BOGGABRI COAL MINE IN THE FOREGROUND, WITH MAULES CREEK COAL MINE IN THE DISTANCE, FEBRUARY 2015 PRIOR TO SUMMER FOREST CLEARING

National Clean Air Agreement

Submission by Maules Creek community members

17 April, 2015

1. Zone of affectation by the Leard coal mine precinct

The authors and those represented in this submission are speaking on behalf of the community of Maules Creek, NSW but also draw on the experience of other residents from properties adjoining the Leard State Forest where coal mining has been in practice for longer.

The Leard Forest mine precinct is located less than half an hour's drive North East of Boggabri in the Liverpool Plains of NSW.

The surrounding regions of concern are a **30km radius of affectation** from the current centre of the mines precinct stretching north to the Nandewar Ranges, west to the Pilliga, north west to Wave Hill, east to Wean (home of the famed Wean Picnic Races) and south past Boggabri.

The Leard Forest and its immediate surrounds are now the location of three coal mines, which are expected to operate for at least 21 years from today, and possibly longer. Together they will clear at least 5,000 ha of land.

The mines are as follows:

- Tarrawonga - Whitehaven Coal - **2 million tonnes of coal per annum** (though in the 2013-2014 reporting year Whitehaven breached this limit and mined 2,136,045 tonnes, and was subsequently penalised by the EPA. Note: the breach was not identified during the course of the reporting year, but much later when the EPA examined the mine's annual return)
- Boggabri - Idemitsu Resources - **7 million tonnes of coal per annum**
- Maules Creek - Whitehaven Coal - **13 million tonnes of coal per annum**

This is a **total of 22 million tonnes per annum of coal** (hereinafter referred to as "MTA") assuming that the mining companies comply with their approval conditions, which to date not one of the three has done. Tarrawonga was fined the sum of $15,000 by the NSW EPA for exceeding its allowed per annum extraction limit in the 2014 reporting year by $8M worth of coal.

The Maules Creek Community Council states that the Maules Creek mine will cause the **deposition of 18,000 tonnes of coal dust** in the surrounding regions annually, or an estimated **30,000 tonnes of coal dust per annum** from the combined mines output.

The Maules Creek community has obtained GIPA documents from Narrabri Shire Council pointing to a history of dust complaints from the Tarrawonga and Boggabri. However, it is Whitehaven's Maules Creek mine, which is larger than both of the other Leard mines combined, that has caused fears of a devastating 21 year dust storm peaking in Year 10, by the mine's own admission.

Added to the sheer scale of the Maules Creek mine is the topography of the Leard, the Maules Creek valley and the horseshoe ring of Nandewar Ranges which appears to be trapping coal dust and depositing it on farms as far as 22 km north of the present Boggabri mine, which is the

undoubted source of the dust (see p. 16 of Pt 1, Boggabri Air Quality Impact Report which shows wind rose for Boggabri Coal mine).

Boggabri residents have also raised concerns about the impacts of the uncovered coal trains travelling on the newly built rail spur to the Leard.

Prevailing winds at Maules Creek are from the Southeast and West Northwest, and to a lesser extent, the West and South Southeast. Almost no winds originate from the North to North Northwest.

Throughout spring - summer, the dominant wind is from the Southeast and will sweep down the north-west face of the Leard Forest ridge and unimpeded across the valley until it meets the Nandewar Ranges.

Maules Creek Public School is only 6 km NW of the northernmost reaches of the Maules Creek mine. This is a critically important matter that needs to be raised with the Dept of Health and the Dept of Education.

In December 2011, coal dust emanating from Boggabri Coal and/or Tarrawonga, was found on a property approximately 22 km north of the Leard mines. Analysis was conducted by EPA, documents are available. This was before the commencement of the Maules Creek mine, and before the Boggabri Coal expansion.

COAL DUST HAZE VIEWED FROM 6 KM NORTH OF BOGGABRI & MAULES CREEK MINES - A TYPICAL MORNING

2. High priority air quality concerns

Australian Environment Ministers have agreed to work towards establishing a National Clean Air Agreement by 1 July 2016 to ensure that the community continues to enjoy clean air and to address impacts on human health and the environment.

However, this statement includes a glaring assumption, which is not borne out by reality in the affectation zone of the Leard State Forest coal mine precinct, because we no longer enjoy clean air thanks to:

- **coal extraction** at three mines, Tarrawonga, Boggabri and Maules Creek currently amounting to approximately 8 million tonnes per annum (TPA) with a fourth (Goonbri) soon to be developed
- **coal transportation** via Leard Forest rail spur which connects to Werris Creek and Upper Hunter via Boggabri
- **nitrogen dioxide** gas plumes caused by regular misfiring of explosives
- **road dust** due to intensification of traffic on unpaved roads in the area

Once exclusively an agricultural region, the Boggabri region has been overtaken by extractive industries including coal and gravel mining. To date, 66 agricultural properties have been lost to agriculture since the extractive industries began their takeover of the area, resulting in a serious decline in agricultural output, and a serious and most likely irreversible depopulation which has weakened the remaining community and rendered it very difficult to represent itself and its environmental and public health interests.

The coal industry has been eager to blame the dust problems in this area on agricultural sources. This form of blaming is disingenuous but without proper monitoring and compliance by the NSW EPA the myths about agriculture being the source of the region's dust problems are difficult to refute.

Nevertheless, below are some photographs and resident accounts, which demonstrate the air quality problems already plaguing the community near the Leard coal mines, and about to become far worse.

2.1 Coal dust

There are two concerns about coal dust:

- **suspended particulate matter** i.e. suspended in the air, and
- **deposits on surfaces**

Under Maules Creek consent, the pollutant PM 10, the maximum emissions for the averaging period of 24 hours are 50 mcg/m³ and the annual averaging period maximum is 30 mcg/m³. (i.e. mcg = microgram).

The air quality (i.e. dust) modelling by PAE Holmes, consultants, indicated there are a number of residences that are predicted to experience maximum 24-hour average PM 10 concentrations above the New South Wales Office of Environment and Heritage criterion of 50 mcg/m³, based on the impacts from the Maules Creek project alone, and that does not include Tarrawonga and Boggabri.

Cumulative impacts will also assist, however the analysis indicates that the residences most likely to experience cumulative 24-hour PM 10 impacts are those that are already predicted to be impacted from the project (i.e. Maules Creek) alone.

There are private or mine owned residences predicted to experience annual average PM 10 concentrations above the Department of Environment, Climate Change and Water goal of 30 µg/m3.

The New South Wales criteria for air quality include averaging periods, which are not included in the National Environment Protection Measures for ambient air quality (i.e. the Ambient Air-NEPM). Averaging of air quality measures allows peaks in pollution to be masked.

The dust modelling and reporting can be found in Parts 1,2 and 3 of the PAE Holmes Air Quality Impact Assessment for Maules Creek.

Years five, 10, 15 and 21 of the life of the mine correspond to years of maximum run of mine coal or overburden removed and/or minimum separation distance from sensitive residence locations. (Part 1, p 39)

The peak dust over the 21 years of the mine is predicted to be the 10th year.

PAE Holmes stated in part 1 of the Maules Creek Air Quality Impact Assessment, page 5,

> "generally, the predictions presented in this report incorporates a level of conservatism due to worst-case assumptions and the nature of dispersion modelling. As a result it is expected that actual ground level concentrations would be lower during normal operation of the project."

This statement seems blatantly false, if you believe the Planning Assessment Commission at page 29 which said it thought the dust impacts were "understated".

This highlights the shortcomings of the National Air Quality Standards when, having committed to meeting pollution standards, the NSW Government wittingly approves developments it knows will result in them being exceeded.

Technically, this is not inconsistent with the Ambient Air NEPM, as it applies only to 'background' or 'neighbourhood' situations, not locations so close to point sources. But that's a major shortcoming of the standard that should be addressed through the National Clean Air Agreement.

COAL DUST HAZE VIEWED FROM 6 KM NORTH OF BOGGABRI & MAULES CREEK MINES - A TYPICAL MORNING

2.2 Cumulative air quality impacts

Whitehaven Coal's consultants PAE Holmes themselves admit (at par 7.3, p 37) that

> "the monitoring data can only provide an indication of background air quality for existing operations. **It does not take into account, for example, any proposed future projects or modifications, such as the Boggabri Coal Continuation and Tarrawonga Modification."**

There is no confidence that the cumulative dust modelling is at all reliable, nor is there any process in place to apportion responsibility or corrective action.

Overall, the NSW Government has given permission for the mines to proceed under terms that will effectively bury the affected areas, especially the Maules Creek valley in dust over a 21 year period, **damaging health, property values, livestock quality, crop health and leading to a collapse of the local farming community.**

According to PAE Holmes, affected residences which will suffer most from cumulative impacts of coal dust are: 118a 118b 126

(See Table 8.4 extracted below)

Table 8.4: Project alone and cumulative model predictions for annual average PM_{10} concentration - µg/m³

Residence ID	Project alone				Cumulative			
	Year 5	Year 10	Year 15	Year 21	Year 5	Year 10	Year 15	Year 21
Criterion	-				*Assessment criteria – 30 µg/m³*			
17	4	4	5	4	18	18	18	18
42	6	7	6	7	19	20	20	20
53	5	6	6	6	19	20	19	20
61	2	2	2	2	20	17	17	17
67	4	6	5	6	18	19	19	19
82	3	4	4	5	17	18	18	18
103	4	5	5	4	18	18	18	18
104	6	6	6	6	19	19	20	20
105	7	8	7	7	20	21	20	21
106	6	8	7	7	20	21	21	21
108a	11	13	11	12	25	27	25	26
108b	10	12	10	3	25	26	25	26
111a	11	14	11	12	25	27	26	27
111b	7	8	7	8	20	22	21	22
116	6	8	7	8	20	22	21	22
118a	13	17	14	15	27	**31**	29	30
118b	17	21	16	18	**32**	**35**	**32**	**33**
120	4	5	5	4	19	18	19	19
122	7	9	8	9	20	22	22	23
123	6	9	7	8	20	22	21	23
126	15	21	17	19	30	**36**	**32**	**35**
134	3	4	4	5	17	18	18	19
147	3	4	3	4	16	17	17	18
162	2	2	2	2	15	15	15	16
166	2	2	2	2	15	15	15	16
168	2	2	2	3	15	16	16	16
207	2	3	3	3	16	16	16	16
225	2	3	3	11	16	16	16	16
233	1	1	1	1	14	14	14	14
236	3	3	3	3	16	16	16	16
241	1	1	1	1	14	14	14	14
242	1	2	2	2	15	14	15	15
250	2	2	2	2	16	15	15	15
256	2	2	2	2	19	17	17	17
259	2	2	2	2	18	16	16	16
264	2	2	2	2	17	16	16	16
267	3	3	3	3	19	17	17	17
269	2	3	2	3	16	16	16	16
273	2	3	3	3	18	17	17	16
277	1	1	1	1	16	17	22	23
279	0	0	0	1	27	27	26	26
281a	0	0	0	0	25	22	19	19
281b	0	0	0	0	26	22	19	19
283	2	3	3	3	17	17	17	17
285	2	2	2	3	19	17	17	17
287	2	2	2	2	20	18	17	17
291	1	1	1	1	17	15	15	15
305	0	0	1	0	15	14	14	14
313	1	1	1	1	16	15	15	15

The percentage of this privately-owned land that is predicted to be impacted by dust levels above the DECCW criteria is presented in **Table 8.7**.

Table 8.7: Percentage of privately-owned land area predicted to be impacted

Block Number	Year 5 (%)	Year 10 (%)	Year 15 (%)	Year 21 (%)
Cumulative annual average PM_{10} concentration				
DJC Watson	**28**	**98**	**69**	**92**
VA & MA Younger	10	5	**25**	**32**
MJ & ML Nott	**26**	**27**	**35**	**29**
RP & RD McGregor	**35**	9	0	0
Maximum 24-hour average PM_{10} concentration				
DJC Watson	**57**	**57**	**85**	**100**
JR Holmes	**39**	**81**	6	**53**
L & SN Compton	**51**	**72**	**30**	**51**
VA & MA Younger	**31**	**65**	**46**	**58**
CM Morse	1	**34**	7	14
CM & RRF Morse	**37**	**74**	**40**	**66**
MJ & ML Nott	**64**	**58**	**62**	**61**
PF Murphy	**33**	**68**	**27**	**46**
PR Hobden	**57**	**82**	7	1
JM Morris	9	**80**	5	**32**
MJ Brennan	11	**47**	**31**	**46**
PD & LA Finlay	**37**	**40**	**31**	**29**
LA & KA & PD Finlay	**46**	**53**	**40**	**34**
Narrabri Shire Council	**100**	**100**	**100**	**100**
Bank of NSW	0	17	0	**55**

Note: Includes land where private residences exist and are also assessed in previous sections.

It can be seen from **Table 8.7** that there are 15 properties that are predicted to experience dust impacts on more than 25% of their land area for the maximum 24-hour average PM_{10} concentration (project alone) and four for the cumulative annual average PM_{10} concentration.

As shown, there are a number of blocks of privately owned land that are predicted to experience impacts above the DECCW criteria on more than 25% of the land area up to 100%.

The Maules Creek coal mine 2011 Impact Assessment documents demonstrate the national ambient air quality standards will be exceeded at several properties when the mine is operational (i.e. now). But without any monitoring, community members have no idea where or to what extent.

2.3 Inadequacy of dust deposition monitoring

These photographs show the technology used by Boggabri Coal for its dust deposition monitoring. A black bucket with a bird poo stained funnel - clearly there has been no bird cover used.

This gives some indication of the level of seriousness with which Boggabri Coal views its dust monitoring commitment.

As for suspended particles testing, this is a mystery that the community has no access to, like most information about coal mine pollution.

The accuracy of dust measurement conducted by mines is questionable as suggested by the technology used by Boggabri Coal (pics below courtesy of Maules Creek Community Council website).

2.4 Nitrogen dioxide

On a weekly basis, the communities surrounding the Leard coal mine precinct are exposed to the possibility of blasting fumes, nitrogen dioxide gas released in varying quantities depending on how competent the operator and what atmospheric conditions are prevailing. Note the characteristic orange plume emanating from the mine.

This is regularly reported to the EPA, yet despite the fact that there is an alternative substance available to the mining industry which does not expose communities - not to mention mine employees - to the deadly fumes.

2.5 Gravel mines at Wave Hill and road transport of gravel

This July 2014 looking west towards the quarry from Wave Hill homestead.

Wave Hill is at the foothills of the Mt Kaputar Ranges. With two gravel mines, it is beset with serious problems from the carries themselves and also from the road transportation of same.

Here are some pictures which reveal the dust intensity.

The question is: If the various extractive operations are putting emissions into the atmosphere, will the emissions travel along the ranges and damage the ecosystem on Mt Kaputar. This is a monumental iconic wonder of the Narrabri district. Shouldn't it be protected for future generations?

Note also that this is grazing land, and there should be consideration of the risks to livestock and the health and quality of their meat when exposed to such levels of dust.

Once regarded as prime land, this Wave Hill grazing property is now exposed to blasts from Johnstons gravel quarry which despite EPA action still produces copious levels of dust as the pictures show.

Below is an image of a blast in November 2014.

2.6 Dust associated with road traffic, Wave Hill

Despite the fact that heavy vehicles are not legally permitted to use the short cut from Wave Hill Rd to the Leard Forest mines they regularly do so in flagrant disregard for the rules. They do so, because there is no adequate oversight by Narrabri Shire Council and the NSW EPA.

3. Coal dust reports from Maules Creek area

1. BITING THE DUST: ELDERLY COUPLE'S PROPERTY 'ENGULFED BY COAL CLOUD'
By Ross Tyson
Feb. 21, 2014, 9 a.m.

“Mr Kirkby said his own research into the health impacts of inhaling coal dust had him worried for both his and his wife’s health.
“I’m too old to get killed by it, I suppose, but I just think it’s horrific the way that they put these mines there and pretend they’re not damaging the place,” he said.
“My wife, within the last few months, has developed lung problems and is being treated by a specialist in Tamworth.
“Of course I can’t say it was caused by the dust, but it’s very toxic stuff and it is worrying.”

http://www.northerndailyleader.com.au/story/2103169/biting-the-dust-elderly-couples-property-engulfed-by-coal-cloud/

2. LARGE DUST PARTICLES IN RAINWATER

“ I have been collecting and using rainwater from the “Roslyn” Maules Creek water tank since 1991. I collect it in a 15 litre water bottle and drink it over the week when living in Neighbouring towns. I (or my family who live on the property) have never required water filters until the last four years. There are large dust particles in my water bottle (photos attached- dirt in rainwater and increase in dust particles in water) and the water filter needs cleaning every three weeks or less.”
Libby Laird

3. OVERNIGHT COAL MINING OPERATIONS NOT ACCOMPANIED BY WETTING DOWN

"Recently I have been living at Maules Creek and dropping my children off to catch the bus into Narrabri. At 7.30 am the VA Younger's paddocks adjoining the Leard forest are layered thick with heavy dust. This I believe is from overnight mining. The mining noise seems to stop between 3am and 6am. A neighbour (living closer than us) has informed me that this is the time when the mining machines that are under warranty are being serviced. Apparently after warranty that maintenance period will not exist." Libby Laird

4. WHITEHAVEN COAL TRUMPETS ITS COMMITMENT TO COMMUNITY BUT RESISTS MONITORING

Whitehaven Coal with five mines in the Narrabri Shire leaves and sets up headquarters in the Gunnedah Shire. Their advertising says they "support the communities that support us." This is a blatant message to Maules Creek locals as are their actions in asserting they will not willingly contribute the proposed Network despite their approval condtions. (See letter to John Turner below)."As Whitehaven continues to grow, we believe opening an office in the heart of Gunnedah is the natural next step in integrating us further into the community.

"We look forward to introducing more members of the Whitehaven team to you, and to making it easier for members of the local community to access information about the company and its presence and plans in the area."

http://www.nvi.com.au/story/2950370/whitehaven-to-set-up-shop-in-gunnedah/

See scanned jpeg image of advertisement "Whitehaven's Commitment to the Community" that appeared in the Narrabri Show Lift out from the Narrabri Courier paper (April 2015).

5. LONG TIME RESIDENT 6 KM FROM MINE REPORTS CONSTANT COAL DUST

"As a resident of Maules Creek the Whitehaven Maules Creek, Tarrawonga and Boggabri Mines devastated the joy of living at Maules Creek

The devastation is something that has to be experienced to be believed.

The air is polluted with dust that never seems to clear, it hangs, you can feel it.

Furniture and windowsills covered in dust (see image below).

To date there is no identifiable body that will even explain the composition of the dust.

No Health Safety Checks have been done by Local, State or Federal Government Bodies.

China I believe has a warning system when the air is polluted beyond safety levels. We must be as important.

The arrival of the MINE has divided the community. Really destroyed what was once the best place in the world to live.

At present the Namoi River is a sad gravel pit. The MINE is still trying to PUMP WATER.

We have never had to filter water except for the last four years. The used filter from drinking water is continually lined with DUST." Wilma Laird "Roslyn", 6 kms from mine sites.

6. COMMUNITY CONSULTATIVE COMMITTEES NOT GENUINELY CONCERNED ABOUT COMMUNITY

“I think a system of air quality monitoring should be in place around Baan Baa, Maules Creek due to the cumulative effect of the underground mine as well as Maules Creek and Boggabri mines. We have lobbied EPA and our local member through the CCC of the underground mine to try and get this established but there has been no progress for years. A baseline of air quality would have been good but as more and more mines come in we need to monitor asap.

As I understand it the diesel fumes are also of consideration when the cumulative effect is taken into account.

In my role with CCC of Whitehaven owned Narrabri/Baan Baa underground we have had a LOT of dust complaints over the years mostly from the dust coming off the stockpile and they have just put in an application to expand the stockpile further but they have said they are putting in dust suppression systems. I know there is a family next door with kids with asthma that are complaining and another older couple that consistently have dust in their rain water and throughout their house and so would obviously also be breathing it in. They complained once and the underground mine did a test of their rainwater saying there was less than 1% of coal dust in their water so it is ok. They pointed out that that is like eating 10 grams when drinking a litre of water and they reckon you can feel the shards of it when you rub your fingers together.

From sitting on the CCC I find it so frustrating that even when there is a spike in the air quality they can so quickly discount it for some reason or other - it just doesn’t seem to me to be an effective system when nothing ever shows up!

The other thing the CCC was pushing was for the coal train loads to be covered (empty or full) as this was a big cause of dust.” Sally Hunter, President, People for the Plains community group – Harparary Rd Harparary.

7. COAL DUST FOUND ON PROPERTIES 22 KM FROM MINE IN DIRECTION OF PREVAILING WIND

Black Muck: The EPA has investigated the Black Muck reported on resident's roofs. The lab reports that the substance is 1% coal dust, 30 – 40% clay dust (i.e. Dirt) and 50-60% vegetable matter (i.e. Mold). How the coal got on roofs in Narrabri is a mystery. The EPA have put out a press release and have instituted new measures to improve mine dust emissions. (Maules Creek Community Council Newsletter No. 9 March 2012)

8. COMMENT ON AIR QUALITY RECOMMENDATIONS FOR MINE PLANNING APPROVAL - BOGGABRI COAL[1]

"The Maules Creek Community Council has reviewed the Boggabri Coal PAC Report and is of the view that the PAC did not meet the Ministers terms of reference to assess the cumulative air quality impacts. The PAC report said;

> *"Given the limited assessment provided in relation to cumulative impacts, the Commission considers it is likely the predictions made understate the potential dust levels, should each of the potential mining proposals in the area proceed."*
>
> *"More detailed modelling of the potential cumulative impacts would be ideal, however the Commission acknowledges that mining proposals for the area will continue to evolve. By the time any further modelling was undertaken, further changes may have occurred."*
>
> *"The Commission also expects that by combining real time monitoring with sophisticated, predictive, reactive and collaborative management and shut down procedures for all the mines in the region, dust impacts from mining could be minimized and exceedences as a result of mining could be avoided".*
>
> *The net result is that there is no assessment of the cumulative air quality impacts according to the Ministers Terms of Reference but a "suck it and see" methodology designed to get an approval.*
>
> *This is not a planning system but an approval system and is a recipe for re-visiting the planning mistakes evident in the Hunter Valley.*
>
> *Despite the strong PAC report recommendations re air quality monitoring, the MCCC has no confidence that these assurances "could" minimize exceedences and we believe the 18,000 tonnes of cumulative dust emissions cannot meet the PAC's own guidelines. Recent experience regarding mine water releases from the Boggabri Coal Mine into the Namoi River shows us that "special circumstances"and "jobs" are convenient and successful arguments to circumvent planning conditions."*

9. COMMENT AIR QUAILTY MODELLING FOR MINE PLANNING APPROVAL – MAULES CREEK COAL[2]

A Peer Review of the proponents air quality modelling shows that the model was not "fit for purpose".

"The air flow in the proponent EIS was wrong. In very brief summary an independent reconciliation of dust (Peer reviewed by VIPAC) shows that 100,000 ha of land is needed for dust to be deposited to enable the projects to remain within the guidelines." Phil Laird, Maules Creek Community Council.

"We have completed a dust reconciliation of the particulate emissions from the mines in the Leard

[1] Maules Creek Community Council Newsletter No. 9 March 2012
[2] Maules Creek Community Council Newsletter No. 6. November 2011

Forest area. The annual emissions are 14,630 tonnes of Total Suspended Particulates (TSP) or roughly the equivalent of what will fit into the main Baan Baa silo (15,000 tones).

The Office of Environment and Heritage (OEH) have submitted that the air quality in the Maules Creek area already exceeds minimum air quality criteria of 50 micrograms per cubic meter. For this reason we do not see how any additional dust emissions, let alone emissions to the tune of the Baan Baa silo can maintain minimum air quality standards.

This is highly significant as the high background levels, prevailing southerly wind, inversion layers and topography of the Nandewar Range all serve to collect and concentrate this dust. We presented this information to the Dept of Planning and the Planning Assessment Commission and argued that a commitment to monitor is insufficient to gain approval."

"Dust is something the Maules Creek Community Council (not to be confused with the Maules Creek Mine consultative committee) has examined closely. Appendix 1. To this document is our PAC submission to the Maules Creek Mine proposal. Following is the recommendations we made. The second Appendix is an attached document to this document. it is the VIPAC peer review of our Dust Reconciliation. We believe there is a big question hanging over the Department of Planning in making a decision to allow these mines to go ahead."

Key Issues and Concerns – Impacts on Air Quality

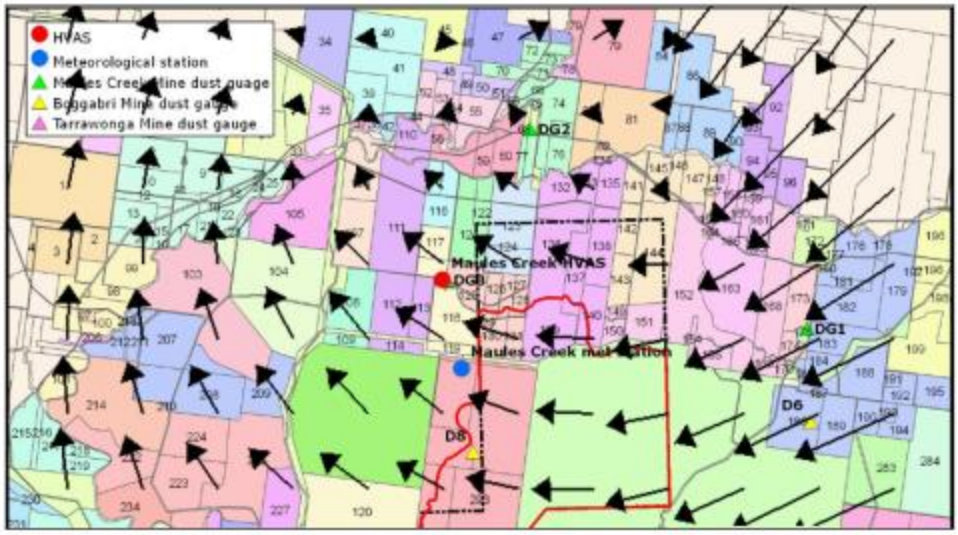
The Maules Creek community working with the Maules Creek Community Council is committed to ensuring minimal Air Quality impacts to residents and properties in the surrounding areas of the Maules Creek Coal Project and as such has engaged the services of Vipac Engineers and Scientists Ltd (Vipac) to conduct a peer review of the Air Quality Impact Assessment as provided by PAE Holmes air consultants within the project EA. The Vipac peer review is provided in Appendix 2- attached document or viewable below as Appendix 16 https://majorprojects.affinitylive.com/public/94e75df11eb6140ecfa65ae3a6b8d7ac/32.%20Maules%20Creek%20Coal%20Project%20-%20Maules%20Creek%20Community%20Council%20Submission%20-%20Part%203.pdf

The Air Quality specialist study (PAE Holmes 2011) indicates that an inversion layer will occur 41% of the time and 69% (Bridges Accoustics. 2011) of the time over winter. This is likely during periods of little or no wind.

In addition Vipac Engineers and Scientists in their peer review of the PAE Holmes Air Quality Report indicate that due to spatial variability of modelled wind conditions using CALPUFF there could also be significant "dustfall" in the area when an inversion layer is not present. Vipac's concerns are quoted below.

"This data clearly shows how variable the winds are spatially. As shown in this example hour higher wind speed should tend to carry dust off the mine site, however in other areas the winds are low. In this situation dust would be carried off site and later encounter low wind speeds resulting in significant dustfall, which a Gaussian model cannot simulate."

These concerns are shown in the Vipac diagram shown below.



The MCCC concludes from these observations that the conditions for air quality impacts are present most of the time – when there is little or no wind during inversion conditions or when there is wind present.

As mentioned in our review of health impacts the concentration of dust pollution for long periods of time will be a major source of impact to the health of local people.

It is interesting to note that the results of the PAE Holmes study has predicted that no receivers are predicted to experience air quality levels that exceed the Office of Environment and Heritage assessment criterion for annual average Total Suspended Particulates (TSP) or annual average dust deposition from the project alone or on a cumulative basis. Two properties are predicted to experience elevated annual PM10 air quality levels over more than 25% of the property area, and that the cumulative assessment of the short term 24 hour PM10 concentrations have shown that residents which are predicted to be impacted by the project alone will also be impacted on a cumulative basis.

The MCCC has serious concerns regarding the validity of the results of the PAE Holmes air quality assessment due to the existing high background dust levels, the unique topography of the Maules Creek catchment, and the resulting air flows and inversion layers that result from this unique topography.

It has been identified by Vipac that the use of a Gaussian steady state model (as used by PAE Holmes) within the environmental assessment, in adverse terrain such as the Maules Creek Project is **inappropriate** as the model does not properly account for flow steering. A simple Google search of US EPA ISCST3 (ISCMOD) led to the Wikipedia definition below.

- ISC3 - A Gaussian model used to assess pollutant concentrations from a wide variety of sources associated with an industrial complex. This model accounts for: settling and dry deposition of particles; downwash; point, area, line, and volume sources; plume rise as a function of downwind distance; separation of point sources; and limited terrain adjustment. ISC3 operates in both long-term and short-term modes.

Air Quality impacts are of upmost concern to the residents of Maules Creek and as such the MCCC has requested that the DoP instruct Aston Resources (now Whitehaven Coal) to revisit the Air Quality Impact Assessment as submitted by PAE Holmes and include validation of the ISCMOD model against a three dimensional non steady state model.
The following specific concerns as identified by Vipac need to be addressed before the MCCC can review the potential air quality impacts of the project.

- The major limitation of the assessment is the use of a Gaussian steady state model in this context is totally unsuitable. Validation against a three-dimensional non steady state model such as CALPUFF is required
- Further information is required to confirm various pit geometry parameters
- Full justification of the quality of meteorological data used
- Local terrain features are such that greater resolution is required to best reflect the local meteorological effects from significant terrain features
- Justification of the cloud cover data is required

In conversations with the Tarrawonga Coal air quality consultants PAE Holmes will be using the CALPUFF modelling software due to the local terrain. Given that Boggabri Coal and Aston Resources/Whitehaven Coal have not used this model, the MCCC believes that in order to get consistency, CALPUFF should be the modelling software used when establishing the parameters for the proposed Air Quality Monitoring Network for the Leards Forest Coal Complex.

In conclusion the Maules Creek Community Council in conjunction with Vipac believe that further work is required by PAE Holmes as recommended by Vipac to allay the uncertainty and concerns of the residents of Maules Creek before a determination of the Air Quality Impact of the project can be determined.

Recommendations

We believe there is unfinished business in establishing a clear air network in this region. In 2011 MCCC recommended the following and are still awaiting action:

- That the specific concerns raised by Vipac in their peer review be addressed by Aston Resources/Whitehaven Coal.
- That Aston Resources/ Whitehaven Coal provide the relevant information required by Vipac as stated above to the DoP and MCCC for appraisal.
- That the key issues and concerns of Vipac and the MCCC are used within the decision making process by the DoP for project consent requirements, if approved.
- That CALPUFF should be the modelling software used when establishing the parameters for the proposed Air Quality Monitoring Network for the Leards Forest Coal Complex.

In 2011 MCCC wrote:

Key Issues and Concerns - Air Quality Monitoring Nework

Open cut mining has well documented health, agricultural productivity and social impacts due to a general reduction in air quality. It is essential for ongoing sophisticated real time air quality monitoring to reduce long term company - community conflict. To minimize this potential the MCCC has submitted a list of “principles” described below to guide the development of an extensive Air Quality Monitoring Network for the area. It is important that this detailed list of principles be included in any DoP consent for this project.

Purpose of the Air Quality Monitoring Network

The Network should enable the various government agencies, local residents and other stakeholders to view the air quality of the Maules Creek area generally and in the immediate vicinity of the individual mines. The Network should be expandable to Gunnedah, Caroona and beyond as required.

The real time nature of the data should enable day-to-day tactical operational procedures (including temporary cessation of mining activities) to ensure air quality is maintained at or above minimum standards and help to identify mining practice change should it be deemed necessary. Clearly defined trigger levels should be set at various locations to help identify the need for

remedial activities. These levels would be set by DECCW is conjunction with the mines and local community and be reviewed annually.

Minimum Requirements

Based on the purpose of the Network described above, the minimum requirements to ensure accurate, timely and independent date collection and analysis are as follows:

Data Collection and Ownership

- The air quality monitoring data should be gathered by automatic, electronic, wireless monitoring stations.
- The air quality monitoring data should be collected and displayed in real time.
- The information should be displayed over various cumulative periods (e.g. 1 hour, 1 day, 1 week).
- Data should be kept indefinitely so that historical comparisons are able to be made (e.g. year on year).
- The data should be owned by DECCW or an independent authority.
- The data should be shared to the public via a link on the DECCW website.
- Ambient weather data specific to key locations within the network should also be available.

Type and Location of Monitoring Equipment

- The equipment should be designed to capture a range of particulate material and noxious gases.
- There should be a mix of equipment (e.g. PM 10, PM 2.5, PM 1.0) and blast gas monitoring equipment.
- The equipment should be located around each mine so as to capture the source of the dust or gas before the dust or gas leaves the mine site.
- Additional equipment should be located around the district in order to capture air quality levels outside the Maules Creek mining precinct to enable comparison.

Cost

- The air quality monitoring equipment capital and operational costs should be paid for by the coal mines. This would include the costs of repairs and periodic calibration.
- The cost of development and ongoing maintenance of the air quality website should be paid for by the mines and outsourced to a specialist third party.
- The costs should contain a mix of fixed and tonnage based levies to allow for expansion of the Network should there be a increase in capacity of the mines or a necessary increase in the level of service.
- Co-ordination of the repairs and maintenance should be done by DECCW.
- Co-ordination of expansion of the network should be done by DECCW.
- Minimum service levels on equipment (e.g. 24 hour maximum downtime) should be specified.

Reporting

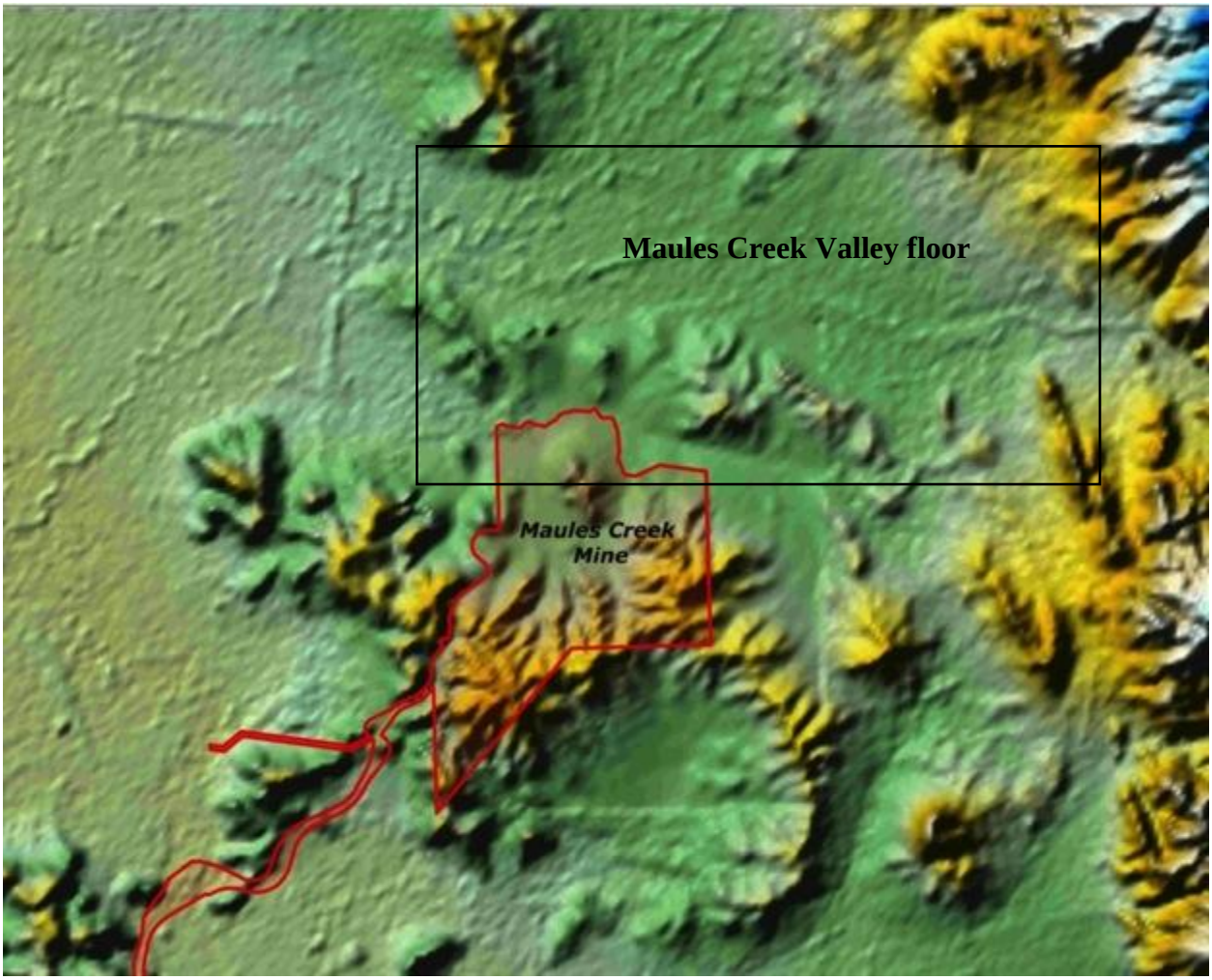
- Simple web based Graphic displays similar to the Hunter Valley Air Quality Monitoring Network be available with the ability to highlight a site and drill down into the available detailed data.
- Available detailed data to include various cumulative periods (e.g. 1 hour, 1 day, 1 week) with the ability to make historical comparisons. (e.g. hour on hour, day on day, week on week, year on year).
- Quarterly reporting by DECCW of summary air quality information including breaches and remedial activities.
- Equipment status should be available online at all times.

Recommendations

- Require Aston Resources to participate in establishing an air quality monitoring network as described above.
- The GHG emissions of the project should be considered in terms of its contributions to overall NSW emissions and Aston Resources should be required to offset these emissions in the voluntary emissions trading market to the extent identified as the GHG externality in EIA.

Health Impact Assessment

The development of a new coal mining precinct in the Leard State Forest will have significant impacts on the local people of Maules Creek. The Director Generals Requirements do not require a Health Impact Assessment (HIA) of the Maules Creek Project or its cumulative impacts with the Boggabri Coal Continuation Project or the Tarrawonga Expansion Project. **It is Recommendation that a HIA be carried out as a matter of urgency.**
The MCCC does not accept the assertions of the Maules Creek Coal economic study (Gillespie 2011) that the impacts due to noise and dust have been internalized to the project by the purchase of a number of properties in the Zone of Affectation (ZoA). Based on recent medical research (Castleden, et al 2011 and Lockwood AH et al 2009) it is clear that there will be health impacts outside the ZoA and that these costs are external to the project. Many of these costs will be borne by the local Maules Creek community.



The image taken from Fig 2.3 of the PAE Holmes Specialist Study highlights the Maules Creek Valley.

THE RECOMMENDATIONS FROM OUR MCCC MAULES CREEK COAL PAC SUBMISSION - RECONCILIATION OF THE TSP EMISSIONS

- A full audit of total cumulative TSP emissions needs to be completed for the three coal projects that take into account the inversion layers that occur 41% of the time within the Maules Creek basin.
- Existing background air quality conditions exceed OEH guidelines and there is no scope for additional dust emissions.
- That if coal mining is to occur, Underground Mining is the most viable means of maintaining air quality.
- If open cut mining is approved that an area of 104,400 hectares (32.3 kilometers x 32.3 kilometers) as identified in scenario one be used as the minimum area for the zone of affectation before any project approvals are granted. The residents in this area should be included in the Zone of Affectation until it is proven otherwise by developing a dust emission accounting as requesting by OEH.
- If open cut mining is approved that the Zone of Management be of significantly greater extent compared to the zone of affectation, possibly as much as a 30 kilometer radius from the projects central point, before any project approvals are granted, or until it is proven

otherwise that this area should not be included by real time monitoring of the cumulative effects of the three projects upon commencement of maximum production.

- That CALPUFF should be used for modeling of all dust emissions from Coal Mines in the Leard Forest Area

MANAGING WITHOUT MANAGEMENT

Many locals are exhausted telling the story and have resorted to being arrested to make this point. 350 people to date have supported this cause by giving up their freeedom. "Jobs and special circumstances" have paved these way for this project to proceed beyond our expectations. We feel that we are being given very special treatment and it defies explanation. We need dust compliance and real monitoring to ensure the safety of our children and lives.

THE APPROVAL OF THE MINES IS ALL ABOUT SELF-MONITORING.

This is not adequate. The Approval allows a mine to self-monitor and then the government pulls our area out of the Strategic Regional Land Use Plan (SRLUP). This is not good enough. i.e. The gateway process did not apply to mines that have already had development applications submitted…. NSW Cabinet can over-ride the gateway process in "exceptional circumstances," The plan mapped high conservation lands including Leard and Pilliga State Forests and then left them open to mining which does not even trigger the "gateway".

WHERE IS THE BASELINE DUST DATA?

Despite Maules Creek Community requests the EPA have not got or shown any baseline dust data. The Maules Creek Mine Approval Conditions state that: monitoring should include real time. But where is the data? How can we be safe?

Excerpt: from Maules Creek Approval - Condition 34

Air Quality and Greenhouse Gas Management Plan

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

(a) be prepared in consultation with the EPA, and be submitted to the Director-General for approval prior to the commencement of construction;

(b) describe the measures that would be implemented to ensure: best management practice is being employed; he air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and compliance with the relevant conditions of this consent.

(c) describe the proposed air quality management system;

d) include a risk/response matrix to codify mine operational responses to varying levels of risk resulting from weather conditions and specific mining activities;

e) include commitments to provide summary reports and specific briefings at CCC

meetings on issues arising from air quality monitoring;

(f) include an air quality monitoring program that:

uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the project; adequately supports the proactive and reactive air quality management system; includes $PM_{2.5}$ monitoring;

includes monitoring of occupied project-related residences and residences on air quality-affected land listed in Table 1 and Table 8, subject to the agreement of the tenant and/or landowner; evaluates and reports on the effectiveness of the air quality management system;

includes sufficient random audit of operational responses to the real time air quality management system to determine the ongoing effectiveness of these responses in maintaining the project within the relevant criteria in this Schedule and the requirements of conditions 29 and 30 above; and

includes a protocol for determining any exceedances of the relevant conditions in this approval; and

(g) includes a Leard Forest Mining Precinct Air Quality Management Strategy that has been prepared in consultation with other coal mines in the Precinct to minimise the cumulative air quality impacts of all mines within the Precinct, that includes:

systems and processes to ensure that all mines are managed to achieve their air quality criteria;

a shared environmental monitoring network and data sharing protocol;

control monitoring site(s) to provide real time data on background air quality levels (ie not influenced by mining from the Leard Forest Mining Precinct and representative of regional air quality);

a shared predictive and real time air dispersion model covering the Leard Forest Mining Precinct to be used for assessment of cumulative impacts, optimising location of the shared real time monitoring network, validation of air predictions and optimising mitigation measures; and

procedures for identifying and apportioning the source/s and contribution/s to cumulative air impacts for both mines and other sources, using the air quality and meteorological monitoring network and appropriate investigative tools such as modelling of post incident plume dispersion, dual synchronised monitors and chemical methods of source apportionment (where possible). *Notes:*

1. ***The requirement for regionally based control sites can be further reviewed if a regional air monitoring network is implemented and operated by the EPA as recommended in the draft Strategic Regional Land Use Plan for New England North West.***

2. *The Leard Forest Mining Precinct Air Quality Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area.*

3. *The management plan should be consistent with the EPA's guidance on Best Management Practice reporting and Reactive Particulate Management Strategies.*

KEY ISSUE AND CONCERN - DOCUMENTED HEALTH IMPACTS OF COAL MINING DUST EMISSIONS

There are many documents that describe the impacts of fine coal dust particles on human health. This section taken from a report by Dr Steve Robinson and Murray Pakes in Appendix 11 is a suitable summary for this analysis and is quoted verbatim. Further evidence to the health impact of PM 2.5 emissions is provided in Appendix 11 - Affidavit of Matthew Peters in evidence to the Land and Environment Court.

> "When a fine dust particle lodges in the lung the body‟s immune system mounts a defence. Macrophages transport bits of coal to the lymph nodes but most of the particle is walled off with fibrous tissue whilst the T lymphocytes neutralize some of the toxins. The body has a limited supply of these immune cells so that numbers drop throughout the rest of the body leading to increased susceptibility to infections and vaccines.

Respiratory system effects

Just a few hours exposure to acidic particles will trigger a further attack of asthma in the predisposed. Children living 1.5km from a mine have a 33% risk of asthma, at 3km the risk is 22% and at 5km it is 12%. Particularly nasty toxins called Polycyclic Aromatic Hydrocarbons (PAH) and dioxins can damage the genes causing mutations which will produce new proteins that in turn lead to new cases of asthma. The fibrosis leads to Chronic Obstructive Pulmonary Disease (**COPD** – Australia‟s fourth biggest killer) with evidence of permanent damage in children as young as 12 years old in areas with high PM2.5 rates. Lung cancer increases in these same areas due to gene damage.
In Singleton Dr Tuan Au has commenced testing the lung function of children and has already tested nearly 700 children with the aim of following them for five years.

Cardiovascular system effects

The platelets and other blood components become more viscous leading to clots in arteries whose walls have been roughened. Lipids are changed resulting in more fatty deposits in the vessel wall. Heavy metals in the coal such as nickel affect the electrical conductivity of the heart and cadmium attacks the elastic lining of vessels leading to aneurysm formation. The net effect is an increase in deaths from heart attacks and strokes. Blood vessels in the placenta are damaged leading to low birth weight babies.

Neurological system effects

Mercury breaks down the blood-brain and blood-bowel barriers letting in other toxins such as PAH which lead to a reduction in intelligence and an increase in autism and other damage which releases challenging (antisocial) behaviours.
Lead from coal and released from the roofs by acid rain running into rural rainwater tanks leads to brain damage. Arsenic is also found in coal.
The chemical toxins cause lethargy and depression with clusters of increased suicide noted downwind of one incinerator. Rare neurological syndromes occur in clusters such as a group of people with Motor Neurone disease presenting in one street in Muswellbrook. Immune disease such as Multiple Sclerosis increase.

Metabolic and other effects

> Thyroid function is often suppressed and combined with the lethargy arising from chemical toxins this can result in over-eating and excessive weight gain. Diabetes 2 rates increase. Eye diseases and skin rashes and infections all increase.
> All the above damage to physical health is compounded by the psychological stress and depression arising from enforced changes to life plans, loss of quality of life, grief at the changed landscape, perceived powerlessness etc. Noise impairs concentration and sleep. Low frequency machinery noise (28Hz) may resonate in body cavities and people‟s rooms and interfere with nerve conduction."

Key Issue and Concern - Air Quality

The Air Quality specialist study (PAE Holmes 2011) indicates that an inversion layer will persist over the Maules Creek valley floor to the north of the project area 41% of the time and 69% (Bridges Accoustics. 2011) of the time over winter. Anecdotal evidence bears this out. The topography of the surrounding Nandewar mountain ranges shown above effectively traps the inversion layer and adds to the cold air pool in the valley below due to relatively cold air which flows down slope.
The net result of the inversion layer is "that the dispersion conditions are such that dust emissions disperse slowly for a significant proportion of the time". (PAE Holmes 2011).
The mixing height data shown on page 19 of the Specialist Study shows that the mixing height only exceeds 1200 m the approx height of the surrounding mountains for 6 hours or 25% of the day. Dust emissions on some days may not clear the area and there may be a cumulative impact from the previous day that is not modelled.
The Accoustic specialist studies in Appendix G of the EA show that the inversion layer will provide a virtual ceiling in which noise is "refracted" down towards the ground. In addition dust will be trapped in the inversion layer. It follows from the inversion data and the mixing height data that noise and dust will be concentrated in the Maules Creek valley floor area for long periods of time particularly at night during winter with low winds.
In addition, Vipac Engineers and Scientists in their peer review (Appendix 16) of the PAE Holmes Air Quality Report indicate that due to modelled wind conditions using CALPUFF there could also be significant "dustfall" in the area when an inversion layer is not present.

Therefore there is the likelihood of air quality issues during periods of inversion with low winds (41% of the time) and during period where winds are present. i.e. the majority of the remaining time. This concentration of dust pollution for long periods of time will be a major source of impact to the health of local people. Many of those impacts have been described above.

Key Issue and Concern - PM 2.5

Successive studies including the proponents Air Quality Specialist Study have shown that the PM 2.5 material is of major significance when assessing impacts to health from open cut mines. The Air Quality study explains on page 9 that PM 10 emissions "*while not able to affect health, can soil materials and generally degrade the aesthetic elements of the environment*". It follows that it is the PM 2.5 emissions that effect health and the main focus of monitoring the PM 10 should be re-directed to the PM 2.5.
Because there were no existing PM 2.5 monitors in the Maules Creek district at the time of the development of the Air Quality specialist study, there can be no conclusive assurances provided by the modelling of the effects of inversion layers and mixing heights on PM 2.5 emissions. It is distinctly possible due to the prevailing southerly winds that the PM 2.5 plume could settle over the residents of the Maules Creek valley floor in serious concentrations and become a major health hazard as described by van Steenis in Appendix 13.

Recommendation

- Do a baseline survey of all residents health within the Maules Creek area prior to the commencement of large scale coal mining.
- Carry out ongoing long term monitoring of the health of all residents within the Maules Creek area to determine if there is any damage to human health including mental health.
- Require modelling of the PM 2.5 emissions be revisited each successive year in the first 5 years to determine if initial modelling is correct. This information can be used to guide modelling of PM 2.5 emissions in future modifications and expansion projects in the area.
- Put in place optional housing relocation plans for residents should monitoring show exceedences for PM 10 or PM 2.5 emissions.
- Increase the number of PM 2.5 monitors in the proposed Air Quality Monitoring Network.

10. FAMILIES AND LOCAL SCHOOL

"it's very hazy this morning (17/4/15). Boggabri Coal are doing heaps of clearing at the moment. It is really dusty. Fairfax P.S is five kms from the mine. It is in the affectation zone. This is nothing, compared to the future predictions. It is going to get even uglier later on. It's not just Whitehaven. Boggabri are putting dust up the back of Maules Creek. They are bombing our roofs with dust. Monitors need to be put in places where the dust hangs. People should be compensated for their health and water supplies. Look at the nitrous oxide. Some locals have already had a great big whiff of that in the valley. They were pretty sick. A lot won't say anything because their plan is to go. To leave the area and be bought by the mines. No one else would buy the properties. Or if they rent from the mines, to leave when it gets too dusty." Rick Laird, "Middle Creek" 6 kms from mine precinct.

4. Inversion effect – i.e. how do local climatic conditions affect dispersion

Consideration of weather conditions in coal mining practices is essential, as an inversion effect preventing the upwards dispersal of small dust particles and nitrogen dioxide means those pollutants will invert in the affected area.

This is precisely what occurs at the affectation zone of Leard coal mines to the north, i.e. Maules Creek.

Paragraph 5.1.2 of Pt 1 of PAE Holmes Maules Creek Air Quality Assessment states at Table 5.2 that "Conditions conducive to the formation of ground-based inversions" leading to "slow" dispersion of dust plumes **is likely to be 41% of the time**, which is by far the leading meteorological condition in Maules Creek.

Nevertheless, meterological conditions have been observed to have little or no influence over the practices of with Boggabri or Maules Creek coal mines. Major blasting, including multiple blasts have occurred in days of severe inversion leaving the community prey to nitrogen dioxide residues. These are reported to the mines and to the NSW EPA but the government authorities appear to be powerless to enforce the requirement that they take inversion conditions into consideration.

The omnipresent coal dust cloud shown in pictures in this report illustrates just how serious the inversion layer is in retaining dust created by overnight mining.

The mines have been approved by the NSW government (albeit under highly dubious circumstances reeking of corruption) knowing that 41% of the year their practices would be affected by the inversion conditions. yet the approval conditions are never enforced.

Leardpollution.org
www.leardpollution.org <http://www.leardpollution.org/

The community has launched its own pollution watch initiative due to our concerns over dust.

Mine monitoring website launched

Posted 5 Feb 2015, 11:40am
Thu 5 Feb 2015, 11:40am

PHOTO: There are three coal mines near the small farming community of Maules Creek in north west New South Wales. (Lisa Herbert)
MAP: Boggabri 2382

Community members from Maules Creek have come together to launch a new website to monitor the activity of the three coal mines operating in the area surrounding the Leard forest.

The website will monitor dust, noise and blasting impacts from the Tarrawonga, Boggabri and Maules Creek mines.

The Wilderness Society's Anna Christie helped set up the site and said the community has so far had to rely on the miners reports on dust.

Ms Christie said the website will allow real time reporting, and enable the community to better take their concerns to the Environment Protection Authority.

"Our role is to support the EPA and to assist them in investigating these matters," she said.

"We are going to be reporting anything that we find out to the EPA.

"The difference is that now we have control over the original data, we're not beholden to a mine to share that information."

Ms Christie said it's important the mines are kept to account.

"They are supposed to report dust and dust events and in a kind of way they do, but its a way that is purely for the sake of compliance and it doesn't enable anyone to see what is happening," she said.

http://www.abc.net.au/news/2015-02-05/mine-monitoring-website-launched/6072256?WT.ac=localnews_newengland

5. What must National Clean Air Agreement prioritise?

5.1 Regulating coal mine pollution

The National Clean Air Agreement must prioritise action on the pollution sources which are the greatest contributor to pollution levels and have the biggest impact on human health in Australia. Open cut coal mines are undoubtedly in this category.

To see this industrial haze in an agricultural setting is not just a sabotage of the future of rural communities, but more specifically their present health and epidemiological prognosis.

5.2 Strengthening reporting standards - PM2.5

In particular, reporting standards need to make $PM_{2.5}$ compulsory not just advisable under the Ambient Air Quality National Environment Protection Measure (NEPM) for particulate matter.

Strictest standards for annual and 24 hour $PM_{2.5}$ and PM_{10} pollution are called for.

Below is some information provided to the Maules Creek community by the Australian Doctors for the Environment, which is self-explanatory. It is important to bear in mind that **there is no threshold below which particle pollution from coal dust is not detrimental to human health.** There are significant health benefits from reducing particle pollution concentrations even when they are well below the national pollution standard.

5.3 Requiring industry to pay for its pollution

Health Impacts from Particulate Matter (PM2.5, PM10)

Doctors for the Environment Australia

From: Coal combustion, coal dust, trucks, diesel trains, tankers and heavy machinery used in mining, transport and loading

Causes:

- Asthma attacks
- Worsens chronic lung disease
- Increased risk of cardiovascular problems
- Contributes to lung cancer development
- Increased hospital admissions
- Increased deaths

No 'safe' level of exposure without effect

Particulate matter and diesel exhaust are Class 1 Carcinogens

Peng RD et al. Emergency admissions for cardiovascular and respiratory diseases and the chemical composition of fine particle air pollution Environ Health Perspect 2008 117:957-63
International Agency for Research on Cancer Monographs http://monographs.iarc.fr/ENG/Classification/ClassificationGroupOrder.pdf 31 Mar 2014 Accessed June 2014. Source: *Journal of Environmental Science and Health Part C, 26:339–362, 2008*

Industry groups in the Hunter Valley have attempted to obstruct the expansion of the EPA's monitoring network, and the coal mines are now doing the same thing in the Maules Creek Boggabri Gunnedah Narrabri area i.e.NE and NW NSW. For a long time, the EPA needed to negotiate with the coal industry each year to continue to fund and operate the monitoring network. During the last 18 months, though, this has changed. Now the EPA adds a levy in licence fees and funds the network that way.

The same approach is proposed in the North West, but the EPA's regional manager is saying they (the EPA and NSW Govt.) need to be persuaded "that it's absolutely necessary". It is absolutely necessary.

Despite this, some coal mines such as Whitehaven Coal and Boggabri Coal amazingly seek to cast the burden of their own pollution onto the community at large, effectively seeking to reverse a policy truism that has existed since the 1990s and is certainly not challengeable: that the polluter pays. And nevertheless they have attempted to do so, see the letter below which refers to correspondence between John Turner, chairperson of the 3 Leard coal mines:

Our reference: DOC15/85734 and DOC15/ 94163
Contact: Mr Gary Davey 6659 8230

Mr John Turner
Chair, Community Consultative Committees (Leard Forest Mines)
241 Soldiers Bay Road
SALAMANDER BAY NSW 2317

Dear Mr Turner

Thank you for your letter dated 10 March 2015 to Mr Barry Buffier, Chair and CEO, Environment Protection Authority (EPA) regarding the proposed air quality monitoring network for the New England North West region. I appreciate you bringing the concerns of the Maules Creek Coal, Tarrawonga Coal and the Boggabri Coal Community Consultative Committees to the EPA's attention.

The New England North West Strategic Regional Land Use Plan (SRLUP) included an action to progressively establish an air quality monitoring network in the Gunnedah coal mining region.
The SRLUP foreshadowed that the network would be modelled on the Upper Hunter Air Quality Monitoring Network; that is, the network would be funded by industry via a levy and established and maintained by the Office and Environment and Heritage (OEH). This model was also used for the newly commissioned Newcastle Air Quality Monitoring Network.

While I acknowledge the Committees' concerns regarding the progress towards establishing the air quality network, I can assure you that the Environment Protection Authority (EPA) and OEH have been working on this matter. It is important that any monitoring network is based on sound science and is cost effective.

The EPA met with representatives from mines in the Gunnedah Basin and the NSW Minerals Council in August 2014 to discuss the regional monitoring network. As also noted in your letter, the mining industry indicated that it is not willing to voluntarily fund a regional air quality network. The industry believes it is not the only contributor to dust emissions and that industry already funds an extensive monitoring network around the individual mining operations, including the Boggabri mining precinct.

To introduce a formal levy on industry, a regulation is required under Section 295Z of the *Protection of the Environment Operations Act 1997*. However, to establish a regulation EPA needs to:

- be satisfied that an environmental monitoring program is required; and
- obtain independent technical and health expertise on the cost-effectiveness of the proposed program.

The EPA and OEH are developing an air-shed particulate model to assess ambient particle concentrations in Gunnedah Basin as the next step to address these requirements. The model will seek to assess the relative contribution of mining to ambient particle levels within major population centres, towns and villages in the region. This work builds on the meteorological study undertaken by the EPA, which will assist in the design of the network and siting the air quality monitors if the levy is imposed.

While the EPA considers that air quality monitoring stations located in the population centres of Gunnedah and Narrabri are a priority, the air-shed modelling will be an important part of establishing whether this view

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is correct and whether there is sufficient justification for additional monitoring locations to be included. If the air-shed model confirms the EPA's views, then it will be necessary to consult with the mining industry (and any other major contributors to particulate emissions) to finalise a funding model and then levy contributions.

I also note the resolution at the recent CCC meetings that the funding for the regional monitoring network should come from the NSW Resources for Regions Scheme. The EPA is currently liaising with NSW Trade and Investment to determine whether the type of funding being sought is possible within the governance arrangements of this scheme.

As with the Upper Hunter and Newcastle air quality monitoring networks, the EPA is also committed to ensuring that the data from the network is publicly available in as close to real-time as possible. Making this data publicly available has been an important part of helping the community understand air quality in their region. To this end, there may be opportunities to improve public accessibility, understanding and access to the air quality monitoring data from some of the mine-operated air quality monitors. The EPA will be working further with the Gunnedah mines to facilitate real time data accessibility and presentation of monitoring data in a meaningful way.

I will ensure that an EPA representative attends one of the CCC meetings proposed for the period 19-20 May 2015 and have asked the EPA Armidale Region to contact you directly to make arrangements.

If you have any further questions on this issue, please contact Mr Gary Davey, Director North, EPA, on 6659 8230 or by email at gary.davey@epa.nsw.gov.au.

Yours sincerely

Mark Gifford 27/3/15

MARK GIFFORD
Acting Chair and CEO
Environment Protection Authority

These mining companies, in particular Whitehaven Coal, have spent very large sums of money wooing local communities to accept them in their midst, including swimming pools, large donations to Camp-draft, the community hall, newspaper advertising and other special interest groups, whilst ignoring the health priorities of the whole community under a blanket of misinformation. Boggabri Coal are also a large sponsor of the local campdraft.

Whitehaven Coal professes in its annual report the goal of being “Australia's lowest cost coal miner”. This is an unreasonable and untenable claim, a claim which requires it to cry poor when its air quality monitoring standards are called into question.

The Agreement must prioritise action on human health rather than focusing on the burden on polluters. The focus must be on the pollutants that create the greatest health impacts on Australians, and the pollution sources that put an unfair burden on local communities.

This matter was further examined in an ABC radio story:
http://www.abc.net.au/news/2015-04-16/environmental-regulator-looks-at-air-quality-in-the-north-west/6396372

Mining industry pushes back

It is understood the mining companies in the Gunnedah coal mining precinct have indicated they are unwilling to voluntarily fund a regional air quality network.

In a letter obtained by the ABC, the Acting Chair of the EPA, Mark Gifford, said the industry believes it was not the only contributor of dust emissions.

The letter was in response to an inquiry made by John Turner, the Chairman of the Maules Creek Community Consultative Committee, about how the proposed network would be funded.

"I note the resolution at the recent CCC (Community Consultative Committee) meetings that the funding for the regional monitoring network should come from the NSW Resources for Regions scheme," Mark Gifford said.

"The EPA is currently liaising with NSW Trade and Investment to determine whether the type of funding being sought is possible within the governance arrangements of this scheme."

Calls for more transparency

The Environment Protection Authority is now in discussion with the mining companies operating in the Gunnedah area about making their air quality data more transparent.

Mr Smith said as part of their investigation into air quality in the region, the EPA had been talking to the miners about whether they would be willing to make their current data on air quality available to the public via an online platform.

He said some of the community concern about coal dust pollution from the mines might be allayed if that data was made available.

"There is a lot of monitoring taking place already and we're talking to the mining industry about making that data available so people can already understand what's out there," Mr Smith said.

"We're talking to them about the possibility of developing a cooperative website.

"That may allay some of the fears but it will also provides us a better picture of what's happening in the environment currently."

Environmental regulator working to establish air quality monitoring network in the New England North West

By Johannah McOwan

Updated yesterday at 9:41am

The New South Wales Environment Protection Authority is investigating the impact of the mining industry on air quality in the North West, to determine whether an independent air quality monitoring network may be necessary.

PHOTO: The NSW EPA is investigating the impact of the mining industry on air quality in the state's North West (Lisa Herbert)

MAP: Gunnedah 2380

The network would be modelled on the Upper Hunter Air Quality Network and would be set up to surround the Gunnedah coal mining precinct, with stations in Gunnedah and Narrabri.

The EPA's regional manager, Simon Smith, said any decision on establishing an air monitoring network must be based on sound science and be cost effective.

"Part of the process is to gather evidence to understand where the monitoring should take place and if it's justified," he said.

Mr Smith said as part of that process, the EPA had undertaken a meteorologic study to determine air flow patterns in the valley and an audit of the 29 air quality monitoring stations that were operated and owned by mining companies in the area.

The EPA had also recently commissioned an air shed model, which will assess the contribution of the mining industry on dust pollution.

Mr Smith said like the Upper Hunter network, an air quality monitoring network in the North West would be funded via a levy on industry.

"Before we can impose a levy like that, we need to have evidence that it's absolutely necessary," he said.

"We're talking somewhere in the order of $150,000 per monitoring station, plus about $250,000 in operating costs, so they're not something you do lightly.

"You can understand that no one is willingly wanting to part with their money without that information in front of them."

5.4 Governments must commit to national clean air laws – a National Air Pollution Prevention Act

6. Analysis going forward

There is an urgent need for expert advice as to the public health implications of the Leard Forest mines, and the rail spur, and the economic and health impacts of the impending dust storm.

ALL governments must give air pollution the priority it deserves, end ongoing delays and commit to actions that will fix the biggest sources of pollution as a priority.

Furthermore, advice is sought on how to improve monitoring methodology and technology to enable the Department of Planning and Environment to properly oversee compliance by the mines.

Finally, support is needed to convince the New South Wales government that the mines have dramatically understated the radius of harm to the detriment of the present local community and the ability of any future rural communities to survive in such an environment.

Appendix 1

MCCC Maules Creek Coal PAC Submission - Reconciliation of the Total Suspended Particulate Emissions

Introduction

This document contains the MCCC cumulative dust deposition/dispersion reconciliation using figures obtained in volume two of the Maules Creek Coal Project EA, prior to the availability of the Tarrawonga expansion data. It should be read in conjunction with the new Tarrawonga TSP reconciliation contained in the main report.

Key Issue and Concern - Dust Deposition

The reconciliation of all Total Suspended Particles (TSP) has identified 10,760 tonnes of dust emissions per annum that cannot be accounted for as dust deposition within the forest. Scenario one and two of the reconciliation has identified two potential receiver scenarios for the 10,760 tonnes as either an airborne particulate matter emission or a combined airborne and dust deposition scenario.

The MCCC reconciliation shows that the 5,006 tonnes of PM10-30 that fall beyond the Leard Forest area will require a minimum of 20,857 Ha or 208 square Km in year 5 to remain within legal guidelines. This is approximately one sixth of the Maules Creek district or an area that extends 14.5 km from the edges of the Forest.

The preliminary wind spatial modeling by Vipac in the MCCC main submission for the Maules Creek Project (see diagram in Appendix 3 of this report) shows that the area to the north of the project will experience significant “dustfall” and could account for much of the dust deposition. The air quality modeling does not identify all likely receivers of these high levels of deposition.

Key Issue and Concern - Background Air Quality

Furthermore, background average PM10 levels leave very little room for additional dust emissions. OEH has shown that background airborne particulate levels already exceed the OEH maximum average 24 hr criterion of 50 micrograms/m³. This suggests that existing background levels are already beyond the 5 day exceedance limit. **Therefore we do not see any scope for additional PM 10 emissions either within or outside the project area.**

Key Issue and Concern - Airborne Particulates

OEH state that the additional proposed dust emissions from the Maules Creek Project during highly dispersive weather conditions would impact the region as a whole and this would be a highly significant addition to the regional dust load.

In particular, dust depositions will greatly exceed these levels during inversion periods. Temperature and wind inversion periods due to the terrain will reduce mixing heights from 3000 m to below 500 m thereby concentrating total suspended particulates by a factor of 6 and increasing dust deposition accordingly.

The MCCC reconciliation of dust emissions during inversion conditions (Stability Class F) with mixing heights under 500 m, which excludes background dust levels described by OEH above, shows that 104,400 Ha is required to ensure airborne particulate matter concentrations remain within legal guidelines. This area is roughly 13 times the area of the Leard State Forest and far exceeds the Zone of Affectation and Zone of Management shown in the EA. To put this in context 104,400 Ha is 1,044 Km2 and this is roughly 8% of the Narrabri Shire Council Area of 13,028 Km2.

In addition to the large area described above that is required to adequately disburse the dust emissions, it is also likely that the 25% rule will mean that many of the properties in the Maules Creek area and potentially beyond will be affected to a more or less degree.

In conclusion, the local impacts to the residents of Maules Creek are greatly enhanced due to airborne particulates and dust deposition during high probability inversion events. In addition regional cumulative impacts during highly dispersive conditions are of major concern. Given that the background levels already exceed DECCW air quality criteria, any additional emissions from the Maules Creek Project will further exceed mandated air quality levels.

We submit that until modeling and mitigation proposals can be shown to ensure that emissions remain within guidelines no approvals should be made. The project should not go ahead until verifiable scientific assurances can be made to ensure that mandated air quality standards can be met.

Due to perceived shortfalls in supervision and compliance in existing operations, and in the face of likely exceedances a strategy for monitoring is not supported.

Consideration of underground mining should be given serious consideration as substantially fewer dust emissions are produced.

Data Sources and Assumptions

Baseline figures were obtained from table 7.2, page 34, which estimated TSP emissions for each stage of the Project (kg TSP/year). See Appendix 1 of this report. Total emissions for year 5, 10, 15 and 21 for the Maules Creek Coal Project and Boggabri Coal were included, and for year 5 of the Tarrawonga project. Emission rates of TSP in table 7.2 have been developed using emission factors developed both within NSW and by the US EPA and take into account pit retention effects and source modelling that reduces emission rates for particular machinery depending on location of activity.

The distribution of particle size information was obtained from page 28 of the Air Quality Impact Assessment utilising derived information from various sources. PM 2.5 at 4.7% of TSP, PM 2.5 - 10 at 34.4% of TSP, and PM 10 - 30 at 60.9% of TSP. (PM 10 total includes PM 2.5 and is expressed as a total percentage of 39.1%).

Table 4.1: DECCW air quality standards / goals for particulate matter concentrations

Pollutant	Averaging period	Standard / Goal	Agency
Total suspended particulate matter (TSP)	Annual mean	90 µg/m^3	NHMRC
Particulate matter with an equivalent aerodynamic diameter less than 10 µm (PM10)	24-hour maximum	50 µg/m^3	NSW DECCW impact assessment criteria; NEPM reporting goal, allows five exceedances per year for bushfires and dust storms;
	Annual mean	30 µg/m^3	NSW DECCW impact assessment criteria;

Notes: µg/m^3 – micrograms per cubic metre, µm – micrometre;

Total Suspended Particulate matter (TSP) air quality standards were obtained from table 4.1, page 11 of the Air Quality Impact Assessment using DECCW air quality standards/goals and are shown above. DECCW deposited dust criteria (insoluble solids fallout) were obtained from table 4.2 of the same page and are shown below.

Table 4.2: DECCW criteria for dust (insoluble solids) fallout

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

For simplicity, an average increase in deposited dust within the Leard Forest of 4g/m²/month, was adopted by the reconciliation compiled by the MCCC over the total area of the forest of 8,134 hectares. This is considerably conservative compared to the modelled cumulative impacts of annual average dust deposition as described within the Aston EA[3].

Consideration should be given to the MCCC reconciliation under stability class F (and G) conditions as represented in table 5.2, page 19 of the EA , which predicts a frequency of occurrence of 41%, of light winds with clear skies at night and as such, dispersion is slow; and conducive to the formation of ground based inversion layers.

Table 5.2: Frequency of Occurrence of Stability Classes for CALMET (2010)

Stability Class	Frequency of Occurrence
A	4.7
B	20.1
C	16.6
D	11.2
E	6.4
F	41.0
Total	100

[3] The MCCC reconciliation does not take into account dispersion meteorology modelling, and as such should be used as a tool for considering total dust emissions in metric measurements over the time periods and scales specified.

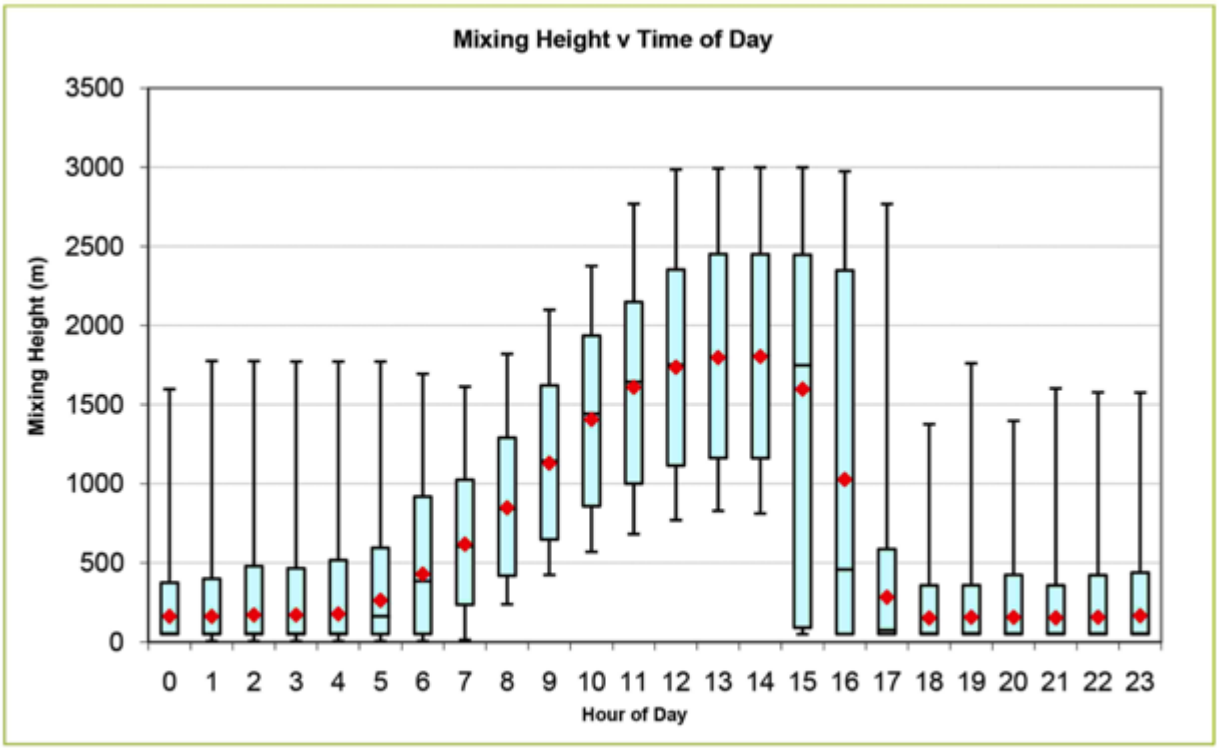


Figure 5.5: Mixing Height by Hour of the Day (generated by CALMET)

Figure 5.5 , page 20 demonstrates mixing height versus time of day and suggests a frequency of 50% of mixing heights being below 500m (13 hrs being approx below 250m), generally occurring at night coinciding with the formation of inversion layers within the Maules Creek valley floor.

Scenario one makes the assumption that all PM 10-30 not accounted for within the forest area falls as dust deposition beyond the forest at a deposition rate of 2g/m²/month , and that all PM 10 remains airborne as a concentration measured in micrograms/m³ using an annual mean of 30micrograms/m³.

Scenario two assumes that all TSP not accounted for within the forest area remains airborne as a concentration measured in micrograms/m³ using an annual mean of 90 micrograms/m³, the higher figure taking into account the larger particle sizes as a component of total TSP.

Airborne particulate matter concentrations have been calculated back to 24 hour weights and volumes to simulate average daily concentrations.

Conversion factors used in the spreadsheet are presented below.

- 1 microgram/m³ is equal to 1 kilogram/km³
- 30 microgram/m³ is equal to 30 kilogram/km³ used in PM 10 calculations
- 90 microgram/m³ is equal to 90 kilogram/km³ used in total TSP calculations (PM 2.5 - 30)
- 2g/m²/month is equal to 240kg/ha/year
- 4g/m²/month is equal to 480kg/ha/year
- 1 hectare is equal to 100m squared
- 1km² is equal to 100 hectares
- 1km³ is equal to one cubic kilometre

Table 1 - TSP deposition/dispersion Reconciliation

		Year 5	Year 10	Year 15	Year 21	**Ref No.**
Aston		6584	7862	7589	7656	
Tarrawonga		827				
Boggabri Coal		7219	7512	7396	7396	
Total tonnes TSP		**14630**	15374	14985	15052	**1**
Distribution of TSP particle size emissions within total tonnes						
PM $_{2.5}$	4.70%	687.6	723	704	707	
PM $_{2.5-10}$	34.40%	5032.7	5289	5155	5178	
PM $_{10-30}$	60.90%	8909.7	9362	9126	9167	
Total tonnes TSP		**14630**	15374	14985	15052	
Distribution of TSP particle sizes within total tonnes merging PM $_{2.5}$ and PM $_{2.5-10}$ shown as PM $_{10}$						
PM $_{10}$	39.10%	5720.3	6012	5859	5885	
PM $_{10-30}$	60.90%	8909.7	9362	9126	9167	
Total tonnes TSP		**14630**	15374	14985	15052	
Dust deposition within Leard Forest using 4g/m²/month criteria using PM $_{10-30}$ as deposition						
Leard Forest at 8134ha at 480kg/ha/year		3904	3904	3904	3904	
Total tonnes TSP used within Leard Forest		**3904**	3904	3904	3904	**2**
PM $_{10}$ not used within Leard Forest		**5720.3**	6012	5859	5885	**6**
PM $_{10-30}$ not used within Leard Forest		**5005.7**	5458	5222	5263	**4**
Total tonnes TSP not accounted for within Leard Forest deposition at 480kg/ha/year						
Total tonnes TSP		**10726**	11470	11081	11148	**3**

An explanation of the reconciliation for year five of the projects follows in sequential order, with other years similar in outcomes. (refer to **Ref No.** column in TSP deposition/dispersion reconciliation)

4. Total Tonnes of TSP from the combined Projects equals 14,630 tonnes. (See Appendix 1)
5. Total deposition of dust (PM 10-30) within the Forest equals 3,904 tonnes
6. Total TSP that did not fall within the Forest equals 10,726 tonnes
7. Scenario One dust deposition outside Forest equals 5,006 tonnes of PM 10-30

6. 5,720 tonnes of PM 10 /year remains airborne at legal concentration of 30 micrograms/m³ per day

The conclusions reached using scenario one and two for the three coal projects within the Leard Forest using year five TSP emissions as an example, identify 14,630 tonnes of TSP as the gross annual emissions of all mining activities combined.

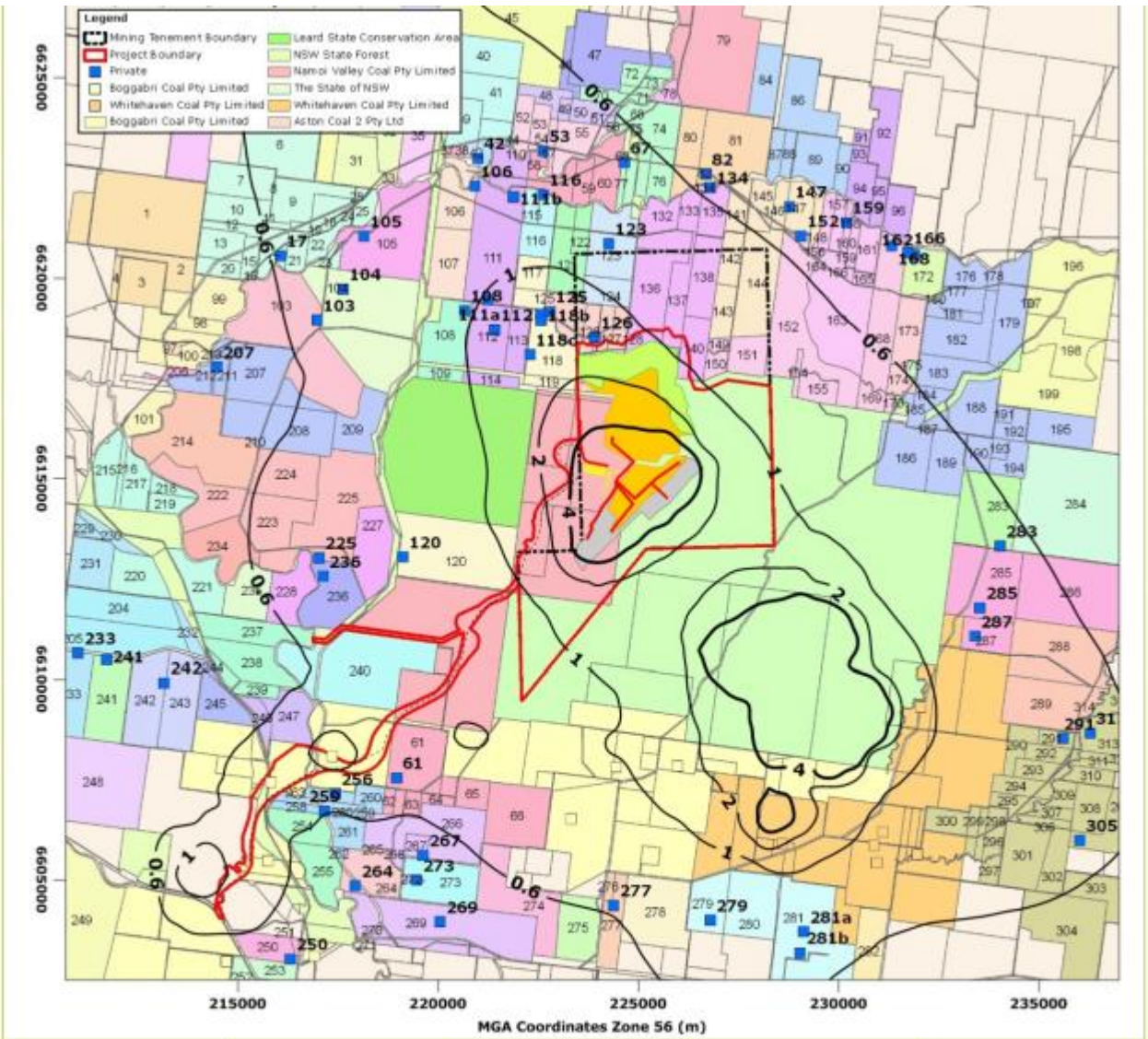
To put this in perspective, the Baan Baa Silo pictured below has a capacity of 15,000 tonnes of wheat. Given that coal dust is only 67% of the bulk density of whole wheat (Powderandbulk.com 2011. *Engineering Resources – Bulk Density Chart.)*, it would take approximately 1.5 Baan Baa silos to contain the 14,630 tonnes of annual dust emissions from the mines in the Leard Forest area.

Baan Baa Wheat Silo (http://www.flickr.com/photos/flying_donkey/4613949395/)

In order to ascertain the amount of dust emissions allowed to be deposited in the Leards Forest, a generous allowance of 3,904 tonnes has been allocated by the MCCC to an area of 8,134 hectares (the size of the forest), for dust deposition at the rate of 4g/m²/month or 480 kg/ha/year, before calculating the possible impacts the remaining 10,726 tonnes could have beyond the forest boundaries.

Scenario One

Scenario one allocates the remaining 10,726 tonnes as a dust deposition and airborne particulate matter scenario, using the PM 10 component (5,720 tonnes or 39.1%) as airborne at a concentration of 30 microgram/m³, and the dust deposition component (5,006 tonnes or 60.1%) at a deposition rate of 2g/m²/month.



Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust Deposition	Maules Creek	Year 5	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	g/m²/month	4	CALMET	J. Beaney

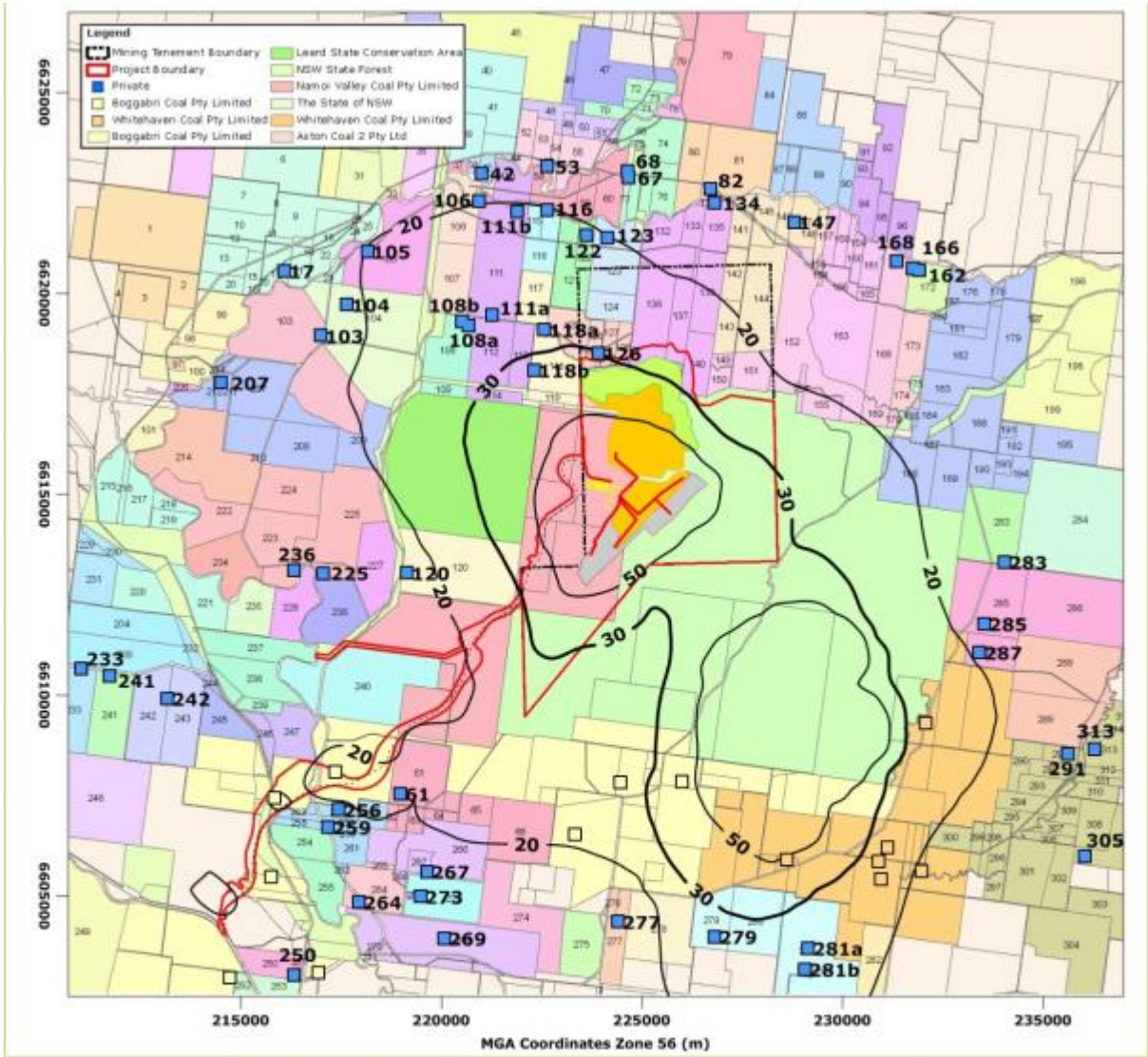
Figure 8.25: Model predictions for annual average dust deposition:

Year 5 – Cumulative

The dust deposition component PM 10 – 30 (5,006 tonnes or 60.1%), requires an additional area of 20,857 hectares or 14.5 kilometres squared to be accounted for beyond the forest area. Figure 8.25, page 75 of the EA shown above (Model predictions for annual average dust deposition: year 5 cumulative), does not account for this dust.

The airborne PM 10 component (5,720 tonnes or 39.1%), requires an area of 17,400 hectares or 13.2 kilometers squared at a mixing height of 3,000m over a 24 hour period. Figure 8.9, page 55 of the EA (Model predictions for annual average PM 10 concentrations: year 5 cumulative, could account for this dust during adequate dispersion conditions.

The airborne PM 10 component (5,720 tonnes or 39.1%), requires an area of 104,400 hectares or 32.3 kilometers squared at a mixing height of 500m (stability class F) over a 24 hour period.



Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Maules Creek	Year 5	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	$\mu g/m^3$	30	CALMET	J. Beaney

Figure 8.9: Model predictions for annual average PM_{10} concentrations: Year 5 – Cumulative

Figure 8.9, page 55 of the EA shown above (Model predictions for annual average PM 10 concentrations: year 5 cumulative), does not account for this dust during inversion events that occur 41% of the time generally and 69% over winter (Bridges Acoustics, 2011).

The scenario one reconciliation completed by the MCCC raises serious questions as to the validity of the year 5 cumulative models as presented within the EA. The allocated 10,726 tonnes/year or 29.4 tonnes a day needs to be accounted for within the air quality impact assessment as provided by PAE Holmes.

Table 2 Scenario One (PM 10 – 30 Deposition beyond the Forest, PM 10 remains airborne)

	Year 5	Year 10	Year 15	Year 21	**Ref**

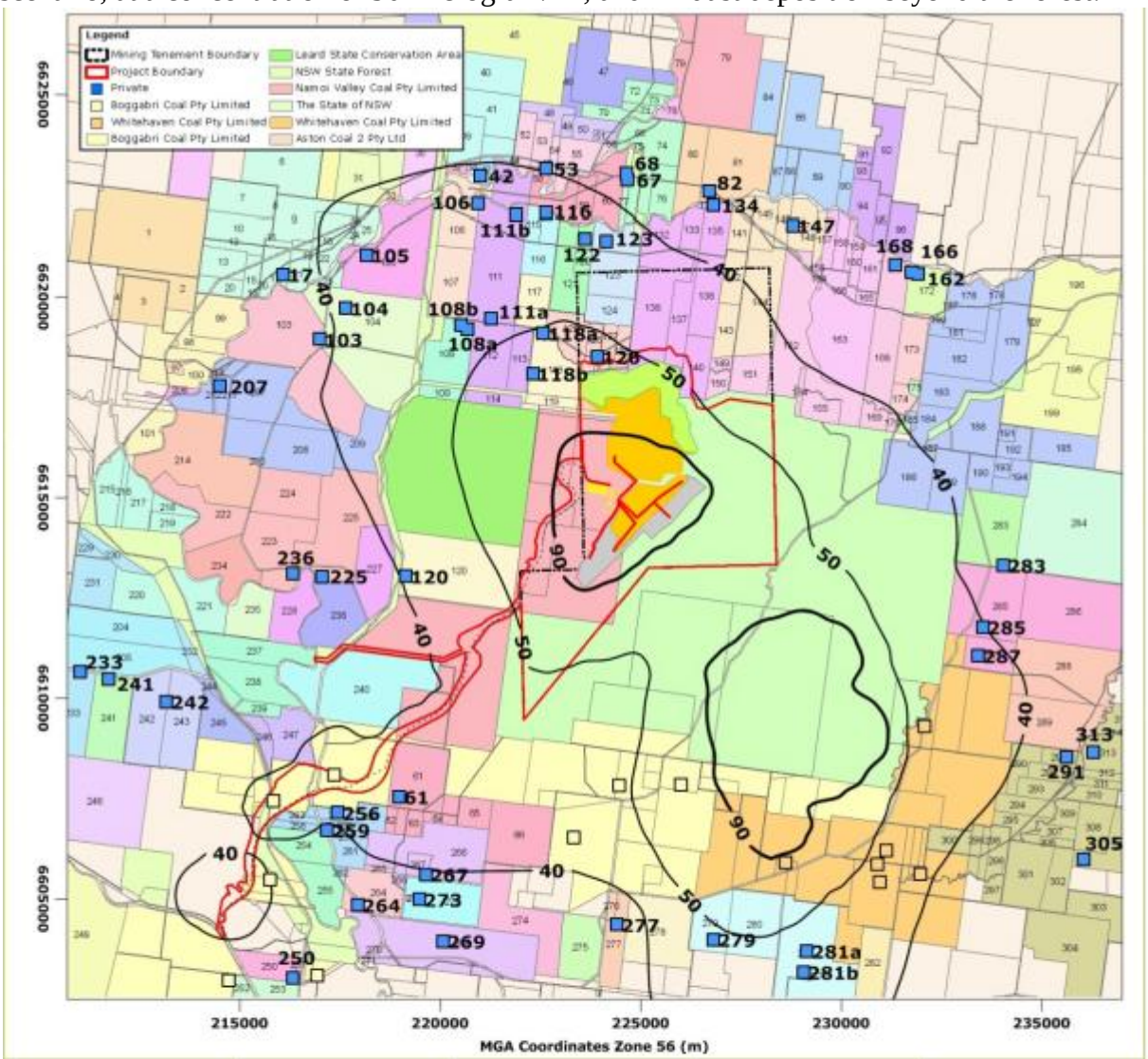
2g/m²/month of PM_{10-30} deposited beyond Leard Forest at legal deposition equates to 240kg/ha/year					
PM_{10-30} available for deposition in tonnes	**5006**	5458	5222	5263	**4**
Hectares beyond forest required for deposition	**20857**	22745	21758	21928	**5**
PM_{10} remains airborne at legal average concentration of 30 micrograms/m³					
PM_{10} available for airborne dispersal	**5720**	6012	5859	5885	**6**
Average available daily PM_{10} tonnes	**15.6712**	16.4712	16.0520	16.1232	
Km³ required for 30micrograms/m³/day	**522.4**	549	535.1	537.5	**7**
Km³ required for 3000m mixing height	174	183	178	179	
Hectares required for 3000m mixing height	**17400**	18300	17800	17900	**8**
Km³ required for 500m mixing height	1044	1098	1068	1074	
Hectares required for 500m mixing height	**104400**	109800	106800	107400	**9**

Notes:

4. Scenario One dust deposition outside Forest equals 5,006 tonnes of PM 10-30
5. 5,006 tonnes at 2g/m²/month covers 20,857 hectares/ year beyond Forest boundry
6. 5,720 tonnes of PM 10 /year remains airborne at legal concentration of 30 micrograms/m³ per day
7. 5,720 tonnes/year requires 522 km³ at legal concentrations per day
8. 522 km³ at 3000m dispersion/mixing height requires 17,400 hectares at legal concentrations per day
9. 522 km³ at 500m dispersion/mixing height requires 104,400 hectares at legal concentrations per day (stability class F inversion layer)

Scenario Two

Scenario two allocates the remaining 10,726 tonnes as a total TSP airborne particulate matter scenario, at a concentration of 90 microgram/m³, and nil dust deposition beyond the forest.



Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP	Maules Creek	Year 5	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	90	CALMET	J. Beaney

Figure 8.17: Model predictions for annual average TSP concentrations: Year 5 – Cumulative

The TSP of 10,726 tonnes requires an area of 10,800 hectares or 10.4 kilometers squared at a mixing height of 3000 m over a 24 hour period. Figure 8.17, page 65 of the EA shown above (Model predictions for annual average TSP concentrations: year 5 cumulative), **could** account for this dust during adequate dispersion conditions.

The TSP of 10,726 tonnes requires an area of 65,200 hectares or 25.5 kilometers squared at a mixing height of 500 m (stability class F) over a 24 hour period. Figure 8.17, page 65 of the EA (Model predictions for annual average TSP concentrations: year 5 cumulative), **does not** account for this dust during inversion events that occur 41% of the time.

Therefore the scenario two reconciliation raises serious questions as to the validity of the year 5 cumulative models as presented within the EA. The allocated 10,726 tonnes/year or 29.4 tonnes a day needs to be accounted for within the air quality impact assessment as provided by PAE Holmes.

Table 3 Scenario 2 (Nil Dust Deposition beyond the Forest)

	Year 5	Year 10	Year 15	Year 21	**Ref No.**
Total TSP (PM_{10} and PM_{10-30}) remains airborne at legal concentrations of 90 micrograms/m³					**10**
PM_{10} available for airborne dispersal in tonnes	5720	6012	5859	5885	**6**
PM_{10-30} available for airborne dispersal in tonnes	5006	5458	5222	5263	**4**
Total TSP available for dispersal in tonnes	**10726**	11470	11081	11148	**11**
Average daily TSP airborne emissions in tonnes	**29.4**	31.4	30.4	30.5	
Km³ required for 90 micrograms/m³/day	**326.5**	349.2	337.3	339.4	**12**
Km² required at 3000m mixing height	108.7	116.3	112.3	113	
Hectares required at 3000m mixing height	**10800**	11600	11200	11300	**13**
Km² required at 500m mixing height	652	698	674	678	
Hectares required at 500m mixing height	**65200**	69800	67400	67800	**14**

Notes

9. Scenario Two dust deposition beyond Forest NIL tonnes
10. 10726 tonnes of PM 10 and PM 10-30 /year remains airborne at legal concentrations of 90 micrograms/m³ per day
11. 10726 tonnes of PM 10 and PM 10-30 /year requires 326.5 km³ at legal concentrations per day
12. 326.5 km³ at 3000m dispersion/mixing height requires 10800 hectares at legal concentrations per day
13. 326.5 km³ at 500m dispersion/mixing height requires 65200 hectares at legal concentrations per day (stability class F inversion layer)

Key Issue and Concern – Meteorological and Air Quality Modelling

Appendix B, page 2 and 3 of the EA describes the meteorological model

> "CALMET as a meteorological pre-processor that includes a wind field generator containing objective analysis and parameterised treatments of slope flows, terrain effects and terrain blocking effects. The pre-processor produces fields of wind components, air temperature, relative humidity, mixing height and other micro meteorological variables to produce the three-dimensional meteorological

> fields that can be utilised to generate meteorological files suitable for dispersion modelling using ISCST3" (ISMOD).

The MCCC notes that, of the seven critical values used to develop the outer and inner grid of CALMET, contain TERRAD inputs of 10 km and 3 km respectively. TERRAD is the radius of influence of terrain features. (Barclay J. and Scire J. 2011)

The MCCC believes that the terrain feature of the Nandewar Ranges to the north of the project with a maximum elevation of 1,508 m, and the associated Mooki Thrust to the east and Turkey Ridge to the west of Maules Creek provide ample reasons to include a larger TERRAD input that includes these geographic features.

Pollution discharge and dilution is dependent on atmospheric conditions that are highly variable on a daily and seasonal basis and the influence of the excluded terrain features within the CALMET model is highly significant. By default this omission excludes localised terrain effects such as temperature inversion, radiation or nocturnal 'drainage' flow, katabatic or 'down-slope' air movements. Anabatic or 'up-slope' air movement, and lastly atmospheric stability whether stable, unstable or neutral. (OEH, 2011. *Local Government Air Quality Toolkit*)

Katabatic flow coupled with inversions can play a significant role in pollutant dynamics over areas such as Maules Creek. (OEH, 2011.) Cold stable air formed over the Nandewar Ranges and the Mooki Thrust plateau overnight, flows down into the Maules Creek basin where it remains trapped by the Leard Forest. The mass of cold, stable air is also under a temperature inversion and will trap and suppresses the dispersion of the TSP emissions generated by the mines. As the sun heats the ground it warms the ground above it and begins to break down the temperature inversion and restore the air to a neutral stability. (OEH, 2011)

Volume 2, section H, page 37 of the EA provides a satellite photo of the Maules Creek basin in figure 4.10. (See Appendix 2 of this report) It is clearly identified within this photo, the areas that are subjected to inversion and katabatic effects due to surrounding terrain features. The northern view sector and eastern view sector by their natural geographic features should be included within dispersion calculation modelling for this reason.

The MCCC firmly believes that CALPUFF should be used for modelling the *cumulative* effects of the mining projects, and that the 'TERRAD' input should include the terrain features as identified above.

In the Maules Creek situation, due to complex terrain and the need to accurately predict short-term concentrations, a more complicated type of model should be used. This assumes the dispersing pollutant behaves like a set of discrete 'puffs' or expanding clouds of pollutant in the atmosphere, rather than a continuous plume as in the Gaussian model. (OEH, 2011)

The VIPAC Peer Review EIS Air Quality for the Maules Creek Coal Mine qualified many of the concerns of the MCCC. Page 4 of the peer review states that;

> "It is noted that in the report wind roses are shown for the winds generated by TAPM for Maules Creek site looks appropriate with a predominance of southerly winds not apparent from other AWS data shown in the report. However visualisation of the wind fields show considerable spatial variability that would not be accounted for with a Gaussian model." See Appendix 3 of this report for a visual snapshot of the example hour mentioned above by Vipac.
>
> "This data clearly shows how variable the winds are spatially. As shown in the example hour higher wind speeds would tend to carry dust off the mine site, however in other areas the wind speeds are low. In this situation dust would be carried off site and later encounter low wind speeds resulting in significant dustfall to the north of the project and into the Maules Creek valley floor, which a Gaussian model such as ISCMOD as used in the Maules Creek Coal Project air quality impact assessment cannot simulate."

In addition, it should be noted that the High Volume Air Sampling (HVAS) results provide within the Air Quality Impact Assessment for PM10 concentrations at the Tarrawonga, Boggabri Coal and Maules Creek HVAS stations utilise a one in six day sampling cycle to determine average 24 hour PM10 concentrations. This protocol reveals trends in particulate pollution over longer periods of

months, seasons and years but may miss acute events that occur on days when sampling is not done. A sharp peak of emissions will not register if it does not coincide with a day of sampling.
Furthermore, it is important to consider the averaging period for air pollution monitoring data. Table 5.5, page 24 of the Air Quality Impact Assessment (shown below) presents the data in yearly averages.

Table 5.5: PM_{10} monitoring results from Boggabri Coal Mine HVAS and Tarrawonga Coal Mine HVAS- µg/m³

HVAS	2007 [a]	2008	2009	2010 [b]
Boggabri Coal Mine	14	11	19	17
Tarrawonga Coal Mine	13	13	21	20

[a] *Data available from May 2007*
[b] *Data available to April 2010*

Existing pollution and meteorological patterns result in the maximum measured concentrations becoming lower with longer averaging times; for example, a maximum yearly or monthly average is typically much lower than a maximum weekly or daily average.
This leads to the conclusion that the data assessed by PAE Holmes to determine PM10 concentrations may not provide an accurate account of past occurrences of dust emissions. Air quality data for the same pollutant can only be compared for similar averaging periods. Data from different averaging periods cannot be directly compared. A one in six day sampling cycle by definition only provides sampling 16.6% of the time that results in 83.4% of days or time unaccounted for. Another way to analyse the data would be to assign an accuracy rate of 16.6% or 83.4% inaccurate.
The NSW Office of Environment and Heritage (OEH) has stated within their submission to the Maules Creek Coal Project that high background concentrations of PM 10 exist within the region. Page 5 of the submission, Issue 6: states;

> "Project-alone increment is likely to exceed the 24-hr PM 10 criterion at nearby receptors to the north. Ambient monitoring shows high background concentrations of PM 10 (24-hr averages) in the region that exceed the OEH criterion of 50 micrograms/m³."

This observation alone would indicate that there is no scope for additional dust emissions.
The "25% rule" requires identifying privately owned land where more than 25% of the land is predicted to experience dust levels above the relevant DECCW criteria. This applies to privately owned land with or without a residence, including vacant land. The reconciliation for TSP deposition/dispersion has raised serious questions as to where the TSP emissions of the three projects will impact. The size of the areas identified are substantial at a sub-regional scale, considering the community of Maules Creek is landlocked by the Mooki Thrust and the volcanic Nandewar Ranges.

Conclusion

A full audit of total cumulative TSP emissions needs to be completed for the three coal projects that take into account the inversion layers that occur 41% of the time within the Maules Creek basin. The Year 5 TSP emissions of 14,630 tonnes or 40 tonnes per day are not adequately accounted for in any of the model prediction maps as presented within the Maules Creek Coal Project Environmental Assessment. This dust must either disperse or accumulate within the local environment, and, the MCCC believes that accumulation will be a real possibility when wind direction, velocity, inversion layers and the blocking effect of the Nandewar Ranges are taken into consideration.
The MCCC dust deposition/dispersion reconciliation of TSP in conjunction with the VIPAC peer review of the Maules Creek Coal Project lead the MCCC to the view that the zones of management and/or affectation for both the Maules Creek Coal Project and the Boggabri Coal Project need to be greatly enhanced spatially to include the Maules Creek valley and the Nandewar Ranges used as a boundary. The extent of affectation from the Tarrawonga Project is unknown at this time.

Recommendations

- A full audit of total cumulative TSP emissions needs to be completed for the three coal projects that take into account the inversion layers that occur 41% of the time within the Maules Creek basin.
- Existing background air quality conditions exceed OEH guidelines and there is no scope for additional dust emissions.
- That if coal mining is to occur, Underground Mining is the most viable means of maintaining air quality.
- If open cut mining is approved that an area of 104,400 hectares (32.3 kilometers x 32.3 kilometers) as identified in scenario one be used as the minimum area for the zone of affectation before any project approvals are granted. The residents in this area should be included in the Zone of Affectation until it is proven otherwise by developing a dust emission accounting as requesting by OEH.
- If open cut mining is approved that the Zone of Management be of significantly greater extent compared to the zone of affectation, possibly as much as a 30 kilometer radius from the projects central point, before any project approvals are granted, or until it is proven otherwise that this area should not be included by real time monitoring of the cumulative effects of the three projects upon commencement of maximum production.
- That CALPUFF should be used for modeling of all dust emissions from Coal Mines in the Leard Forest Area

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Key Issues and Concerns – Health Impacts

The sheer quantity of dust pollution from the mines in the Leards Forest, the frequency of inversion layers, background dust levels, predominantly southerly winds and topography of the Nandewar Range do not bode well for community health.

It is incumbent on the planning process to ensure that public health is protected. The objectives of the EP&A Act say;

> *"To encourage the proper management, development and conservation of natural resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment."*

The MCCC is of the opinion that the dust pollution from the proposed Aston Resources project of 6,584 tonnes with cumulative emissions of 14,603 tonnes per annum from all the projects does not "*promote the social ... welfare of the community*" or promote a "*better environment"*. In fact it is likely that the environment will become dangerous to health and therefore social welfare will be reduced. The Health Impacts outlined in the MCCC main submission re the impacts to air quality clearly outline those dangers.

Maules Creek Community Council

Maules Creek Coal Mine
Peer Review EIS Air Quality

Report No. 70Q-11-0312-TRP-511520-0-draft
4 Oct 2011

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Peer Review EIS Air Quality

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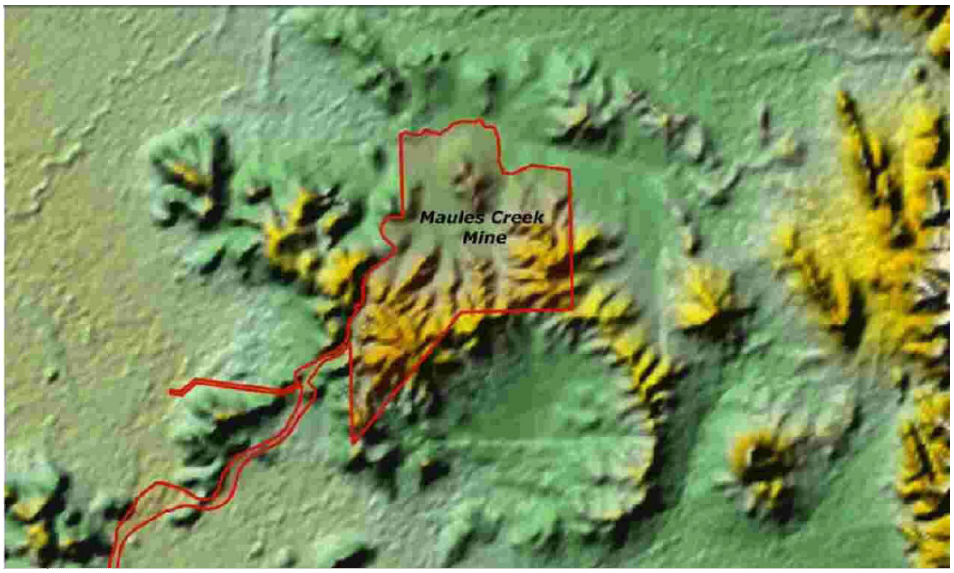
1. INTRODUCTION

The Maules Creek Community Council requested VIPAC Engineers & Scientists conduct a Peer Review of the Maules Creek Mine EIS Air Quality Assessment performed by PAE Holmes in 2011.

While the assessment implies that air quality impacts will be minimal, the confidence on the assessment is questionable for a number of reasons. These shortcomings are outlined in the following sections.

2. MODEL SELECTION

The use of a steady state Gaussian model in adverse terrain such as this is inappropriate. A Gaussian model does not properly account for flow steering. An assessment of the surrounding terrain has differential heights in immediate area of up to 100-150 m and further afield greater than 1000 m. Shown below is the terrain representation from the PAE Holmes report.

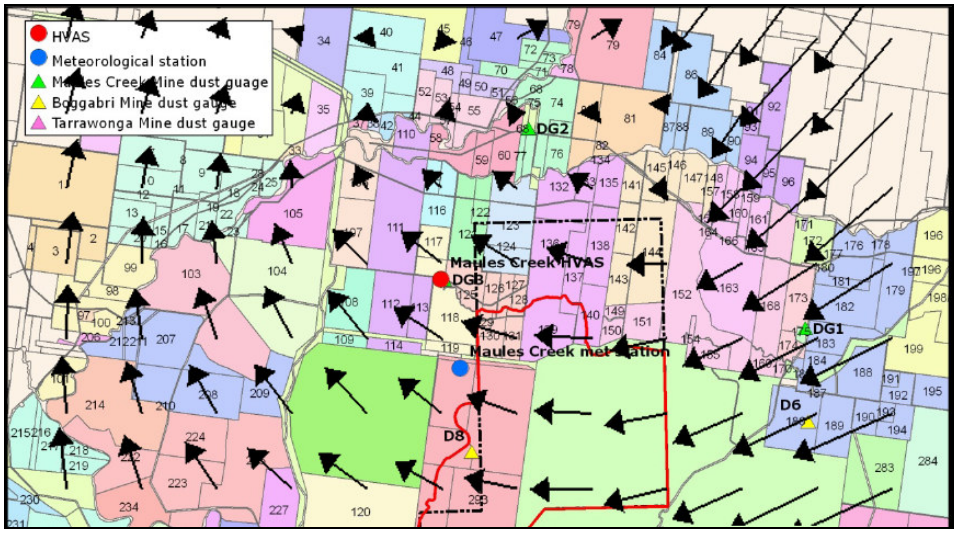


Adding to the complexity for the assessment that this brings is to the east of the site is a distinct feature that can be best described as "catchers mitt". See attached image that shows this feature. While it is acknowledged that ISCMOD is regularly used for the modelling of coal mines due to the in-pit modules are useful. However with the complexity of the surrounding terrain it is not suitable in this context alone.

It is noted that in the report wind roses are shown for the winds generated by TAPM for Maules Creek site looks appropriate with a predominance of southerly winds not apparent from other AWS data shown in the report.

However visualisation of the wind fields show considerable spatial variability that would not be accounted for with a Gaussian model. An example hour of the windfields generated by VIPAC for the area are shown for a given hour area in the Figure below.

This data clearly shows how variable the winds are spatially. As shown in this example hour higher wind speeds would tend to carry dust off the mine site, however in other areas the wind speeds are low. In this situation dust would be carried off site and later encounter low winds speeds resulting in significant dustfall, which a Gaussian model cannot simulate.



<u>The major limitation of the assessment is the use of a gaussian model in this context is totally unsuitable. Validation against a three-dimensional non steady state model such as CALPUFF is required.</u>

3. MODEL PARAMETERS

3.1 PIT SIZE PARAMETERS

No data is provided regarding the parameters for the various pit geometries used in the modelling. These are important considerations as the model used has a pit retention module, which significantly reduces emissions based on this geometry.

<u>Further information is required to confirm appropriate parameters are required.</u>

4. MET DATA

4.1 DATA AVAILABILITY

There is a large amount of meteorological data contained within the Air Quality Impact Assessment; in Table 5.1 of the assessment the meteorological data availability was summarised for the surrounding four weather stations:

- Maules Creek;
- Boggabri Coal Mine;
- Tarrawonga Coal Mine; and

- Narrabri Airport.

Table 5.1 stated that there was 12 months of data available in 2010 however wind speed and wind direction data was discontinuous with 29.9% of the data missing. This is inconsistent with Table 2 of the Existing Environment Chapter of the EIS, where it states that only September 2009-December 2009 were available with the exclusion of the month of October 2009.

Clarification and justification of the use of meteorological data is a significant issue in an assessment of this nature.

Full justification of the quality of this data is required.

4.2 HANDLING ADVERSE TERRAIN

A review of the input parameters as detailed ion Appendix B identified that there are seven cell heights, which are defined in order to calculate the flow of wind and the dispersion of pollutants in the model. The heights of these cells were not provided in Appendix B. It is noted that while the TAPM data was calculated at 1 km intervals and CALMET was calculated at 300 m intervals.

The local terrain features are such that greater resolution is required to best reflect the local meteorological effects from significant terrain features.

4.3 DATA USED FOR MODELLING – CLOUD COVER

After reviewing the wind speed and direction of the four weather stations, the meteorological data was generated using CALMET, which uses input data from weather stations, upper air and cloud data in combination with land use and terrain to predict meteorology for the local area.

In Appendix B of the Air Quality Impact Assessment, it is stated that cloud amount and cloud heights were sourced from observations at Tamworth Airport (BoM site located 90 km from Maules Creek), however the BoM weather station at Barraba is located only 45 km from Maules Creek and has a much more complete cloud dataset than Tamworth Airport for the modelling period. Further justification is required for the use of Tamworth Airport AWS in the model.

Additionally, BoM only record the cloud cover in fractions of eighths at 9 am and 3 pm, there is no nighttime cloud cover data. It can therefore be concluded that using observational data from BoM as the sole source of cloud cover data is inappropriate.

Justification of the cloud cover data used is required.

5. ASSESSMENT YEARS

The impact assessment considered four separate years during the life-time of the mine, the years selected were Year 5, Year 10, Year 15 and Year 21. Whilst these years were chosen to represent the impact in five-yearly intervals, only Year 21 assesses the maximum output of 13 Mtpa, as shown in Table 3.1 of the Air Quality Report. As a result all of the modelling scenarios do not reflect peak activity.

Discussion on the implications of differing activity is required.

6. CONCLUSION

While overall the assessment was thorough, significant uncertainties in elements of the assessment have been raised in this review that need addressing before any confidence can be had in the conclusion that there will be no health or amenity issues with the mine.