and provide a response to the Committee and Director-General.

In practice however, the CCC's capacity to provide input to the planning/assessment/approval process regarding modifications to existing approvals or applications for new developments has been very limited due to the scant information regarding CCC views that is included in documents prepared and submitted to the Department for project approval, such as the current EIS. This is illustrated by the omission from the EIS of any mention of the unanimous opposition of the CCC to 24-hour mining operations.

To address this, the conditions of consent for the expanded operations should expressly require that draft management plans be provided to the CCC for comment prior to their being submitted for approval, and also expressly require that the CCC's comments be provided to the Department at the time the plans are submitted for approval.

To strengthen the capacity of the CCC's to contribute to that process, an annual contribution should be made by the proponent to Gloucester Shire Council to establish a fund that could be drawn on to obtain expert advice that would assist community and council members of the CCC to more effectively fulfill their role on the Committee.

A similar arrangement exists in relation to the Bowens Road North open cut, although to be effective the annual contribution to the fund would need to be raised from $2,000 to at least $5,000 pa, and the fund should be cumulative.

Complaints Management Process

There is widespread dissatisfaction with the complaints management process, as discussed elsewhere in this submission. The dissatisfaction stems not from lack of prompt initial response to complaints, but rather from the lack of an eventual outcome that identifies and addresses the subject of the complaint.

Beyond a basic tallying of the number of complaints about noise, dust, blasting etc., and the total number of complainants, the complaints are not systematically analysed to establish patterns in terms of factors such as location and time of day that could identify impacts not predicted by modelling or captured by existing monitoring.

Even a cursory review of the record of complaints relating to the existing SCM operations raises questions about the accuracy of modelled impacts, the appropriateness of regulatory criteria included in conditions of consent and the effectiveness of remedial or mitigation measures.

This inadequacy in the complaints management process is reflected not only in the current application, but in other reporting such as the 2012 Annual Review of the Stratford Mining Complex, and has been the subject of much criticism by community and council members of the CCC.

Despite the large number of properties now subject to landowner agreements that largely preclude the landowners lodging complaints about the SCM operations, problematic impacts such as noise, dust and blasting reported by other landholders should be more rigorously monitored and analysed, with the results of that analysis used to guide ongoing mitigation improvements.

Adaptive Management

The EIS proposes that an adaptive approach be applied to management of impacts such as noise and for biodiversity management.

An adaptive management approach implies capacity to relax or tighten conditions on the basis of experience, but tightening generally is not considered to be an available option if it incurs costs that would change the basis on which the company's investment decisions were made. Indeed there have been few, if any, instances when consent conditions applying to mining operations at SCM have been tightened after project approvals were granted.

Adaptive environmental management cannot be employed if there is no scope to adjust subsequent actions on the basis of observations and results.

For this reason, where any uncertainty exists about the level at which constraints such as noise criteria need to be set in order to minimise adverse impact on residents or the environment, the constraints should be set conservatively.

Recommendations:

Where SCPL proposes to employ an adaptive management approach in ongoing environmental management programs at the SCM, the initial consent criteria relating to environmental impacts such as intrusive noise levels, blasting and land clearance must be set conservatively.

The conditions of consent should require the systematic analysis of complaints to establish underlying patterns relating to factors such as location and specific mine site operations. The outcomes of that analysis to be provided twice yearly to the CCC, included in the Annual Review of the Stratford Mining Complex accompanied by a summary of the CCC comment on the analysis and presented to the Department.

All new or modified environmental management plans, strategies and programs relating to the extension project should first be submitted to the CCC for comment, and when submitted for approval by regulatory agencies, should be accompanied by a summary of CCC comment on the plan or strategy.

An annual contribution should be made by SCPL to a fund that could be drawn on to obtain expert advice that would assist community and council members of the CCC in their role on the Committee. Authority to approve expenditure from the fund should rest with the General Manager of GSC, acting on the advice of the council and community members of the CCC. The fund should be cumulative, with the first annual contribution being set at $5,000 and indexed to the CPI.

5 Recommendations and Proposed Consent Conditions

(1) That the EIS be re-presented with detail about identified coal reserves, possible future mining projects and likely duration of mining at the Stratford mining complex. Further, that all relevant sections of the EIS be re-presented with alternative (viz. extended mining) scenarios addressed.

(2) That the EIS be re-presented because the socio-economic assessment provided has failed to clearly demonstrate the economic benefit of the project for NSW and the local community as specified in the DGR. A new socio-economic assessment must include an evaluation of the impact of the project on tourism and the alternative economic model being developed by The Gloucester Project, for which significant state government funding has been received.

(3) That an independent audit of the proponent's mining operations in the Gloucester Stroud Valley be undertaken and evaluated to assess the cumulative environmental and social impacts of these operations prior to any decision whether or not to approve this application.

(4) That the proposed 24-hour mining operations not be approved. Mining operations, including waste rock removal, at the Avon North open cut and the Stratford East open cut should be limited to the same operating hours proposed for the Roseville West pit extension, i.e. 0700 hours – 1800 hours seven days per week for the duration of the project.

(5) If the owners of the properties identified in the Relevant Land Ownership Plan in the EIS (Figures 1-3a, 1-3b and 1-3c) seek to sell their property for any reason during the course of this project and the property is unable to be sold because of the proximity of the Stratford mining complex, SCPL be required to acquire the property in accordance with the procedures in condition 11.1 of the BRNOC development consent (DA-39-02).

(6) That the Noise & Blasting Assessment be re-presented with:

- *noise impacts identified in terms that a layperson can understand;*
- *a comprehensive assessment of noise characteristics that would be generated by the project including presentation of C-weighted data;*
- *analysis of noise nuisance reported by neighbouring residents factored into the noise modeling;*
- *actual noise impacts assessed for all landholders within the area above the RBL noise contour.*

(7) That the re-presented Noise & Blasting Assessment be independently peer reviewed at SCPL expense by a fully independent Acoustic Consultant.

(8) That SCPL be required to provide evidence to support the assertion that mitigation measures beyond those proposed, such as restricted mining hours, are neither reasonable nor feasible.

(9) That SCPL be required to provide evidence that proposed mitigation measures are realistic from both an operational and a regulatory perspective.

(10) That SCPL be required to provide evidence that mitigation measures would be implemented in time to enable the PSNL to be achieved from commencement of the project.

(11) That the XQ fleet be deployed from project commencement. Only the new fleet vehicles and machinery should be used in connection with the new operations. The older vehicle fleet to be retired upon completion of the BRNOC operation.

(12) That SCPL be required to provide evidence to confirm that proposed noise bunding would attenuate low frequency noise.

(13) That there be a single Noise Exceedance Zone. All residents within that zone should all be subject to the same management procedures and be entitled to receive the same acoustic mitigation measures, including enhanced glazing, insulation, air conditioning etc., and/or enter into a Landowner Agreement.

(14) Where intrusive noise levels exceed the PSNL by 5dBA or more, that residents be deemed to be within a Property Acquisition Zone where SCPL must acquire the property upon the request of the owner.

(15) That the same provisions applying to private residences where the PSNL is exceeded apply to all properties where the exceedance affects more than 25% of the area of the property.

(16) That owners whose properties are outside the area where PSNL exceedance is predicted but who nevertheless experience significant noise nuisance, be entitled to have on-site noise monitoring conducted, with the cost borne by SCPL. Should that monitoring confirm PSNL exceedance at that location, the property to be deemed to be within the Noise Exceedance Zone and the owner entitled to the additional mitigation measures available to properties in that Zone.

(17) That the ground vibration criteria applied to blasting in the proposed new pits and the proposed extension of the Roseville West pit should be a PVS of 2mm/s.

(18) That blast size limits in the Avon North and Stratford East open cuts be limited to MIC 400kg, which is the limit applied to the Roseville West extension and the Bowens Road North open cut.

(19) Where a residence on a property is within 2km of the blasting location, that SCPL be required to arrange and meet the cost, of preparing a material condition report in relation to any structures on the property if requested by the property owner.

(20) That noise and blast monitoring points be established in appropriate locations to the north-east of the Avon North pit and to the south-east of the Stratford East pit.

(21) That a fully independent noise monitoring regime be implemented as a condition of consent.

(22) To provide for community input, the draft Noise Management Plan for the project to be presented to the CCC for comment before being submitted for approval.

(23) That a health audit be conducted, funded by the proponent, for all residents living within 5 km of the Stratford mining complex.

(24) That the domestic rainwater tanks of all residents living within 5 km of the Stratford mining complex be tested for heavy metal and hydrocarbon pollution. Testing to be overseen by the Department of Health and funded by the proponent.

(25) That a program of regular domestic rainwater tank cleaning and replacement of filters be implemented for residents of Stratford village. Program to be managed by Gloucester Shire Council and funded by the proponent.

(26) That monitoring of PM 2.5 dust particles be carried out in Stratford village and at Gloucester Hospital, setting a maximum of an annual average of 5 micrograms. Results to be reported quarterly to the CCC. The data collected to be made available online and in real time to enable individuals at high risk to take refuge in an air filtered room.

(27) That mine vehicle running sheets be provided to the CCC to ensure that night time dust suppression water spraying is being carried out in compliance with consent conditions.

(28) That a pollution reduction program be implemented to enforce stringent exhaust emission controls on vehicles with the aim of reducing PM2.5 levels.

(29) That rail wagons transporting coal be covered to ensure dust suppression during transport.

(30) That an integrated study be undertaken by an independent steering committee to assess the cumulative ground and surface water impacts of the Stratford Extension Project, the Rocky Hill Project and the Gloucester Gas Project. Study to be funded by all three proponents and include the total area of the Gloucester Stroud Valley that will be impacted by these projects. No project approvals to be given until this study is completed and impacts assessed.

(31) That the proposed Offset Area 1 be rejected as it is not appropriately located and is unlikely to be of enduring viability. An alternative area within the Craven Valley Wildlife Corridor with better linkages to other offset areas, and with a higher tree-hollow density, to be identified from the survey data prepared for the EIS. The ex-Allman property to be considered for this purpose.

(32) That the proponent be required to nominate additional areas that would be used as supplementary offsets in the event that monitoring finds that habitat restoration in initial offset areas has not achieved long-term viability and functionality of biodiversity.

(33) That a higher offset ratio be required. This is necessary to compensate for the generally low densities of hollow bearing trees in the offset areas, the long time lag that will occur in the establishment of replacement habitat; uncertain utilisation rate of artificial nest boxes; uncertainty of success of development of offset habitat; and the impacts on the proposed offset areas of houses, power transmission easements and planned coal seam gas infrastructure.

(34) That the Avon North open cut not extend into the forest/woodland area identified in the Ecobiological surveys as having more than 20 tree-hollows per hectare.

(35) That the Stratford East open cut not extend into the forest/woodland area identified in the Ecobiological surveys as having more than 20 tree-hollows per hectare.

(36) That night time mining not be approved in the Stratford East and Avon North open cuts because of the impact on nocturnal threatened species utilising the native vegetation remnants within and adjacent to the expanded project area.

(37) That the number of nest boxes to be placed in offset areas to compensate for losses due to clearing or isolation of habitat be supplemented by additional boxes to provide habitat for fauna likely to be displaced from areas adjoining the expanded mining area due to disturbance from noise, lighting and blasting for the duration of the project.

(38) That the draft Biodiversity Management Plan and reports on the biodiversity monitoring program be provided to the CCC for comment before being submitted to the regulatory authority, and the CCC's comments provided to the regulatory authority.

(39) To determine the affected receivers, that the proponent be required to provide mapping of the area that would be impacted by light from night operations and provide predictions of the increase in night time light (direct and indirect) that would be experienced across that area.

(40) To minimise the effect of direct and indirect light nuisance on properties in proximity to the project area and adverse impacts on nocturnal fauna in adjacent habitats, the conditions of consent to preclude night time mining operations.

(41) That Gloucester Shire Council be assigned authority for monitoring the adequacy of measures taken to reduce light pollution from the SCM complex to the minimum that is reasonably achievable.

(42) That the Non-Aboriginal Heritage Assessment of the landscape be commenced by undertaking a full and proper review of all relevant documents and attaching due weight to them, rather than taking the selective and dismissive approach evidenced in the Environmental Assessments.

(43) That a full and proper assessment of the visual impact on the landscape be made from a representative pattern of locations in the immediate area and the broader area, but placing emphasis on those sites that offer wider views over the land, particularly where those views are representative of the valley's heritage landscape significance. This critical assessment to take note of best overseas practices being used in Europe and the USA in particular, where features such as viewing angles, elevations, distance diminution, visual mass of the impacting development and a much expanded range of mitigation techniques are taken into consideration.

(44) The extensive strip plantings of trees along the Bucketts Way and other access roads will have a significant impact on the valley's heritage landscape qualities and must not be allowed to become the standard approach to mitigating visual impact. The Environmental Assessments must identify techniques that allow the landscape vistas to be retained. This may involve placing selective screen plantings closer to the sites that need to be screened and designing plantings so that distance views and vistas are retained by way of viewing corridors and open unplanted sections. As a guide, plantings should be site specific and at some distance from access routes to avoid the all-obscuring wall-of-trees effect.

(45) That full consideration be given to all aspects of the size and placement of waste rock emplacements and coal stockpiles, including the levelling and back-filling of voids to minimise their visual impact. Under the proposed mine plan, which includes concurrent rather than sequential development of three open cut pits, there will be three large voids and a high waste rock emplacement remaining at the end of the project. Landscape changes caused by these items are very

intrusive and their size and placement should be reduced through changes to the mine plan that would include backfilling of the voids.

(46) *Where SCPL proposes to employ an adaptive management approach in ongoing environmental management programs at the SCM, the initial consent criteria relating to environmental impacts such as intrusive noise levels, blasting and land clearance to be set conservatively.*

(47) *That the conditions of consent require the systematic analysis of complaints to establish underlying patterns relating to factors such as location and specific mine site operations. The outcomes of that analysis to be provided twice yearly to the CCC, included in the Annual Review of the Stratford Mining Complex accompanied by a summary of the CCC comment on the analysis, and presented to the Department.*

(48) *That all new or modified environmental management plans, strategies and programs relating to the extension project first be submitted to the CCC for comment, and when submitted for approval by regulatory agencies, be accompanied by a summary of CCC comment on the plan or strategy.*

(49) *That an annual contribution be made by SCPL to a fund that could be drawn on to obtain expert advice to assist community and council members of the CCC in their role on the Committee. Authority to approve expenditure from the fund should rest with the General Manager of GSC, acting on the advice of the council and community members of the CCC. The fund should be cumulative - with the first annual contribution being set at $5,000 - and indexed to the CPI.*