
UPPER HUNTER AIR QUALITY ADVISORY COMMITTEE (UHAQAC)

MEETING MINUTES – Meeting 20

Date: 28 April 2016

Time: 10:00am – 1:00 pm

File: EF13/5718, DOC16/402261-01

Meeting Location: Singleton Civic Centre, Auditorium Meeting Room.

In attendance: John Tate (Chairperson), Mayor Wayne Bedggood, Dr Catherine Chicken, Dr Craig Dalton, Ben Harrison, Lindy Hyam, John Krey, Geoffrey Sharrock, John Watson.

Office of Environment and Heritage (OEH): Alan Betts.

Environment Protection Authority (EPA): Mitchell Bennett, Emma Coombs, Leanne Graham.

Apologies: Morgana Gidley-Baird, Lyn MacBain, Andrew Speechly, Adam Gilligan (EPA).

Absent: Cr Hollee Jenkins

Agenda Item:

Acknowledgement of Country

1. Welcome and Introductions

Mr Tate welcomed attendees to the meeting.

2. Apologies

See above.

3. Minutes of Previous Meeting, No. 19 of 25 February 2016

The Committee adopted the minutes as a true and accurate record.

Mr Bennett summarised the requirements of the pollution reduction programs referred to in the minutes, in response to a request from Mr Krey.

Responding to a question from the Chair, Mr Bennett advised that the EPA and the OEH were investigating weather conditions in the Upper Hunter on days associated with high levels of PM₁₀ (particles less than or equal to 10 microns in diameter).

Ms Hyam reported that Singleton Council staff observed maintenance workers at the Singleton air quality monitoring station on 17 September 2015, a day when the monitor recorded a late-morning spike in PM₁₀ levels. No council mowing was scheduled that day. Ms Hyam noted that mowing may have occurred at Civic Park, 100 metres northwest of the Civic Centre.

4. Actions Arising from Previous Meetings

The EPA advised that six of the eight actions from the previous meeting were completed. Two outstanding actions would be addressed during the meeting.

5. Air Quality Report and Seasonal Analysis Summer 2015-2016

Mr Betts (OEH) presented the draft seasonal newsletter for summer 2015-2016, reporting on the Upper Hunter Air Quality Monitoring Network results and performance. Key points included:

- Air quality was generally good in the Upper Hunter from 1 December 2015 to 29 February 2016.
- Levels of PM_{2.5} (particles less than or equal to 2.5 microns in diameter), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂) were all below benchmark concentrations during summer 2015-2016 at all 14 air quality monitoring stations.
- PM₁₀ levels were good, with all days below the 50 µg/m³ benchmark at eight of the 14 sites.
- Levels of PM₁₀ were above the benchmark at the other sites on five days during summer 2015-2016. Compared with previous summers, this was four more days than summer 2014-2015, five fewer days than summer 2013-2014 and one less day than summer 2012-2013.
- Smaller community sites at Bulga, Maison Dieu, Warkworth and Wybong, and the diagnostic site at Singleton North West, experienced one day over the PM₁₀ benchmark. Camberwell recorded three days over the PM₁₀ benchmark.
- The highest daily PM₁₀ levels occurred on 11 December 2015, with 63.3 µg/m³ recorded at Maison Dieu and 52.9 µg/m³ at Camberwell. Fires were recorded west of Denman in the afternoon and overnight on 11 December 2015. Elevated PM₁₀ levels across the region were associated with strong northwesterly winds in the afternoon and evening. Peaks in hourly PM₁₀ levels coincided with winds turning southeast to easterly overnight.

Responding to Action 2 from the previous meeting, Mr Betts reported a low level of activity in summer 2015-2016 on the OEH's Internet web page dedicated to the Upper Hunter network. The number of page views was close to base line levels and showed no increase during the PM₁₀ event on 11 December 2015.

Responding to Action 4 from the previous meeting, Mr Betts noted that the newsletter included a section on particulate matter annual averages. Rolling annual averages, should not be compared to national average benchmarks which are based on calendar years. Mr Betts noted that the National Environment Protection (Ambient Air Quality) Measure was revised in February 2016, introducing an annual average standard of 25 µg/m³ for PM₁₀ and 8 µg/m³ for PM_{2.5}.

Mr Sharrock asked why Figure 8 of the newsletter, the PM₁₀ pollution wind rose, used a benchmark of 75 µg/m³, rather than 50 µg/m³, to describe PM₁₀ levels. Mr Betts explained that the wind rose used 1-hour average levels, rather than 24-hour average levels of PM₁₀. The OEH conventionally used 75 µg/m³ as benchmark to describe elevated 1-hour average PM₁₀ levels, in the absence of a national standard for 1-hour average PM₁₀ levels, to be distinguished from the national standard of 50 µg/m³ for 24-hour average PM₁₀ concentrations. Hourly concentrations above 75 µg/m³ provided a more reliable indicator of sustained elevated levels.

Mr Krey noted that the network monitored PM_{2.5} at three sites, Muswellbrook, Singleton and Aberdeen. Mr Krey asked if the EPA and the OEH planned to monitor PM_{2.5} more widely across the network.

Mr Bennett explained that the original design of the network focused on PM₁₀ levels, which varied over shorter distances than PM_{2.5} levels. The smaller PM_{2.5} particles stayed suspended longer than PM₁₀ particles, travelled further and became well mixed in the air. Therefore, PM_{2.5} monitoring was considered to require a less dense network of monitors. More recently, the Upper Hunter Valley Particle Characterisation Study provided new evidence that local particle sources, such as wood heaters, contributed to elevated PM_{2.5} levels in winter. In response, the EPA was working with local councils and communities to reduce wood smoke in the Upper Hunter. If wood heaters were used widely in small communities, then the most appropriate action for governments was to promote more efficient wood heating. Mr Krey thanked Mr Bennett and advised that he could not accept the EPA's reasoning as an adequate explanation to justify why small communities could not have PM_{2.5} monitors. Mr Bennett advised that the EPA was required by legislation to review the effectiveness of the network in 2017. As part of the review, the EPA would offer the Committee the opportunity to advise on changes to the network. The EPA would consider the need and cost effectiveness of any recommendations for improvement.

Mr Tate commended the OEH for the draft Upper Hunter air quality newsletter for summer 2015-2016 and thanked Mr Betts for his presentation and his consideration of the Committee's requests.

6. Lower Hunter Particle Characterisation Study and Dust Deposition Study

Mr Betts briefed the Committee on the findings of the Lower Hunter Particle Characterisation Study, a collaborative research project commissioned by the EPA and undertaken by the OEH, CSIRO, ANSTO (the Australian Nuclear Science and Technology Organisation) and NSW Health from 2013 to 2015. The EPA and OEH published the reports and presented the findings at a community briefing, held in Newcastle on 27 April 2016.

The study investigated the chemical components of airborne particles referred to as PM_{2.5} and PM_{2.5-10} (particles with diameters larger than 2.5 µg and less than 10 µg). Mr Betts noted that these particles, invisible to the human eye, were dozens of times smaller than the width of a human hair. They were associated with respiratory and cardio vascular disease because they could travel deep into the lungs and enter the blood stream. The impacts of PM_{2.5} levels were of most concern worldwide, compared to other particle sizes.

Levels of PM_{2.5} and PM₁₀ in the Lower Hunter were good by world standards and similar to levels in Sydney. Levels above the national standard occurred at Stockton at times, during onshore winds.

The Lower Hunter study applied the methods used in the Upper Hunter Valley Particle Characterisation Study, which focussed on PM_{2.5} particles in 2012 to 2013. Mr Betts noted that the most outstanding finding in the Upper Hunter study was the high level of wood smoke in PM_{2.5} particles, especially at Muswellbrook in winter.

High ammonium nitrate levels in PM_{2.5} particles at Stockton, especially in winter, are likely to have come from a local industry. The study also found high levels of fresh sea salt, and older sea salt chemically combined with particles from industry and vehicles, in PM_{2.5} and PM_{2.5-10} particle at the four monitoring sites, Newcastle, Stockton, Mayfield and Beresfield.

PM_{2.5} particle levels and composition were similar at Newcastle, Mayfield and Beresfield, with about 50% of particles from industry, vehicles, shipping and wood smoke, and about 50% from natural sources, such as sea salt and soil. Sea salt contributed more particles in summer months due to the more frequent sea breezes. Wood smoke contributed more particles in winter. Stockton received about 65% of PM_{2.5} particles from industrial sources and 35% from natural sources.

Levels of PM_{2.5-10} particles were two and half times higher at Stockton, due to higher levels of fresh sea salt, compared to Mayfield, the other site that sampled particles of this size. The high levels of fresh sea salt in onshore winds at Stockton most likely accounted for the site's recording the highest PM₁₀ levels in the OEH monitoring network. The Stockton monitor is located a few hundred metres from the surf zone.

The investigation method could not separate coal particles from other types of carbon particles detected. The researchers estimated that coal could contribute up to 4% of PM_{2.5} particles at all sites and up to 10 % of the PM_{2.5-10} particles. Other sources of carbon particles included soot from the combustion of fossil fuels in industry and vehicles.

Mr Sharrock noted that he and other Committee members attended the community briefing on the study, held in Newcastle on the previous evening, and that the speakers were articulate and answered many questions from the audience.

Mr Krey asked how the effects of PM_{2.5} particles composed of sea salt compared with effects of particles from other sources.

Dr Dalton advised that the Centre for Air Quality and Health Research and Evaluation (CAR) published a review, in December 2015, on the health impacts of emission sources and levels of particulate matter in NSW. The review found that published studies were more concerned for the impacts of particles from combustion sources, rather than sea salt or particles from other sources. Dr Dalton described the first 16 pages of the report as recommended reading. He noted that research studies were more likely to be published when they found evidence for a problem rather than insufficient evidence.

Action 1. The EPA to circulate to Committee members an extract from a report on the health impacts of emission sources and levels of particulate matter in NSW, published by the Centre for Air Quality and Health Research and Evaluation, in December 2015.

Mr Bennett outlined that the EPA was working collaboratively with Orica to reduce PM_{2.5} emissions from the prill tower which manufactured ammonium nitrate on Kooragang Island. The EPA was working with relevant operators to reduce particles emitted at all points in the Hunter Valley's chain of coal operations, including mine extraction, loading to rail, unloading and stockpiling at the port and loading onto vessels.

Mr Bennett noted that Newcastle's PM_{2.5} annual average concentrations of 6 to 8 µg/m³ were lower than levels in other industrial cities and compared well with levels of 4 to 6 µg/m³ measured at Cape Grim on the north coast of Tasmania.

Mr Tate agreed that the community briefing was a success, with over 100 people attending. The comments and questions raised by the community were positive and he praised the quality of the presentations. Mr Tate commended the EPA's efforts to build the community confidence that was evident among the audience at the public meeting.

Dr Dalton advised that videos of the community briefing were available on the Newcastle Herald website.

Mr Tate thanked Mr Betts for his presentation on the particle characterisation study.

The EPA briefed the Committee on the Lower Hunter Dust Deposition Study which investigated the composition of visible black dust found on household surfaces, such as window sills and the tops of electricity meter boxes.

The study's Reference Group included representatives of the local community and industries and independent technical experts. The group steered the study's design and set the research questions. The EPA commissioned the environmental consultancy AECOM Australia, after a competitive tender process, in consultation with the group.

The group designed a community flyer to recruit residents willing to host dust deposition gauges during the 12 month sampling period. The researchers also collected dust samples using Petri dishes and brush samples. Sampling sites were selected close to the rail corridor, downwind of coal stockpiles and in areas identified in complaints to the EPA Environment Line.

The most outstanding finding was that the black dust samples contained mostly soil or rock dust, which comprised, on average, 69% of the deposited dust. Coal particles contributed an average of 10%, rubber 4%, soot 3% and the remaining 15% contained salt, ash, plant and insect debris, alumina and paint.

The dust deposition rates ranged from 0.5 to 1.1 grams per square metre per month (g/m²/month) and were below the EPA's annual criterion of 4 g/m²/month.

In discussion, Ms Hyam suggested that a dust deposition study in the Upper Hunter could alleviate community concerns about dust and 'liveability' in communities living near mines. Other committee members noted community concern about dust in drinking water.

The Committee supported Ms Hyam's suggestion for a dust deposition study in the Upper Hunter. Mr Tate asked the EPA about the likelihood of its undertaking a similar study in the Upper Hunter.

Mr Bennett advised that he would take the Committee's request to the EPA. He emphasised that while a dust deposition study could determine the composition of the dust on roof tops it could not deliver certainty about the safety of drinking water from roof run-off.

Mr Tate proposed a recommendation to the EPA for an Upper Hunter dust deposition study and for a briefing from the EPA to discuss how a study might proceed and how the Committee might be involved. The Committee supported the recommendations.

Recommendation 1. The Committee recommended that the EPA commission an Upper Hunter dust deposition study in collaboration with the Committee.

Recommendation 2. The Committee recommended that the EPA address the Committee at the next meeting in response to Recommendation 1.

Mr Tate thanked the EPA for the presentation and thanked the Committee for its contribution.

7. EPA update on Dust Stop program and optimising mine operated air quality monitoring

Mr Bennett recapped the background to the EPA Dust Stop program which aimed to minimise coal mine dust emissions in the Upper Hunter.

In 2010 EPA commissioned Katestone Environmental Pty Ltd to investigate international best practice dust control. Their report determined that while NSW employed many best practice measures there was scope for improvement. Wheel generated dust, overburden handling and wind erosion were the main sources. Reducing these formed the basis for the EPA's Dust Stop program.

The Dust Stop program required Hunter Valley coal mines to undertake a series of pollution reduction programs (PRPs) to reduce fugitive dust emissions from mining activity.

- PRP 1 required mines to achieve 80% control of wheel generated dust
- PRP 2 required mines to modify operations in weather conditions most likely to increase dust
- PRP 3 required mines to investigate dust reduction when handling overburden, the rock material overlying the coal seams
- PRP 4 required mines to estimate their surface areas exposed to wind erosion.

Mr Bennett provided an overview of PRP 4 and a progress report on the mines' assessment of areas exposed to wind erosion.

PRP 4 defined land exposed to wind erosion as land that had been disturbed by mining and not stabilised after mining. Stabilised land was defined as land with more than 50% groundcover, or land that passed the USEPA test method, known as Rule 403.

PRP 4 required the mines to compare the calculated areas of wind exposed land with the predicted areas of wind exposed land, stated in the mines' Environmental Assessments, prepared before mining commenced.

Reports from the mines, to date, showed that the current area of wind-exposed land was 9,000 Ha, being the difference between 17,000 Ha of disturbed land and 8,000 Ha of stabilised land. The estimate of 9,000 Ha currently exposed to wind erosion was less than the 11,000 Ha of wind-exposed land predicted in the Environmental Assessments.

Comparing the performance of the 16 mines in the analysis: seven mines had less land exposed to wind erosion than predicted, regardless of the area stabilised; four mines had less land exposed than predicted, due to the area stabilised; and five mines had more land exposed to wind than predicted.

The EPA was negotiating PRPs with the relevant mines to reduce wind exposed land area to the levels predicted in their Environmental Assessments. Methods available to stabilise exposed land include hydro-mulching and aerial seeding. Mr Bennett noted that the Department of Planning and Environment (DPE) regulates the rehabilitation of exposed land.

Ms Hyam asked whether the estimated tripling of exposed land area in the Upper Hunter would triple the dust source.

Mr Bennett explained that the EPA did not have the legal power to influence the amount of land exposed by the mines' operations. The EPA would use its legal powers to close the gap in cases where the amount of wind exposed land was greater than the area predicted in the Environmental Assessment. The EPA also used covert surveillance and site inspections to observe the dust generated by stabilised areas, especially in adverse weather.

The Committee members reported observing different amounts of fugitive dust from adjacent mines near Bulga and Muswellbrook.

Mr Harrison advised that the DPE worked with the Division of Resources and Energy (DRE) to incorporate rehabilitation planning into Mining Operation Plans. These bodies are working together to target mines that significantly operated outside of their plans.

Mr Krey noted that although the mine's original Environmental Assessment predicted an area of exposed land, the mine could modify its Mining Operation Plans to change the area to be rehabilitated. Mr Bennett recapped that the EPA used the Environmental Assessment as a benchmark for its regulation of dust from mines.

Mr Harrison confirmed that the DPE approved modifications to Mining Operation Plans on a regular basis. The DPE applied a degree of flexibility in approving subsequent changes to Mining Operations Plan, compared to the predictions of the original Environmental Assessment.

Mr Bennett recapped the background to the EPA's plans for mine site air quality monitoring optimisation.

In negotiating the industry-funded Upper Hunter Air Quality Monitoring Network (UHAQMN), the EPA and the DPE committed to reviewing their existing requirements for air quality monitoring by the mines.

The aim of the EPA's plans for mine monitoring optimisation was to move monitors away from the receivers and nearer to mines to monitor emissions from mining activity.

The EPA also would negotiate with the mines to replace older monitoring instruments with continuous PM₁₀ monitors, aligned with the dominant wind direction. This approach would allow quantification of the mine's individual contributions to PM₁₀ levels.



The EPA has issued draft license variation notices to all mines, proposing changes to the monitoring conditions on their environment protection licences, to require only upwind and downwind PM₁₀ monitoring, to commence before spring.

The EPA received feedback from some licensees regarding the lack of consistency between the monitoring requirements of the EPA and DPE. Mr Bennett advised that the EPA received in-principle support from the DPE for a trial of the upwind-downwind monitoring approach

Mr Harrison acknowledged community concern about the removal of monitors from sensitive receiver locations such as residential properties. Mr Krey agreed that communities were not happy with existing mine monitors being removed.

Mr Bennett reiterated that the industry-funded UHAQMN provided 14 monitors at receiver locations. The proposed changes to mine-operated monitoring removed the duplication of monitoring at receiver locations. Changing the focus to measuring the incremental contribution to PM₁₀ levels from each mine provided a guide for regulatory action by the EPA and required mines to be more accountable for their contribution to the cumulative impact of air quality in the Upper Hunter.

The EPA finalised the licence variations with mines at Bulga and Mangoola.

Mr Bennett reminded the Committee that some mines faced challenges establishing upwind-downwind monitoring due to individual site conditions such as steep terrain or a lack of power supply. The EPA would discuss the proposed changes with the mines' community consultative committees and find solutions to individual site issues, such as solar powered monitors.

The Committee discussed preferred methods of public access to monitoring data. Some committee member agreed that many community members remained unaware of any air quality monitoring results. Mr Krey advised that the community would like to know monthly averages and maximum and minimum levels in addition to a continuous stream of real time readings.

Mr Watson advised that the mines reported daily averages in their annual reviews and continuous monitoring data, including monthly values on their websites.

Mr Tate thanked Mr Bennett for his presentation and reminded the Committee members of their ability to raise awareness among their contact networks.

8. Community Feedback

Mr Tate invited the Committee to share feedback from their contact networks. He noted that the Committee had worked collaboratively to refine the format and key messages in the seasonal air quality newsletters and the associated media releases. The next newsletter would provide a clearer message on air quality trends.

Dr Dalton asked the Committee members about the nature and frequency of their interactions with their contact networks.

Mr Krey reported to the monthly meetings of the Bulga-Milbrodale Progress Association which was attended by up to 20% of the local population. His email contact list included about 100 contacts. He met with community members weekly in informal settings. He posted hardcopies of the Upper Hunter air quality seasonal newsletters on a community noticeboard.

Mr Krey asked whether the front page of the seasonal newsletters, in future editions, could provide clear messages for the community about the long term trends in particle levels. In response, Mr Betts displayed examples of two graphs, presented at the previous meeting, which showed trends in annual averages of PM₁₀ and PM_{2.5} for 2011 to 2015. The Committee supported the recommendation to include similar graphs on the front page in future editions of the newsletters.

Action 2. The OEHL to show long term trends in PM₁₀ and PM_{2.5}, on the front page of future editions of the Upper Hunter air quality seasonal newsletters.

EPA reminded the Committee that feedback from the Committee's survey in October 2015 recommended improving communication with the wider community. The EPA encouraged the Committee members to consider this agenda item as an opportunity to report on the details of their community interactions since the previous meeting, including any feedback.

Ms Hyam and Dr Chicken attended the half-day workshop on reducing diesel locomotive emissions held by the EPA in Sydney on 10 March 2016. The workshop reported on an EPA project to test an emissions reduction upgrade kit for diesel locomotives. The kit delivered reductions in emissions and noise levels and an increase in fuel consumption.

The Committee requested a briefing on the EPA's actions to reduce emissions.

Action 3. The EPA to address the Committee on actions to reduce emissions from diesel locomotives.

9. General Business

Mayor Bedggood asked whether any modelling of cumulative impact assessment incorporated dust emissions from exposed surfaces.

Mr Bennett explained that the DPE required mining proposals to include the modelling of cumulative impacts of surrounding mines for the environmental assessment process. This modelling is usually prepared by a consultant. He recapped that the EPA and OEHL were collaborating to model the total dust load in the Upper Hunter in adverse weather conditions. One of the challenges was collecting reliable information on the staging of mining operations.

Mr Krey reported community mistrust in the reliability of modelling by consultants engaged by the mining proponent.

Mr Bennett suggested that the Committee consider the modelling of the air quality impacts of mining as an item on the agenda for the next meeting.

Dr Dalton noted that Professor Richard Bush at the International Centre for Balanced Land Use at the University of Newcastle was interested in the cumulative impacts of development in the Hunter.



Dr Dalton recommended that Professor Bush address a meeting of the Committee to speak about the issues. The Committee supported Dr Dalton's recommendation.

Recommendation 3. The Committee recommended that the EPA invite Professor Richard Bush of the International Centre for Balanced Land Use, at the University of Newcastle, to address a meeting the Committee to speak about the cumulative impacts of development in the Hunter.

Mr Tate thanked the Committee, the OEHL and the EPA for their participation and contributions.

Meeting closed at 1.30 pm

Next meeting date: 28 July 2016. Minutes for review by: John Tate (Chair).