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LBL Review
Regulatory Reform and Advice Branch
Environment Protection Authority

by email: LBL.Review@epa.nsw.gov.au

Submission: load based licencing review discussion paper

Thank you for the opportunity to comment on the discussion paper for the EPA's load based licencing review and for the release of background material associated with the review.

Lock the Gate Alliance is a network of hundreds of local community groups and tens of thousands of individuals around the country that are concerned about the impacts of coal and unconventional gas mining on people, landscapes and water around the country.

We welcome this review, as we believe that the load-based licencing scheme is an important component of the regulatory system in New South Wales that is not being used to achieve pollution reductions in areas of critical importance to the communities where we work.

Specifically, the scheduled activity 'mining for coal' is responsible for a significant proportion of the emissions of a variety of damaging pollutants in New South Wales. Despite this burden of damage being inflicted by the coal mining industry in concentrated areas in the Hunter, Namoi, Lake Macquarie, Blue Mountains and the Illawarra, mining for coal does not have any assessable pollutants listed in the schedule for the load based licencing scheme.

The most obvious problem is particulate pollution. The EPA commissioned a study for the review that indicated that PM₁₀ abatement costs for the coal mining industry range from \$3637-\$104,361/tonne and damage costs are as high as \$525,313 per tonne in highly populated areas. Even if we take the lowest cost proposed in the ACIL paper for PM₁₀, the lower end of the abatement range, at \$3,637/tonne¹, it is clear that there is a significant overall cost that should be being paid by the industry. The coal mining industry overall reported 95,366 tonnes of PM₁₀ to the NPI in 2014/15,

¹ In the ACIL study, this is the lowest marginal abatement cost figure cited in Table 5 and is described as the cost of abatement of applying international best practice abatement of PM₁₀ at NSW coal mines.

a reduction on the previous year. Applying the \$3,637/tonne lower end abatement cost would mean a bill of around \$346 million for the coal mining industry for its PM₁₀ pollution. However, this is nowhere near the cost that this pollution is imposing on the NSW public. A previous EPA paper on this topic cited a Department of Environment and Conservation study that estimated a damage cost in the Hunter of \$73,000/tonne for PM₁₀². Applying this to last year's overall PM₁₀ pollution load from the coal mining industry would put the damage bill at around \$6.9 billion. Around 30% of the industry's total PM₁₀ pollution in 2014/15 was created by the three dirtiest mines in the Hunter Valley, Glencore's Ravensworth Mine Complex, Rio Tinto's Hunter Valley Operations and BHP's Mt Arthur, the biggest of them all. These mines are imposing a huge health cost on the region and the state and we urge the EPA to ensure that an appropriate cost per kilogram is imposed on the industry via the load based licencing scheme to reflect this cost.

The load-based licensing scheme was designed to reduce pollution in NSW, and is promoted by the NSW Environment Protection Authority (EPA) as an important incentive-based mechanism to encourage major industries to reduce their pollution. The failure to apply the load-based licensing scheme to coal mining in NSW means that a vital opportunity to reduce a major source of pollution is being missed and that a wealthy, profit-making industry is permitted to pollute air and water resources for free. The revenue that could be raised by applying appropriate load fees to the problem pollutants released by the coal industry into air and water in NSW could contribute to relieving the health and environmental burden these mines are placing on the public.

This submission focusses on the case for reducing pollution from coal mining via the listing of assessable pollutants for air and water pollution and the declaration of Singleton and Muswellbrook local government areas as critical zones for additional air pollutants and some water pollutants. We also make some comment on the broader structural and operational questions raised by the EPA in the Discussion Paper.

Summary of key recommendations

- Lock the Gate is urging the Government to take action against these high pollution mines and to ensure that by this time next year there is a 50% reduction in human-made sources of particle pollution, which the EPA says is required to ensure Singleton and Muswellbrook meet national clean air standards.
- The EPA should undertake management of the Hunter Valley as a "critical zone" under the load-based licencing scheme and coordinate load based licencing of air pollution, salt discharge and other pollutants from coal mining with EPLs, pollution reduction programs and the development consent process to ensure national standards are being met.
- The particulate pollutants of size PM_{2.5} should be included in the load-based licencing scheme and listed as an assessable pollutant for coal mining, petroleum exploration and production and electricity generation.

² PAEHolmes February 2013. *Methodology for valuing the health impacts of changes in particle emissions - final report*. EPA NSW. Available here: <http://www.epa.nsw.gov.au/resources/air/HealthPartEmiss.pdf>

- The pollutants for which coal mining is a major contributor in New South Wales should be listed as assessable pollutants for coal mining: pollution to air by PM₁₀, PM_{2.5}, VOCs, arsenic, PAHs and NOX and pollution to water by chromium, selenium, arsenic and lead.
- The EPA should consider the addition of new metals as assessable pollutants to waters in the load based licencing scheme, particularly aluminum, cobalt and nickel.
- The fees for the load based licensing scheme need to be increased ensuring that they meet two core functions of the scheme, that the cost imposed on pollution is greater than the cost of pollution abatement and that the cost imposed on pollution internalises the cost burden that pollution imposes on the public.
- We do not support production capacity being used as a threshold for inclusion of facilities in the scheme. Our research indicates that some coal mines with low production capacities make significant contributions to pollution loads.
- Load limits need to be continued, but we agree they can be decoupled from the LBL and imposed as a regulatory tool.
- In the absence of a national economy wide carbon price, we would support inclusion of carbon dioxide and methane as assessable pollutants for electricity generation, coal mining and petroleum exploration and production, imposing a per kilogram load-based fee for significant emitters of CO₂ and CH₄ and setting the fee rate at a level reflective of the social cost of carbon pollution, as well as complementary action to apply load limits on these greenhouse pollutants

Further discussion of these recommendations and the discussion paper is outlined below.

Air pollution

The Issues Paper recognises that coal mining is a significant source of particulate air pollution and that the omission of coal mining from the LBL scheme does not reflect the EPA's priority in addressing this major pollution problem. For air pollution, in the 2013/14 year, coal mines reported 77.3% of PM₁₀ particles, 53% of PM_{2.5}, 32.8% of airborne VOCs and 25.9% of airborne arsenic in NSW to the National Pollution Inventory. These impacts are concentrated in regions that also host large-scale power generation from coal burning, intensifying the air pollution effect on local communities.

People from the Hunter Valley are used to the orange-brown smear of sulphur pollution that hovers above Muswellbrook and the haze of coal mine dust pollution that hangs as a haze across the Singleton local government area. Anecdotal reports indicate significant problems with respiratory disease in the Hunter. The scientific evidence indicates that PM₁₀ and PM_{2.5} are having significant health impacts on people in New South Wales. This is not an amenity issue and any further delay in tackling this problem is causing harm.

According to the Government's consultation paper for its clean air plan, each year, air pollution leads to 520 premature deaths and 6300 cumulative years of life lost in Sydney and 1180 hospital admissions in the Great Sydney region, which includes the Hunter and Illawarra.

The load-based licencing scheme was designed to capture those facilities that collectively emit most of the target pollutants to the NSW environment, but it has not kept pace with the intensification of coal mining in the Hunter Valley and elsewhere.

Table 1 shows a summary of air pollutants reported to the National Pollution Inventory (NPI) in 2013/14, the number of mines that create that pollution and the proportion of the total reported pollution in NSW of that substance that is created by coal mining.

Table 1 Airborne pollution reported to the NPI in NSW (2013/14)

Pollutants	Facilities reporting	Total reported (kg)	No. of coal mines reporting	Vol. pollution from coal mines (kg)	coal mines % of total
Arsenic and compounds	215	3,994	42	1,036	25.9
Benzene	125	78,499	14	813	1.0
Fluoride and compounds	154	2,592,561	42	79,093	3.1
Lead and compounds	235	43,787	49	4,273	9.8
Mercury and compounds	249	664	48	38	5.8
NOX	396	203,114,361	48	35,890,529	17.7
PM10 - large particles	394	155,109,022	48	119,899,194	77.3
PM2.5 - fine particles	384	1,587,016	48	2,919,898	53.8
Sulphur dioxide	390	215,734,860	48	58,890	0.0
VOCs – Volatile Organic Compounds	601	11,666,197	50	3,828,108	32.8
Beryllium & compounds	194	542	34	383	70.6
Cobalt and compounds	115	2,876	41	2,095	72.8
Carbon monoxide	400	208,987,372	48	37,436,508	17.9
Chromium VI (hexavalent chromium) compounds	71	183	3	36	19.7
Cumene (isopropylbenzene; 1-methylethylbenzene)	122	3,143	34	425	13.5
Formaldehyde (methyl aldehyde)	68	430,374	11	267,681	62.2
Polycyclic aromatic hydrocarbons	354	3,716	48	956	25.7

For fine particles, cobalt and formaldehyde, coal mines produce more than half the airborne pollution reported to the NPI in NSW. Coal mines are also responsible for a significant proportion of reported arsenic, VOCs and PAHs.

The situation in the Hunter Valley’s open cuts is particularly concerning, given how many of the mines that are tightly clustered around Singleton and Muswellbrook are among the top 10 or 20 pollution sources for pollutants that are damaging to people’s health. It is no surprise that Mount Arthur, Ravensworth, Hunter Valley Operations and Mount Thorley Warkworth top the lists of pollution sources, given their size. Their proximity to each other, and to the Bayswater and Liddell power stations raises serious concerns about the cumulative impact this load, not just of particles but of toxic pollutants, might have on nearby populations. Our research indicates that several Hunter mines, including Ravensworth, have far higher rates of pollution per kilotonne of production than the average mines in 2013/14 NPI data. Peabody’s Wilpinjong mine and Glencore’s Ravensworth were the dirtiest, creating 20% of the industry’s PM₁₀ pollution and with a pollution rate per tonne of close to twice the average for Wilpinjong and more than twice for Ravensworth. That reporting year was

particularly bad for the Wilpinjong mine because of its failure to contain and prevent spontaneous combustion, and the surrounding rural community suffered the effect of that failure.

In the most recent reporting year for the NPI, in 2014/15, it was mines outside of the Hunter that produced the highest quantities and the highest rates of pollution per tonne of production to the NPI. Tarrawonga, Boggabri, Werris Creek, Rocglen and Duralie had the highest rates of PM₁₀ reported to the NPI, all five reported an increase from the previous year, with three of the Namoi mines producing particulate pollution at three times the average rate of the rest of the industry. This is an indication that the measures being used to address particulate pollution in the Hunter, including public-owned monitoring and pollution reduction programs targetting dust and diesel, should be expanded to the Namoi region.

It is also clear, however, that the measures taken to address particle pollution in the Hunter have not yet been sufficient to protect the health of the populations that live near them. Because of the close proximity of the mines to each other and to the Liddell and Bayswater power stations, there is an urgent need for the EPA to create a “critical zone” for the particulate and sulfur pollution in the Hunter, in addition to the NOX and VOC critical zone already in place in the Singleton and Muswellbrook local government areas. The cumulative load of air pollution in the Hunter is unacceptable and must be addressed using a suite of methods, including load based licencing. We believe that there is a case for this critical zone to also be the subject of additional complementary actions. These include imposition of load limits on the biggest mines for air pollution and introduction into the EPLs of concentration limits for a range of substances.

The accelerated increase in PM₁₀ pollution in the last ten years corresponds to an intensification of open-cut coal mining in the Hunter Valley. Since 1992, PM₁₀ pollution has increased 48%, but three quarters of this rise has occurred in the last twelve years. Predictive modelling commissioned by the EPA indicated that the annual average PM_{2.5} Ambient Air Quality Standard of 8µg/m³ “is unlikely to be attained in Singleton and Muswellbrook into the future as coal production in the Hunter Valley is expected to continue to increase” and that **human-made sources of this pollution need to be reduced by 50% to meet the standard**. Some of the can be attained by changing mining practices, but there must be an acceptance from the Government that there are limits to how much country can be open cut at any one time if we are to protect the population from damaging health consequences of air pollution.

This urgent air quality problem, and the stark analysis that to meet the national standard for the most damaging fine particles in the Singleton and Muswellbrook areas, human made emissions of particle pollution must be reduced by half, provides a powerful argument in favour of imposing a cap on production of coal in the Hunter Valley at a level below the current rate, and a timetable to urgently transition the industry into compliance with basic environmental standards.

A cap on production is not within the EPA’s power to impose, but as the coal being mined is a public resource, as the environmental and social impacts of the industry are causing significant conflict in the region and as a glut of coal supply in the last three years dramatically impacted the economic viability of the industry, we seek the EPA’s support in pressing this case with the Government more broadly.

The discussion paper is frank about the contribution that coal mining, particularly in the Hunter Valley, is making to sky-rocketing particulate pollution. We do not accept the premise that coal production in the Hunter has to continue increasing in scale and the EPA should not accept this either. The information objectively described in the Issues Paper clearly points to the need for a cap on coal production volumes at lower than the current levels as an urgent public health priority.

The issues paper shows that critical zones have been working. Pollution levels have decreased more in those zones than in other places. Management of the Hunter Valley as a “critical zone” for both air pollution and saline discharge and coordination of load based licencing of air pollution, salt discharge and other pollutants from coal mining with EPL pollution reduction programs and the development consent process to ensure national standards are being met.

We note that licensee responses to the survey highlighted the need to apply the scheme to carbon dioxide and methane. In the absence of a national economy wide carbon price, we would support imposing a per kilogram load based licence to significant emitters of CO₂ and CH₄ setting the fee rate at a level reflective of the social cost of carbon pollution. The load based licencing scheme is appropriate to internalise the cost of carbon and provide an incentive to reduce greenhouse pollution, but the EPA and other agencies should do this in conjunction with complementary action to apply load limits on these greenhouse pollutants that ratchet down to zero in 2030, in line with the most recent scientific analysis of pathways to prevent global warming of more than 1.5°C above pre-industrial temperatures. Almost eighty percent of NSW emissions of greenhouse gases come from the extraction, processing and burning of fossil fuels, primarily coal. The stationary energy and coal mining sectors that make up the bulk of this activity are not able to move away from the state in response to regulatory action to ensure they pay for the social and environmental cost of this pollution and so are likely to respond by reducing pollution if carbon dioxide and methane were added to the LBL scheme and listed as assessable pollutants for these activities.

Water pollution

Coal mining is also responsible for significant water pollution. As for air pollution, this is not adequately controlled by EPLs held by coal mines. Most mines that discharge water are not required to monitor for metals and those that are required to monitor metal discharges do not generally have concentration or load limits imposed on this pollution. Some of the mines discharging polluted water are doing so into creeks and rivers that feed Sydney’s drinking water catchment. Others are discharging to the enclosed coastal waters of Lake Macquarie, which is heavily populated, environmentally sensitive and much used for recreation and business. The issues paper also reports that in 2013/14, 23.6% of metals emissions to water in the Hunter region reported to the NPI, not including Lake Macquarie, were from the coal mining industry.

Though the discharge of saline water by mines in the main part of the Hunter River is subject to limits imposed by the Hunter River Salinity Trading Scheme, the discussion paper for the LBL review notes that, “there is emerging evidence that additional measures are required to address the potential impacts of the constituents of saline mine water discharges (e.g. ionic composition, metals/metalloid contamination) across the state.”

Table 2 shows the reported level of pollution to water of key pollutants in NSW and the proportion of the total reported emission of those pollutants that is contributed by coal mining.

Table 2: NSW 2013/14 NPI reported pollutant for selected water pollutants

Pollutant	Facilities reporting	Total reported (kg)	Number of coal mines reporting	Volume of pollution from coal mines (kg)	coal mines % of total
Chromium III	29	320	16	248	77.47%
Copper	34	28,804	20	50	0.17%
Lead and compounds	34	112	20	27	23.87%
Mercury and compounds	23	41	13	1	2.33%
Selenium and compounds	9	22	5	16	70.62%
Zinc and compounds	36	35,450	22	946	2.67%
Arsenic and compounds	27	482	2	17	3.49%
Cadmium and compounds	14	4	6	0.31	7.62%
Beryllium and compounds	13	14	7	2	13.23%
Boron and compounds	27	48,670	19	3,518	7.23%
Cobalt and compounds	16	66	11	55	84.08%
Fluoride and compounds	32	465,203	13	12,831	2.76%
Manganese and compounds	31	19,184	22	2,357	12.28%
Nickel and compounds	29	587	20	489	83.27%

In relation to the discharge assessable pollutants in NSW, the coal mining industry reported to the NPI in 2013/14 that it was responsible for 60% of all arsenic discharges into water sources in NSW, 23% of all lead discharges, 77% of Chromium III discharges and 71% of discharges of selenium and associated compounds. In addition to these assessable pollutants, there are a number of other pollutants that are not covered by the load-based licensing scheme that are also discharged by the coal mining industry into streams and rivers. For example, the coal mining industry was responsible for over 80% of all reported discharges of nickel and cobalt to water sources in NSW in 2013/14, according to the NPI data.

Two other significant pollutants released into waterways in New South Wales by coal mines, cobalt and nickel, are not currently assessable pollutants for any activity under the load based licensing scheme. Coal mines contributed 84% of the cobalt water pollution in NSW and 83% of the nickel pollution in 2013/14, so both of these would be candidates for listing as assessable pollutants for coal mining under the load based licensing scheme.

The underground mines of southern Sydney and the Blue Mountains are notable for the quantity of heavy metal pollution they release into surface water, some of it into tributaries that feed Sydney's drinking water catchment.

The Springvale underground mine 15km north-west of Lithgow in the Blue Mountains is licensed to

discharge mine-affected water from seven discharge points. The discharge points release water into waterways feeding two rivers - the Wolgan River, which flows north to the Capertee Valley and Wollemi, and the Cox's River, which forms part of the Hawkesbury-Nepean and flows through the Blue Mountains World Heritage Area eventually into Warragamba dam. The Cox's River also receives polluted waste water from nearby coal fired power stations. Testing carried out by researchers from the Blue Mountains Conservation Society showed that this part of the river had high levels of heavy metals including zinc, copper and manganese, 125 times more sulphate than surrounding streams and only 5% of the oxygen that fish need. The mine transfers up to 30ML per day of water from the mine workings to the Wallerawang Power Station for use in cooling towers, but if more than this volume needs to be disposed of, they discharge it straight into the Cox's River. Springvale was the largest single reported water polluter of Cobalt and compounds in NSW in 2013/14, producing 44% of the total reported that year. Springvale reported the second largest level of Chromium III pollution into water in the NPI, producing a quarter of the total amount reported that year. It was the third largest polluter of Mercury, the fourth largest polluter of Lead and the fifth largest water polluter of Copper. It also reported polluting water with Zinc, Beryllium, Boron, Fluoride and Nickel.

The EPA has required Springvale to undertake monitoring for toxic metal pollutants at upstream and downstream locations in Wangcol Creek from its sixth discharge point and undertake an assessment of the pollutants detected in water discharged in accordance with ANZECC water quality guidelines, providing this assessment to the EPA by February 2014. The EPA has stated that it intends to place water quality limits for these pollutants on discharges at this point based on the results of this assessment. The mine has been tasked by the EPA to assess, "the acute and chronic toxicity of the mine water being discharged from Licensed Discharge Point 9." It has repeatedly been found by the EPA to be in breach of its licence for exceeding limits on arsenic and other pollution from one discharge point, and for failing to monitor properly from another. After several non-compliance findings when Centennial breached the volume limit for water discharges, EPA responded by varying the licence to remove volume discharge limit.

The Planning and Assessment Commission recently approved an expansion of this mine, despite the company not yet complying with work programs requested by the EPA to assess and control water pollution. The expansion will mean an increase in the volume of water the mine discharges into the Cox's River.

Load-based licencing needs to be applied to this and other water-polluting mines, with fees set at a high enough level to discourage the mine from discharging water at all, given the sensitivity of the environment and its importance to the drinking water of the country's largest city.

The nearby Clarence mine discharges polluted water into the Wollangambe River. The EPA reviewed the Environment Protection Licence for this mine in 2015 and found that it was introducing high volume point source pollution into an area that has generally excellent water quality. The EPA found that there was very little dilution of the discharge once it joined the river, because of its high volume and headwaters location and that compared to the river upstream of the discharge, and other waterways on the Newnes Plateau, the discharged waters had elevated levels of cobalt, magnesium, nickel, strontium, sulphur and zinc, among other pollutants. Some contaminants were at levels toxic to some aquatic invertebrates and algae.

Need for load limits

There is a strong argument for the imposition of load limits on the key pollutants from coal mining to both air and water that are causing so much harm.

It is a significant gap in the management of coal mine pollution that many EPLs for coal mines do not actually impose emissions limits on many harmful pollutants. We support the continuation of load limits as a regulatory tool, but agree that this tool can be decoupled from the load-based licencing scheme and applied to any licensee to control overall loads of pollution to air and water.

Because coal mines cluster together and tend to also cluster with power stations, load limits need to be imposed for the air and water pollutants for which this industry is a major cause, including PM₁₀ to air, chromium to water, selenium to water, arsenic to water, PM_{2.5} to air, VOCs to air, arsenic to air, PAHs to air, lead to water and NOX to air. This will help control cumulative impacts where a number of mines are contributing to pollution levels that are damaging to health and the environment.

Fees

It is clear from the results of the licensee survey and the review by ACIL that the fees across the scheme are too low. Respondents in the licensee survey told the EPA that LBL fees are not a big enough cost to consider in upgrade cost-benefit analysis: LBL fees were less than the cost of upgrading equipment in 84% of the cases.

We strongly support the suggestion that pollutants that are harmful to health, like PM₁₀ or present particular regional problems, like SOX in the Hunter, should have their fees increased to drive pollution down. Because there is no safe limit for PM_{2.5}, if it is listed as an assessable pollutant it needs a high pollutant weighting to drive industry to aggressively reduce emissions at any cost. We support separate regulatory action by the EPA for off-road diesel burning by the coal industry for this reason but a pollutant weighting for PM_{2.5} that reflects the damage it does to society, death, illness and hospitalisation, is unarguably necessary.

We support these fees being set at the “damage cost.” This would be in keeping with the dual purpose of the scheme: to incentivise pollution reductions but also to implement the polluter pays principle and internalise the costs of pollution. This is crucial for the pollutants that are actually harming people’s health, like PM₁₀ and PM_{2.5} or pollutants that are causing damage to the environment, or those that are impacting on other industries, like saline discharges.

The information about the abatement and damage costs of some pollutants in the ACIL study is crucial context for setting the rate for PM₁₀. Abatement costs range from \$3,637/tonne – \$104,361/tonne and damage costs are as high as \$525,313 per tonne in highly populated areas. The discussion paper implies that imposing a load based licence fee that reflects the damage cost for particle pollution would be unreasonable, since the damage cost is so high, but this is nonsensical. The damage cost is being paid by society and by individuals who are becoming sick. Since the

industry is responsible for around 100,000 tonnes of PM₁₀ pollution annually, this would indicate a damage bill in the hundreds of billions of dollars.

Even if we take the lowest cost proposed in the ACIL paper for PM₁₀, the lower end of the abatement range, at \$3,637/tonne³, it is clear that there is a significant overall cost that should be being paid by the industry. The coal mining industry overall reported 95,366 tonnes of PM₁₀ to the NPI in 2014/15, a reduction on the previous year. Applying the \$3,637/tonne lower end abatement cost would mean a bill of around \$346 million for the coal mining industry for its PM₁₀ pollution. However, this is nowhere near the cost that this pollution is imposing on the NSW public. A previous EPA paper on this topic cited a Department of Environment and Conservation study that estimated a damage cost in the Hunter of \$73,000/tonne for PM₁₀⁴. Applying this to last year's overall PM₁₀ pollution load from the coal mining industry would put the damage bill at around \$6.9 billion. Around 30% of the industry's total PM₁₀ pollution in 2014/15 was created by the three dirtiest mines in the Hunter Valley, Glencore's Ravensworth Mine Complex, Rio Tinto's Hunter Valley Operations and BHP's Mt Arthur, the biggest of them all. These mines are imposing a huge health cost on the region and the state and we urge the EPA to ensure that an appropriate cost per kilogram is imposed on the industry via the load based licencing scheme to reflect this cost.

We are not convinced by arguments that the fee rate threshold is complex. Anyone capable of applying the first simple formula is equally able to apply the second, and those staff members responsible for calculating pollution levels from their facility would certainly be able to do this without difficulty.

Using the current approach of measuring pollution loads against production capacity, we have investigated potential fee threshold rates for different key pollutants produced by coal mining. There is wide variation in emissions per kilotonne of coal production, which lends weight to the case to keep the fee threshold weight structure, or some other system to penalise the worst offenders. For example, all 45 coal mines reporting to the NPI report emissions of PM₁₀ in 2013/14, but eight of them created emissions of that pollutant at more than twice the average rate per kilotonne of the industry as a whole, which was 399kg per kilotonne that year. These were Bloomfield, Boggabri, Duralie, Liddell, Ravensworth, Tarrawonga, Ulan and Werris Creek. Similarly, for PM_{2.5}, several mines had emissions twice the industry average in 2013/14, Bloomfield, Integra open cut, Liddell, Ravensworth, Tarrawonga, Werris Creek and Wilpinjong. Tarrawonga and Werris Creek reported creating a tonne of PM₁₀ pollution for every megatonne of coal. In 2014/15, the industry average for pollution of PM₁₀ per kilotonne of coal production was lower, at around 345kg per kilotonne, and three Namoi mines, Tarrawonga, Boggabri and Werris Creek, produced PM₁₀ pollution at three times this rate. This is again an argument that measures the EPA has introduced in the Hunter Valley should be extended to the Namoi and demonstrates a wide range of pollution rates against production.

³ In the ACIL study, this is the lowest marginal abatement cost figure cited in Table 5 and is described as the cost of abatement of applying international best practice abatement of PM₁₀ at NSW coal mines.

⁴ PAEHolmes February 2013. *Methodology for valuing the health impacts of changes in particle emissions - final report*. EPA NSW. Available here: <http://www.epa.nsw.gov.au/resources/air/HealthPartEmiss.pdf>

A similar list of mines were creating above average air pollution for arsenic in 2013/14: Bloomfield, Boggabri, Drayton (now closed), Duralie, Hunter Valley Operations, Integra open-cut, Mangoola, Ravensworth, Tarrawonga, Ulan, Werris Creek and Wilpinjong. For Benzene pollution to air, Bengalla and Mt Arthur were above the industry average, Bengalla more than five times. For lead to air, many were above average but most strikingly Mangoola, Wilpinjong and Boggabri had several times the average rate per kilotonne of production. For Nitrous oxides, eight mines had double or more the average rate of pollution per tonne of production, Ravensworth, Bloomfield, Bulga, Rix's Creek, Muswellbrook, Integra open cut and Wilpinjong.

Even with a cursory review of the rates of pollution per kilotonne of production, it is clear that there are poor performing mines that need action by the EPA to curtail their pollution.

There is likewise a wide margin of difference in the rate of water pollution per kilotonne of production. In 2013/14, Appin and West Cliff reported significantly higher rates of pollution of cadmium to water than the rest of the industry. For Chromium III to water, Springvale was four times the average and Dendrobium was eight times the average that year.

Other design questions

We would support the application of the scheme to all EPL holders but recognise that would mean diminishing returns for the regulatory and reporting and compliance effort. For that reason, we would support option 3 as outlined in section "scheduled activities" section of the issues paper, to keep the current basic structure, but refine the coverage of the LBL scheme so that the highest emitting EPA licensed activities are captured, in order to cover more than 80% of assessable pollutant emissions. We would also support expanding coverage in critical zones so that all EPL licencees are included in those areas. It is crucial that assessable pollutants are added for coal mining for both air and water pollution. We also propose removing production capacity thresholds so all premises licensed for the activity are subject to LBL regardless of the level of production.

We believe that it is important to maintain broad coverage of the scheme for multiple pollutants, even if some are deemed at the moment to not be serious problems. Industries emerge and change and pollutants that are not causing major problems now may do so in the future. In addition, the EPA's understanding of the current pollution load and its effects is very limited. It relies on estimates by operators and little if any baseline sampling is undertaken in the environment generally. Changing the regulation to add more pollutants in the future may prove difficult. Management of pollution loads needs broad coverage and broad tools.

Thanks again for the opportunity to comment on the issues paper, and for the considerable work and thought that the EPA has put into this review. We look forward to continuing to engage with the load based licencing review in 2017.

Appendix: pollution rates per Mt of coal mining production in NSW based on 2013/14 NPI data

Pollutant	No. mines reporting	Av. rate (kg per Mt)	Highest rate (kg per Mt)	Mine with highest rate	Lowest rate (kg per Mt)
Arsenic & compounds					
air	38	3.95	11.23	Duralie	0.00
water	13	8.30	78.15	Tahmoor	0.00
Benzene					
air	14	5.38	30.73	Bengalla	0.49
Cadmium & compounds					
water	6	0.01	0.03	West Cliff	0.00
Chromium (III) compounds					
water	14	5.55	48.74	Dendrobium	0.00
Copper & compounds					
water	18	1.21	8.35	Newstan	0.00
Fluoride compounds					
air	36	264.96	1,214.40	Wambo	0.79
Hydrogen sulfide					
air	2	42.85	58.80	Bloomfield	26.90
Lead & compounds					
air	44	14.20	53.92	Boggabri	0.03
water	18	0.91	10.13	Newstan	0.00
Mercury & compounds					
air	42	0.13	0.61	Duralie	0.00
water	11	0.02	0.23	Springvale	0.00
Oxides of Nitrogen					
air	43	118,334.96	399,598.86	Ravensthorpe	6,938.66
PM 10.0um					
air	43	399,209.96	1,254,579.83	Werris Creek	2,149.29
PM 2.5um					
air	43	10,636.91	46,434.05	Liddell	414.29
Selenium & compounds					
water	5	1.90	9.17	Bloomfield	0.00
Sulfur dioxide					
air	43	173.46	1,754.87	Wambo	4.55
Total Nitrogen					
water	4	459.71	1,401.28	Dendrobium	16.60
Total Phosphorus					
water	4	6.15	18.28	Dendrobium	0.98
Total VOCs					
air	43	12,165.62	77,556.75	Bulga	349.80
Zinc and compounds					
water	20	17.89	155.35	Clarence	0.00