



RESEARCH GROUP – REVIEW OF FINAL VERSION OF WESTERN SYDNEY AIRPORT EIS

Gap Analysis Review of the Environmental Impact Statement for Western Sydney Airport

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Introduction

This is a review of the final version of the Western Sydney Airport (WSA) Environmental Impact Statement (EIS). It is primarily concerned with Volume 5 of the EIS Submission report but also covers some points in Volumes 1, 2A, 2B, 3, 4 and revised Draft Airport Plan.

Gap Analysis

The following important points were noted on each topic in the final version of the EIS. These points were not adequately addressed in the final version:

1. The EIS Document is invalid

The EIS does not contain the information that it was required to provide under the Issued Guidelines for the Content of a Draft Environmental Impact Statement for Western Sydney Airport issued to the Department of Infrastructure and Regional Development in January 2015.

The New South Wales Government agrees that the EIS lacks the appropriate level of detail. Their submission states; *“The draft EIS indicates that the conceptual airspace design may not have been developed to a level of detail necessary for implementation. Furthermore, it is based primarily on air space requirements rather than on the basis of safety, efficiency, noise and environmental considerations, as well as minimising changes to existing regional airspace arrangements.”* (New South Wales Government, 2015) For example the following points were required under the guidelines but were not included in the EIS:

- The impacts did not cover all of the phases of planning, construction, operation and decommissioning of the airport, i.e. the whole of the life cycle of the airport.
- Assessments did not provide a detailed assessment and analysis of the nature and extent of both short-term and long-term impacts; the uncertainty in the assessment as well as the technical methodology; assumptions and other information needed to make a detailed assessment. The EIS focused only on Stage 1 and ignored the more substantial impacts of Stage 2.
- Impacts that added to existing impacts were not assessed as to how the impact is increased cumulatively. Areas where this is important include; health impacts from air and noise pollution including mental health, learning and educational impacts from noise pollution and sleep disturbances, including the mental health of children.
- The social and economic assessments in the EIS did not provide a balanced discussion, with disproportionate emphasis on economic benefits over its social impacts.
- Risks or hazards created by the airport to people or property were not quantitatively assessed. Many impacts were not identified or assessed. Impacts that were quantified did not use appropriate world-leading best practice guidelines. Examples of this are; the economic costs of health impacts from pollution and noise, the costs of reparation for building insulation and impact on critical infrastructure. Lack of proper assessment can primarily be blamed on the use of indicative flight paths rather than proper modelling of final flight paths.
- The indicative flight paths shown in the EIS are a proof of concept. They were designed only to show that it is possible to safely separate the airspace between KSA and WSA. They were not based on minimizing health risks to residents, minimizing terrorism

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threats, minimizing fuel consumption or any other criteria. Quantitative assessment of impacts cannot and should not be implied from a proof of concept model. It has to be applied to the real case that is to be used in order to provide the correct assumptions to model the impacts in areas such as noise exposure, pollution exposure, risks of plane crashes and impacts to critical infrastructure.

- The 1997 EIS provided more information that enabled the assumptions and modelling to be independently tested. There is insufficient information about the modelling processes and assumptions to enable independent informed criticism of the validity of conclusions presented in the final EIS.
- Limitations in the draft EIS which were not rectified in the final EIS are noted below:
 - No final detailed flight paths or noise impacts;

“SACF believes that, as a basis for environmental assessment and communication and consultation with the community, detailed proposed flight paths and accurate predictions of associated noise impacts should have been released as part of the EIS. By far the most significant environmental impact of an airport is the aircraft noise created by the aircraft flying on the flight paths to and from the airport. SACF holds concerns regarding the integrity of a full environmental impact assessment if the analysis of the proposed flight paths has only progressed to the broad conceptual stage. A detailed analysis of flight paths is essential for the EIS to meet its fundamental legislative requirements. This must be improved so the community can have confidence in the flight paths and the effects of these flight paths can be measured with accuracy.” (Sydney Airport Community Forum, 2015)
 - Lack of alternatives of airport layouts;

“...in other words there has been no consideration of alternative runway orientations – a key determining factor of flight paths. This contrasts with the EIS undertaken in the late 1990s which examines multiple layouts and runway alignments, and gives little visibility of whether the chosen layout, and in particular the runway alignments, achieve the best environmental outcome. Given the time that has lapsed since the previous EIS we would have expected to see a thorough current option-evaluation process to explore alternatives.” (Parsons Brinckerhoff, 2015)

2. Social Equity in Sydney

a. Restrictions on Sydney Airport operations

A raft of legislated restrictions on airport operations such as; a daily curfew, an hourly movement cap and noise sharing targets protect the health and amenity of residents living near Sydney Kingsford Smith Airport (KSA). According to Air Services Australia: *“Sydney Airport has a curfew that restricts both aircraft type and runway usage between the hours of 11.00pm and 6.00am.”* (Airservices Australia, 2012) In addition, Sydney Kingsford Smith Airport has a movement cap of maximum 80 aircraft movements per hour and cannot be exceeded. (Airservices Australia, 2010) Sydney Kingsford Smith Airport also uses a STAR system rather than a point merge system to share the noise pollution equitably across Sydney suburbs.

b. Denial of Social Equity for Western Sydney residents

Unlike Sydney Kingsford Smith Airport, Western Sydney Airport will operate on a 24 hour basis. According to the EIS: *“Although the airport is proposed to operate on a 24-hour curfew free basis, there is predicted to be relatively few aircraft movements occurring during the night-time period, particularly for the Stage 1 development. Indicative aircraft movements per hour are presented on Figure 7–11.”* (Department of Infrastructure and Regional Development, 2015) This statement is misleading.

According to the EIS *Figure 7–11 – Aircraft movements per hour* there is a approximately 38 aircraft per hour at 11pm (a plane every minute and a half), 20 aircraft per hour at midnight (a plane every 3 minutes), and 15 aircraft per hour at 1am (a plane every 4 minutes), then averaging 5 aircraft per hour till 5.30 am when it then rises sharply to 75 aircraft per hour. A plane every minute is not *“relatively few aircraft”*. It is more aircraft than any inner Sydney suburbs experience near Sydney Kingsford Smith Airport during the daylight hours let alone during the night.

Unlike residents in close proximity to Sydney Kingsford Smith Airport, children living in Western Sydney and the Blue Mountains will be forced to live with frequent all-night aircraft noise as a result of the proposed Western Sydney Airport. This is an unequitable proposition that will interrupt sleep and cause sleep deprivation. Residents living near Sydney Airport are protected by a curfew protecting their right to undisturbed sleep. The curfew safeguards impacts to their health, wellbeing and general quality of life.

Western Sydney Airport operating without a curfew means that the health and wellbeing of families living in Western Sydney will be adversely impacted. They are denied the same social equity as inner Sydney families.

The Commonwealth Government’s decision for a no curfew airport was based on economic reasons. *“In making a decision about the regulatory controls on any airport, the Government will need to make judgments about the economic value of less restrictive hours of operation and the impact on communities.”* (Australian Government, 2015) In order to justify this decision, the negative impacts to the quality of life for families in Western Sydney has been downplayed, ignored or denied. Long term health and wellbeing issues including disturbed sleep, chronic tiredness, increased stress levels, potential increase in domestic violence, impact on children’s learning and children’s ability to reach their full potential are some of the serious ramifications that have not been acknowledged in the EIS.

The Commonwealth Government promotes Western Sydney Airport as a ‘Greenfield’ development, however according to the NSW Department of Planning the population of Western Sydney will grow to almost 3 million people by 2031. *“The population of Western Sydney will grow by almost 1 million people (or 46%) over the next 20 years. The region will continue to grow faster than Sydney as a whole; by 2031, Western Sydney will be home to 50% of the capital city’s population, up from 47% in 2011.”* (NSW Department of Planning and Environment, 2014) Large residential subdivisions are planned in areas surrounding the proposed airport. This clearly indicates that a no curfew airport will impact large numbers of Western Sydney residents.

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The Australian Government should advocate social equity for all Australians regardless of their geographical location or socio-economic status. Protecting the rights of inner Sydney families while denying the same rights for families in the Western Suburbs denotes a blatant intent to deny equal rights to those with lower social economic status and therefore less political influence.

3. Employment

a. Projected employment numbers

It is important to note that WSA creates no extra employment opportunities for Western Sydney: it redistributes them from other parts of NSW (Ernst & Young, 2015, p. 9). This means WSA will create no new jobs for Western Sydney but move existing jobs from Sydney Airport and other parts of NSW to Badgerys Creek.

The NSW Government’s submission stated *“the total on-site employment at the airport is expected to be approximately 13,000 in 2031 and approximately 90,000 in 2063”* but acknowledged that these jobs are not ‘net new’ jobs: *“The draft EIS modelling assumes that these are not ‘net new’ jobs but a distribution of jobs from elsewhere in the system (NSW, in this case). It is likely that some of these jobs would be redistributed from around the KSA area but also from other centres in Sydney. Increases in job numbers above the base case scenario are expected to occur in the Western Sydney LGAs of Penrith, Blue Mountains and Wollondilly.”* ((New South Wales Government, 2015)

Investigations into previous studies of employment at WSA show there is a large range in estimation of job numbers between different reports of Western Sydney Airport. The NSW Government submission states; *“The draft WSA EIS predicts significantly more employment associated with the airport environs than anticipated in earlier studies. This is partially explained by the inclusion of non-airport specific jobs within a substantial business park.”* ((New South Wales Government, 2015)

According to The Bureau of Infrastructure, Transport and Regional Economics (BITRE, 2013) *“The lack of independence (in reports commissioned by airports or the Australian Airports Association) raises concerns that studies may over-state the “benefits” of the airport-related activity (measured in jobs, Gross State Product, et cetera).”* ((Bureau of Infrastructure, Transport and Regional Economics, 2013)

Employment at an airport is closely related to the demand from the number of passengers travelling. However, the ratio of full time equivalent (FTE) jobs per million annual passengers (MAP) varies widely between airports in Australia. According to the Bureau of Infrastructure, Transport and Regional Economics (BITRE) the average across the ten selected major Australian airport sites was about 580 people directly employed at airports in 2011 for every million annual revenue passengers.

The government calculates projected direct job numbers for WSA in the draft EIS by a ratio of 750 airport employees per million annual passengers (MAP). With a forecast of 10 MAP in 2031 in the draft EIS, this ratio creates 7,500 FTE jobs. It is unclear what

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makes up the 1,230 FTE shortfall between the 7,500 FTE created using this ratio and 8,730 FTE jobs stated in the draft EIS.

The ratio of 750 jobs per MAP for WSA is higher than the ratio of 731 jobs per MAP at Sydney Kingsford Smith Airport (KSA). Considering this is a secondary airport in Sydney, the ratio of 750 jobs per MAP appears very optimistic. London’s second airport Gatwick has passenger numbers of 41 MAP and 21,000 FTE jobs onsite, creating a ratio of 512 FTE per MAP. It would be more realistic to use the Australian average of 580 jobs per MAP (BITRE) to recalculate the direct number of airport employees as 5,800 FTE in 2031 at Stage 1.

By relocating services from KSA to WSA, it is likely to cause a significant loss in employee numbers. This is due to cost-saving measures, modernisation and restructure when industry relocates. WSA is a new build airport and will use the latest in airport automation, computerisation and cost-saving measures (automated baggage handling, self-service kiosks, self baggage drop, security biometric scanning, electronic ticketing, outsourcing employment, remote operations, self-driving vehicles etc). Automation, computerisation and cost-saving measures are likely to result in lower than projected job numbers in the EIS.

A 2015 report by the Committee for Economic Development of Australia (CEDA) shows that “40 per cent of jobs in Australia have a high probability of being susceptible to computerisation and automation in the next 10 to 15 years”. ((Committee for Economic Development of Australia, 2015)) There is currently increasing automation in the mining industry, replacing human operators on drills, trucks, loaders and trains with autonomous vehicles operated in a remote location by computer. According to CEDA, in the next decade mines will operate with one third of their current workforce. The same levels of automation are predicted in industries that feature routine operations like cargo handling at airports.

Another consideration of the projected employment numbers is the type of jobs available at WSA. It is unclear what percentage of these roles will be fulltime, part-time or casual. Current Airport employment trends show increase in contracting or casual roles and decrease of fulltime roles. Sydney Airport for example has only a tiny fraction of their staff in fulltime employment. According to Sydney Airport Corporation; “*The airport provides employment for approximately 29,000 people across 800 businesses, of which we employed 379 people directly in 2015*”. ((Sydney Airport Corporation, 2016))

Another example underemployment at airports is Qantas. Qantas has been locked in disputes with the Transport Workers Union (TWU) for over 9 months on a new enterprise bargaining agreement covering more than 1500 of its ground staff who are demanding more full-time work and longer hours. According to Mitchell Bingemann reporter for The Australian; “*Of the 1540 employees with Qantas Ground Services, only 12 staff are employed full-time. Some 219 are employed as casuals and the remaining 1309 are part-time workers. Under current conditions, Qantas part-time employees are guaranteed 20 hours of work a week. Any additional hours are paid at ordinary — and not overtime — rates for up to a total of 38 hours a week.*” ((Bingemann, 2016))

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Another factor to consider in the employment modelling is the slowing of employment numbers at Australian and International airports. About 200 additional jobs were added at the Sydney Airport site between 2006 and 2011, which represents only a 1% increase over the five-year period. This differs from the larger growth in revenue passenger movements at KSA, which rose from 30.0 to 35.6 million between 2006 and 2011, representing a 19 per cent increase over the five years. It is also much lower than the total employment increase in the Sydney SD of 8% in the same period. *“Despite a 19% increase in passenger numbers at Sydney Airport 2006 - 2011, employment at the airport site rose by just over 1%, whilst total employment in the Sydney SD grew by 8%.”* (Bureau of Infrastructure, Transport and Regional Economics, 2013)

Employment at European airports is currently decreasing; it has declined in a compound annual rate of 2.7% p.a since 2008. (Steer Davies Gleave, Oct, 2015)

Considering slowing employment numbers, underemployment trends, modernisation and cost-saving measures, the modelling of jobs at WSA is very optimistic and the actual job numbers are likely to be substantially lower than projected in the EIS.

b. Local job opportunities

Concerns were raised in the submissions about how to ensure local job opportunities and provide more work opportunities closer to home. The response in the EIS was to generate direct and indirect jobs and use mitigation measures to maximise local job opportunities such as Employment targets developed within Sustainability Plan. However, mitigation measures cannot guarantee local job opportunities:

- Contracts for Construction of the proposed airport could go to interstate and/or international contractors who supply their own team of workers.
- Redistribution of economic activity would mean competition from people where jobs have been lost from their location so they will be forced to seek employment in other locations including the proposed airport.

c. Impacts to agriculture and agricultural related employment

Submitters, including residents and local councils *‘expressed concern over the proposed airport’s potential impacts on agriculture in the local area, particularly the potential loss of employment from the relocation of agricultural related industries and the Sydney’s region access to fresh food’.* (WSA EIS Vol 5 Submissions Report, 2016, p. 330)The EIS Response recognised cattle and agriculture but failed to acknowledge the market gardens that have been part of Badgerys Creek site and surrounding areas for generations. Part of the Badgerys Creek site was leased to market gardeners and the produce was sold to local and Sydney Markets. This loss of local, less expensive fresh produce will have negative impacts both financially and on health of the local population who frequently purchase fresh produce from local farm stalls.

The EIS response failed to acknowledge the loss of employment in the agricultural sector and related industries. It also failed to acknowledge the social and economic impact to

those currently employed in the agricultural industries and the potential need to relocate their families to alternative areas offering similar work.

4. Economic impact

a. Economic viability of WSA

Submissions from the Aviation Industry raised concerns about the economic viability of WSA. The financial viability was not considered in the EIS

A study by Deutsche Bank in 2015 has concluded that the WSA may require \$1billion in subsidies in order to make it viable during its first decade (www.smh.com.au, 2015).

The Government has considered imposing a travel surcharge to assist in funding the airport. However, this has been strongly opposed by the Tourism industry as well as Aviation industry in their submissions. They are concerned that any additional charges like this will reduce competitiveness and prefunding in this way unfairly defrays the cost over a user who may never derive benefit from the airport.

The EIS failed to consider the potential drain on the public purse through subsidies.

According to the 2009 National Aviation White Paper, the development of an integrated planning approach for the Sydney region does not support the construction of an airport at Badgerys Creek. The White paper (2009) concluded that Badgerys Creek is no longer an option, due to years of urban growth and spatial planning for future growth in the south-west region of Sydney. The best use of the government held land was deemed to be release for future residential development.

b. Lack of demand in Western Sydney

Western Sydney Airport is touted by politicians and in the EIS to; *‘serve the transport needs of the people of Western Sydney’*. However, only 11% of airline passengers flying out of Sydney currently reside in Western Sydney. The majority come from Inner Sydney, the Eastern suburbs and the North Shore (together equalling 59% of passenger origins) (Sydney Airport Corporation, 2006). Any need for air travel by the people of Western Sydney is therefore overestimated.

c. Rail link to the city

Concerns were raised in submissions about the lack of rail link to the airport. Submitters stated that a rail link is critical for meeting the objectives for the airport. It would enhance the economic and social benefits (improve access to urban centres and tourist attractions), improve the integration of the airport with the broader region, help to alleviate existing transport pressures and deliver more environmentally sustainable outcomes.

Travel times to the city by road off peak are at least 1 1/2 hours, during peak hour the journey can be up to 3 hours. Competition between the airports will mean that WSA will not be utilised by either passengers or passenger aircraft due to the inconvenience, and this will make it economically unviable.

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Whilst funding has been provided for a "Joint Scoping Study" for the rail connection, no funding exists for construction of a rail line. It is highly unlikely that it will be constructed in time of the airport opening. Currently, the fastest journey to the city from Blacktown is 40min (four stations closer to the city than St Marys), and from St Marys, 58 min. Add on connection from Badgerys Creek, and even with this suburban rail link in place, the WSA will not be able to compete with KSA in journey times.

Only 8% of airport users are within closer commuting times to WSA than to KSA (Outer west, Outer Southwest, Blacktown to Baulkham Hills) (Sydney Airport Ground Travel Plan, 2006). Demand from local people will therefore be low, further contributing to a lack of financial viability. Many of the new road connections will be toll roads, which will add further costs to passengers using WSA, and make the use of hire cars extremely slow and expensive.

d. Impact on property values

Concerns were raised by submitters that over flight noise may negatively impact property values, however these were dismissed in the EIS based on previous studies reviewing prices in Australian Capital cities that found no statistically significant between noise exposure and housing prices in Melbourne and Sydney. However, it was a significant factor in Brisbane and Adelaide. Badgerys Creek and the other affected areas are in no way comparable to either Sydney or Melbourne. The areas are currently extremely quiet, and are sought after for their peace and tranquillity (quiet). The assessment investigated impacts on low density, large lots like those at Badgerys Creek. There was no consideration of other suburbs and villages under proposed flight paths.

The final EIS has omitted previous findings reported in the draft EIS that aircraft noise negatively impacts property values. (e.g. property values of residences under Sydney’s 3rd Runway flight paths decreased once they were instigated, and this differential was maintained over time). The impacts of noise are highly subjective, and relative.

5. Air quality

a. Air quality in the Sydney basin

Air quality assessment is a key factor in the EIS with consequences on health, ecology, economical viability and more. According to NSW government's own estimates, the economic cost of hospitalisations due to air-pollution in Sydney is around \$5 billion AUD per year, with a higher degree of impacts in the West ((Department of Environment NSW Government, 2005)).

The EIS in its Cumulative Impact Assessment, Human Health, after consideration of the cumulative impacts of the proposed airport development in combination with increased non-airport related traffic on major roadways near the airport has identified health risks from air emissions in Stage 1 of the proposed airport operation. (WSA EIS; Vol2a, Chapter 27, Cumulative Impact Assessment, 27.3.3 Human Health. P603-604., 2016) *“While in general, the health risks of the Stage 1 development were low, some of the air pollutants*

emitted during the operation were determined to be at the upper bound or marginally above levels considered to be acceptable by national and international regulatory agencies. Further analyses indicated that the primary causes of the elevated levels of risk were emissions from motor vehicles operating on roads outside the airport site that were non-airport related i.e. background traffic related to increased urbanisation and development. The contributions of these non-airport related motor vehicle emissions varies according to the estimate year and by pollutant but in 2030 includes: 88 percent for carbon monoxide, 70 per cent for volatile organic compounds, 68 percent for nitrogen dioxide and between 90-92 percent for particulate matter.”

“The health risks identified for the Stage 1 development are all additional to the existing baseline level. In 2006, a Parliamentary Inquiry into the health impacts of air pollution in the Sydney Basin found that despite evidence that air pollution had improved over the last 30 years, these improvements were offset by Sydney’s growing population, particularly in the south-west and western areas of Sydney. Evidence provided by NSW Health at that time estimated that in Sydney, there was between 600 and 1,400 deaths per year due to the air pollution in the Sydney Basin. Additionally, a recent review of the Fuel Quality Act 2000 estimated that in Sydney, NO₂ was responsible for 330 deaths per year and an additional 336 and 371 hospital admissions in 2015.”

We note air pollutants at Stage 1 were “determined to be at the upper bound or marginally above levels considered to be acceptable by national and international regulatory agencies”. It would be questionable if the Government, having ascertained these facts and the serious negative ramifications to the health and wellbeing of the people of Western Sydney at Stage 1, with 10 million passengers, would intentionally ignore the greatly magnified health risks by 2063 of 82 million passengers and the cumulative impacts and the resulting health costs to both State and Federal Governments.

b. Climate change effect on air quality

Arguably the biggest gap in the EIS relating to air-quality is that, although the EIS makes assessment on climatological time-scales (20 years and above), it does not incorporate climate projections for the Sydney Basin in its methodology and conclusions. This is despite the fact that much of the science is readily available in peer reviewed publications, as well as on the NSW government's website ((NSW Government Adapt NSW), and despite being provided with this information in the form of a submission to the draft EIS. In doing that the EIS fails to answer the question of how sustainable would life be in the West at the time that the airport will operate. The response to relevant submissions to the draft EIS were answered in the final EIS with: *“The effects of climate change on local meteorology are unable to be accounted for in the current atmospheric dispersion modelling given the inherent uncertainties involved”*. This statement is laughable given that data to support such a simulation is available on the NSW government website and the fact that such simulations are being done on a regular basis in Australia and around the world.

Examples of relevant research are provided below. These suggest that the hidden cost to the taxpayer as a result of air-pollution in Sydney's west is likely to be substantially larger than assumed in the EIS.

Key examples of what we currently know about the future climate in the Sydney Basin:

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- (Fei et al, 2015) shows that the future climate of NSW will exhibit "*substantial increase in frequency and duration of temperature inversions*". This phenomenon is associated with elevated levels of air-pollution (ozone, smog, etc).
- (Argueso et al, 2015),(figure 5) shows that the future climate of Sydney will exhibit an increase in heat stress and that the bulk of this increase will occur in the West due to urbanization (i.e. local climate change due to the so called the urban heat island effect). (Clarke, Crombie, Head, van Kempen, & Stansfield, 2012)shows that the future climate of NSW will exhibit an increase in bushfire fuel-load.
- Predictions made at AdaptNSW (NSW Government Adapt NSW) show that the future climate of Sydney is likely to offer less frequent precipitation. Since precipitation is a key mechanism that moderates air-pollution in the Basin, this is likely to result in more air-pollution in the Basin and especially in the West.

6. Noise pollution

a. Health impacts

The EIS failed to consider the full spectrum of negative health and psychological impacts of noise from airport operations and over flight and the associated costs to the healthcare system. Noise pollution from road traffic aircraft has been linked to a multitude of negative health impacts. These include hypertension, heart disease, stroke, insomnia, depression, and anxiety disorders (Floud S. et al, 2013); ((Stansfield S, Crombie R, 2011)); (Hardoy et al, Jan, 2005, p. Vol40)(Hardoy et al, 2005, Jan, 40(Stansfeld S.et al, 2000). Noise pollution is associated with increased mortality due to cardiovascular and respiratory related events (Tobias A et al, 2015).

Negative impacts of noise pollution are accumulative, so those in close proximity to the airport, and also exposed to noise from increased traffic, airport ground operations, and over flights, will be at particularly high risk of negative health impacts (Elmenhorst E. M et al).

In children, aircraft noise is known to lead to cognitive impairment, reduced performance at school, and behavioural problems (Haines et al, 2001a). One study in Switzerland found that 22,500 hospitalisations, and 14,000 years of life lost (YLL), were a direct result of noise exposure (Vienneau et al, 2015). Research from Sweden has found an increase in risk for hypertension of up to 30% per 5dB increase in aircraft noise (Bluhm et al, 2001).

Submitters raised issues with the inequity to local residents with WSA operating over 24 hours compared to the curfew on KSA. Issues such as sleep deprivation and associated health risks were raised. The only response was to state that an airport at Badgerys Creek has always been intended to operate without a curfew. Curfew free airports provide economic benefits and increase passenger/tourist numbers. However they then contradict themselves later to state that removing the curfew at KSA would make little difference to capacity problems. The EIS failed to justify why one community deserved a curfew and the other didn't.

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Where exposure to noise is perceived to be “unfair”, (inequity) annoyance rates are correspondingly higher (Maris E et al, 2007). This makes negative impacts worse. The WSA proposal has many features of procedural unfairness and discrimination, when compared to the KSA. Night-time noise exposure in particular can lead to serious vascular, stress, and psychological health consequences. (Floud S. et al, 2013), (Bluhm et al, 2001), (Maschke et al, 2004))

The town of Luddenham that was established well before the airport site was purchased and contains a school and residences that will endure noise levels above World Health Organisation (WHO) guidelines in both the day and night. Residents of towns such as St Marys and Erskine Park will all experience over flight noises of 70-75dBa and over 70dBa in Greendale. Average night-time operations will result in an estimated 48,000 residents experiencing more than 5 night time events above 60dBa.

b. Assessment methodology

Concerns were raised about the assessment methodology used in the EIS to determine noise impacts. In particular, the inappropriate use of ANEC/ANEF noise contours was not addressed. ANEC/ANEF maps do not indicate the true impact of noise pollution and are inappropriate for determining overflight noise impacts.

The current low population level of residents living near the airport were used to determine the noise impacts, however the large projected future increase in population levels that were used to justify the construction of the airport were not included in the impact assessments.

The NSW Government in their submission states; *“The draft EIS provides information on noise across metrics but does not include criteria for assessing what is an acceptable level, or at what levels actions will be implemented to mitigate impacts to residential and non-residential places (such as schools).”*

The EIS admits that some noise events significantly exceed the WHO guidelines; EIS Vol2a chapter 10 reports LAmax events for B747 to be 60-70dB over Erskine Park, St Marys and Blacktown, and 60dB over the Blue Mountains. For an A320 expected LAmax values of 60dB are expected over Erskine Park, St Marys and Blacktown. SW arrivals are expected to produce LAmax of 60dB over a portion of the Blue Mountains National Park World heritage area. Flights to the SW would travel over Greendale, Silverdale, Werombi, Theresa Park and the Oaks. There are large residential developments happening in these areas. 60dB is twice as loud as the recommendations. 70dB is six times as loud as the WHO recommendations.

c. Economic impacts

Economic losses due to negative health impacts from aircraft noise were not considered in the WSA draft EIS. However, a German study of 1 million people estimated the health costs of Frankfurt airport to be €1.5 billion, with an excess of 23,400 cases of disease and 3,400 deaths as a result of the airport (Greiser EI, Glaeske G. (2913), 2013). A Swedish cost analysis of exposure to chronic noise of 55dB or more estimated €230 million in 2006

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(Bluhm et al, 2001). Any positive economic benefits of an airport are going to be significantly outweighed by associated economic losses due to the health impacts of noise pollution.

d. Impacts on World Heritage

Submissions raised concerns about unacceptable noise impacts on the nearby wilderness areas in particular the Greater Blue Mountains World Heritage Area (GBMWH) from overflight and the potential threat they may have on the park’s World Heritage Listing. Some submissions also suggested that we adopt the “flight free zone” rules used to protect the Grand Canyon National Park to protect the GBMWH.

The wilderness areas impacted by overflight from WSA include:

- Greater Blue Mountains World Heritage Area,
- Burratorang State Conservation Area,
- Bents Basin State Conservation Area,
- Kanangra-Boyd Wilderness,
- Nattai Wilderness,
- Wollemi Wilderness and
- Grose Wilderness

The Colong Foundation suggested in their submission that the natural quiet in these wilderness areas can be protected if they are regulated and subject to areas of “flight free” zones. They suggest that by adopting the rules and regulations brought into to protect the Grand Canyon in the US from intrusive overflight noise, the natural quiet in wilderness areas near WSA can also be protected, (National Park Service)

The response in the EIS dismissed these issues claiming that the airport operations would not directly impact GBMWH or its World Heritage values. The EIS dismissed potential noise impacts claiming that the altitude of most planes would be greater than 5,600 feet above sea level and most would be over 10,000 feet above sea level when passing over GBMWH. The EIS then claimed that at these altitudes the planes would be not visually disturbing and that noise levels would only infrequently exceed 55dBA. The EIS further states; *“Potential noise and amenity impacts would be considered in the development of final flight paths for the proposed airport subject to requirements for safe and efficient aircraft operations.”*

It is important to note that these calculations of noise levels and overflight are based on the preliminary airspace design and therefore are only supposition. Also, the elevation of the GBMWH ranges from 66ft at its lowest point at the Nepean River up to 3986 feet at Mt Werong making a huge variance in an overflight range of 5,600-10,00ft from sea level and huge variation in overflight noise level. If the altitude of flights of 5,600ft is so acceptable, why did the US Federal Aviation Authority set a minimum overflight altitude of 14,500ft in the Grand Canyon (Federal Aviation Administration) to increase the area where aircraft noise could be minimized?

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It is clear from the response in the EIS that the safety and efficiency of the aircraft operations is of higher value than protecting the natural quiet and other world heritage values of the GBMWSHA.

e. Tourism impacts

Submissions raised concerns over the impact of aircraft noise on tourism in the Blue Mountains. In the EIS section 26.5.2.1 vol2a, the writers claim that there are no guidelines for noise in wilderness areas. They then say that in Australia, assessments of new airports use the 70dBA Lmax and 60 dBA Lmax exposure levels to gauge impacts. This is clearly ludicrous (70dBA is equivalent to standing next to a freeway). They state that the noise levels in the Blue Mountains are largely outside this exposure level (which contradicts the EIS information provided above). *"In recognition of the natural amenity values of the GBMWSHA, the EIS identifies areas of the World Heritage property that are predicted to experience noise levels above 50dBA LAmax and 55dBA LAmax."* they claim that noise levels between 50 and 55dBA are equivalent to quiet conversation, which is contradicted by the majority of noise modelling sources (50dBA=conversation at home, 60dBA=conversation in a noisy restaurant). Still, it is a ludicrous comparison, since noise levels measured by the EIS in the Blue Mountains (Springwood) were 29dBA during the day, and 24dBA at night. So the noise level would be at least 4 times the background level.

Tourism is the third biggest income earner for the City of the Blue Mountains, and the majority of that tourism depends on relaxation and nature based activities (Greater Blue Mountains Natural Attractions Project, 2009). The tourism industry is also the fourth highest source of employment in the Blue Mountains, providing 1,774 jobs out of a total of 16,517, or 11% of jobs in the area (BMEE) (Blue Mountains Economic Enterprise (BMEE).(n.d.), 2013-2014).

Bushwalking was one of the most popular activities, being undertaken by 40.1% of overnight domestic visitors and 28.9% of day trip visitors. To *"escape noise and experience silence and peace in nature"* are amongst the most important reasons for people visiting outdoor recreation areas and participating in bushwalking (Driver et al., 1987) (Maris E et al, 2007), (Maschke et al, 2004).

Increases in aircraft noise in outdoor recreational areas leads to increased annoyance in visitors, not only with the aircraft noise itself, but with other perceived problems (Krog et al, 2010). Where noise interferes with the enjoyment of recreational and natural environments it has been found that the use of those environments decreases (Krog et al, 2010). According to a survey conducted in 2009, there are four core motivations for people visiting the Blue Mountains. These are "pamper", "rejuvenate", "discover" and "physical exploration" (Destination NSW, 2009).

7. Risks and Hazards

a. Risk assessment approach

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There are a number of major deficiencies in the approach to the assessment of hazards and threat in the EIS that has resulted in unreliable estimates of risk and the impact on the major population centres of Western Sydney.

The EIS fails:

- To compare on a risk and cost benefit basis of realistic alternative options to this airport. While some attempt has been made to look at existing small airports within the Sydney basin, there was no attempt to consider a Greenfield site outside the Sydney basin to a comparative assessment of risks and benefits. This includes the introduction of 4th or 5th generation HSR along the east coast that provides an alternative paradigm to an airport. A comparison of the risks and benefits are required both as an option without a new airport and with a new Greenfield airport outside the Sydney Basin, for example in the Marulan-Goulburn area.
- To characterise the societal risk to the populations in Western Sydney. The use of 2030 as a marker for risk assessments rather than even using the full capacity of one runway airport operation seriously underestimates all risks that impact on the population. This includes aircraft crashes, noise, pollution, bat strikes leading to aircraft crashes.
- To properly consider all known mechanisms of loss in the in the assessment of the consequences of the threat or hazard. The quantified risks are limited to estimates of crashes and do not include the death and economic losses that occur from either a direct crash or indirectly from infrastructure collapse.
- To address loss in terms other than fatalities where these potentially lead to catastrophic loss in economic and societal terms rather than loss of life, seriously underestimates the risk to society such that this development should not go ahead. There are a number of infrastructure facilities around this site in Western Sydney where the loss of some of those facilities could lead to societal losses up to or exceeding \$4 trillion, i.e. a significant proportion of the GDP for Australia and yet there is no assessment of the risk.

Hazard and risk in the EIS fails to consider whether the land use is actually a fit for purpose site. The size of these potential economic losses makes this site untenable.

b. Risk Assessment method

A Hazard and Risk Assessment required for any major new facility serves two purposes:

- To allay community concerns regarding the building of the facility by demonstrating that the community is not being subject to intolerable levels of risk.
- To comply with planning procedures which require a quantitative assessment of risk to demonstrate that the risk to the surrounding area is below the accepted criteria for the different land use (normally expressed in terms of fatalities per annum) and that the societal risk (the frequency of killing more than one person per accident) is within the accepted criteria.

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The guidelines issues for the EIS82 states the following aspects of the development need to be analysed including:

- Noise of Aircraft and Vibration on everyday activities,
- Changes to air quality during construction and operation (including seasonal and meteorological variation that impact local air quality,
- Bird and Bat Strikes,
- The creation of any risks or hazards to people or property that may be associated with any component from the construction or operation of the airport.

The need to analyse the creation of any risks by the operation of the airport requires an analysis of both individual risk and societal risk. (Kaplan, S. & Garrick, B. John, 1981)Kaplan and Garrick, define an acceptable level of individual risk as 10^{-4} per annum. They also state that individual risk is not an acceptable measure by itself without considering the number of people killed in an individual accident as society has an aversion to large number of people being killed by a single event. This is societal risk. They also show that the risk has to be summed over all scenarios that can kill multiple people to establish the true level of risk. Suffice it to say that if the level of societal risk exceeds the tolerable level of risk for society, then the venture should not proceed. The EIS analysis of risk has failed to demonstrate that building a Greenfields airport at Badgerys Creek does not exceed the tolerability of risk to society.

The precautionary approach that was used by R2A in the analysis assumes that the airport will be operational and does not assess whether the risk to the population is too large and hence should not be located at this site. It is clear that they have confused the assessment of risk with the assessment of adequacy of control of the risk. They are two different processes and the latter cannot be substituted for the former.

The assessment of risk should follow guidelines such as the (NSW HIP AP 4, 2011) and (Airport Watch Organisation, 1990), (UKHSE, 2016). The assessment has to demonstrate that the land is suitable both as an individual risk and as a societal risk. The assessment of risks and hazards has not undertaken this essential review of the risks associated with the airport. Instead they have only used the precautionary approach to risk control as outlined in publications by WorkCover NSW and SafeWork Australia.

While the High Court in various workplace judgments has relied on the magnitude of the risk, the probability of occurrence and severity of harm being balanced by the expense, difficulty and inconvenience caused and the utility of conduct (Green, 25082016), the concept of ‘so far as is reasonably practical’ also applies to the decision that the site is fit for purpose from a tolerable level of individual risk and societal risk.

Modern workplaces, apart from major hazards site, are unlikely to kill more than 5 people in any accident and even then they are likely to be within the boundaries of the business. Modern practice provides Public Safety Zones around major hazard facilities, which prohibit building to reduce exposure of people to risks that occur outside the major hazards facility to a tolerable level. The one exception to this is the building of a major

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airport because the risks extend over the airspace that occurs outside the boundaries and PSZ's around the runway approach and takeoff zones. There is significant societal risk outside of the PSZs prescribed in the EIS documents that has not been assessed.

Unlike workplace health and safety, individual and societal risk can be measured in economic loss, loss of amenity as well as death and injury.

Another aspect of risk control is whether undertaking a different course of action rather than building the airport can ameliorate intolerable risks. This requires a detailed cost comparison of the benefits and losses of the alternative courses of action compared with building an airport. The EIS papers do not provide such a cost and risk comparison of feasible alternative options, which it was obliged to undertake as part of the EIS (Guideline for a Draft Environmental Impact Statement for Western Sydney Airport, WSA-201--7391 p8 of 22 impacts to the environment, p5 of 22, Feasible alternatives., 2014).

High Speed Rail is an alternative for building this airport and there was no cost or risk comparison of the benefits and losses associated with adoption of this technology compared to building the airport even though it was briefly discussed. This includes comparison with building an airport outside the Sydney basin along a High Speed Rail Line. This option, not only has financial and economic benefits to NSW, Victoria and Queensland that were never discussed, it also nullifies the significant individual and societal risks that is caused by an airport at Badgerys Creek. This was a requirement in the Guidelines for the EIS but was not undertaken in a professional way.

As stated above, NSW Department of Planning and Environment has guidelines for planning and development, of hazardous industries in NSW (HIPAP 10: Land Use Safety Planning, 2011) and(UKHSE, 2016). Airports are considered hazardous as their operation can cause offsite risks to third parties that include death and injury to the population, destruction of property and loss of amenity. To demonstrate that a site is suitable, all individual and societal risks must fall below levels that are considered intolerable. If the individual exposure risk is larger than 10^{-4} per annum then the risk is intolerable.

78% of jet aircraft crashes occur during takeoff, climb to cruising height, decent, airport approach and landing (UKHSE, 2016). As a consequence people on the ground near the ends of the airport runways and outside the boundary are at a heightened risk of death and injury. The land use planning system must therefore impose controls that ensure the risk to people on the ground is within tolerable limits. The regulator can either impose conditions to reduce the risk to tolerable levels or if this cannot be achieved then reject the proposal. This type of control is usually in the form of Public Safety Zones around the airport to limit activity and hence the societal risk. In this EIS, PSZs are 1km in length around at either ends of the runway.

However the public safety zones cannot cover the impact area of air crashes around the site and sensitive areas such as schools, hospitals and shopping malls may produce societal

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risks that are intolerable. Where risk arises from impact on major Infrastructure, then that impact can have serious consequences that impact on the population, such as loss of electricity for months or loss of water supply for years as well as death. Hence the societal risk intolerance has to be measured in terms of economic loss, amenity loss as well as death and takes account of the aversion of society to accidents that result in multiple fatalities. This EIS has failed to consider these third party risks (Airport Watch Organisation, 1990).

The intolerable societal risk level is a function of the number of likely fatalities and typically the threshold of intolerance for 100 deaths is set about 10^{-4} . The threshold becomes lower as the number of fatalities increases. Consequently 100000 deaths would require a risk above 10^{-7} per annum for it to be an intolerable risk⁹⁴.

The Federal Government has 10 critical infrastructure sectors that are deemed susceptible to hostile acts and which require additional security measures. There are many such critical infrastructures within the area of operations of this airport. Aircraft movements pose an existential threat to these infrastructures and can cause significant impacts on the population of Western Sydney. Only a few were identified by R2A:

- Defence Establishment Orchard Hills approximately 12 km to the north.
- Warragamba Dam approximately 10km to the west.
- Prospect Dam approximately 14km to the northeast

The report undertaken by R2A does not consider other critical infrastructure considered as nationally important:

- Western Sydney Electrical Distribution Centre at Eastern Creek approximately 12km to the northeast
- Kemps Creek Electrical Distribution Centre approximately 8km to the east.
- Jemena Gas monitoring station at Horsley Park approximately 13km to the northeast.
- Lucas Heights Nuclear Reactor and medium radioactive waste repository approximately 31km to the southeast.
- RAAF Base Glenbrook approximately 15km to the northwest.
- The chlorine treatment plant at Prospect 14 km to the northeast.
- Sites having a significant quantity of Dangerous Goods in the Blacktown, Campbelltown, Fairfield, Liverpool and prospect areas.

In addition the following sensitive places where people congregate were not assessed:

- Nepean Hospitals, Westmead complex of hospitals, Campbelltown and Liverpool Hospitals.
- Schools and Universities and senior citizen care and mental health care facilities around the proposed airport
- Penrith, Blacktown and Liverpool shopping malls

c. Aircraft Accidents

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The R2A report considers aircraft crashes but does not make a distinction between passenger and cargo aircraft even though they have different risk profiles. It also does not consider hostile acts such as hijacking. These have different risk profiles to normal aircraft accidents and are the type of events which can deliberately target critical infrastructure

The accident rates for departures based on 2006 to 2015 data for worldwide commercial passenger jets (UKHSE, 2016) is 2.33E-7 per departures and 6.18E-7 per departure for cargo, charter passenger training and demonstration. Hijackings have an accident rate of 1.15E-7 and hijacking aimed at ground targets rather than plane bombings an accident rate of 5.73E-995.

The R2A report takes the number of plane movements in 2030 as 63000 movements per annum including 7000 movements per annum for cargo planes, in 2050 as 185000 movements per annum including 16500 movements per annum as cargo and in 2063 as 370000 movements per annum with 30000 movements per annum.

In Table 10-4, Vol 2A, the number of movements per day by different aircraft is given. This includes both passenger and freight movements. This data gives annual movements for stage 1 development in 2030 as 62000 for passenger jets and 10200 for cargo. This is a larger number than has been used by R2A for the risk assessment. It equates to an underestimate in the R2A report of 11% for passenger movements and of 46% for cargo movements and consequently on the accident rate.

The R2A report gives the frequency of major accidents as 0.0063 per year in 2030 and 0.037 per year 2063 assuming there is no improvement in safety.

A more complete picture of aircraft accident frequency including differentiating between passenger jets, hijacking and deliberate attacks on infrastructure are:

Normal Accidents Passenger Jets in 2030	0.00724pa
Normal Accidents Cargo in 2030	0.00316pa
Hijacked Aircraft in 2030	0.00414pa
Hijacked targeting infrastructure in 2030	0.0000012pa

While the R2A analysis is broadly in line with the Normal Accident rate for passenger jets, the analysis does not consider Hijackings, which can bring down an aircraft on normal flight paths outside the PSZs and Hijacks that target critical infrastructure in which the loss of the infrastructure causes an intolerable loss.

d. Critical Infrastructure

The risk that arises from impact on critical infrastructure comprises the frequency of impact and the magnitude of the consequential impact from loss of the infrastructure.

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For example, the consequences of loss of Warragamba dam due to loss of the dam would be a) the number of deaths caused by the water inundation that follows the destruction of the dam wall, b) the economic cost to society. Based on the flood plans for Warragamba dam, the persons exposed to a dam loss exceed 300,000 people. An inundation is significantly faster and will not allow time for evacuation resulting in much higher loss of life (Green, 25082016). The economic costs which includes the reparation of the direct damage caused and loss of life, the reparation indirect loss of business in the area due to loss of water supply until the dam is rebuilt, the cost of rebuilding the dam. Based on major losses worldwide, the estimated total cost is in the order of \$4 trillion in present day cost terms (Green, 25082016).

A plane the size of an A380 has a high enough top speed and momentum to break the top 40m of the dam wall. Assuming the dam is near full, the release of water will erode the remaining depth due to the construction design of the dam and the water velocities involved.

Because of the approach flight paths so near to the dam wall, the time between a sudden turn to attack the wall and hitting the dam wall would not be long enough for the RAAF to respond to stop the attack. Deploying missile systems near enough to take down an aircraft has a high risk of the missiles not being fired in time or hitting a target that has turned around because of an emergency on board and would be an ineffective control.

The resulting inundation at the exit of Glenbrook gorge is at least 50m high with a velocity of approximately 50km/hr. The velocity and height will ensure that the water will destroy housing within the 50m land contour of the Nepean and Hawkesbury rivers. This area is much greater than the 1 in 100 year flood area and involves exposure to more than a million people in Western Sydney. The suddenness and duration of the inrush will make it impossible for evacuation resulting in high death toll particularly at night where the death toll could easily exceed 300000 on current population statistics.

The societal risk for a deliberate impact on Warragamba dam is shown in the Figure below. The blue line shows the intolerable level of risk as a function of the number of fatalities. The orange line shows the acceptable level of risk. The red circles show the level of societal risk in 2030, 2050 and 2063 for a deliberate attempt to destroy Warragamba dam. The number of fatalities has to be below these numbers if the proposal to build the airport has a tolerable level of risk. The blue rectangle is the societal risk assuming 0.1% to 10% of the exposed population is killed based on the 1 in 100 year flood population exposure.

The proposal to build the airport at Badgerys Creek imposes an intolerable level of risk to the population of Western Sydney even in 2030 and should not be built. The economic cost of such an event is similar to the total GDP of Australia and would cause a recession across the country and particularly in Sydney.

Other Infrastructure such as loss of Western Sydney electrical distribution system for about 2 years due to the time to obtain the transformers required, would also cause an

intolerable cost to society. Consider the repercussions from the recent storms in SA and that outage for less than a day. Loss of 25% of Sydney’s electricity supply for 700 days would cause unacceptable economic loss as well as impacts on education and health.

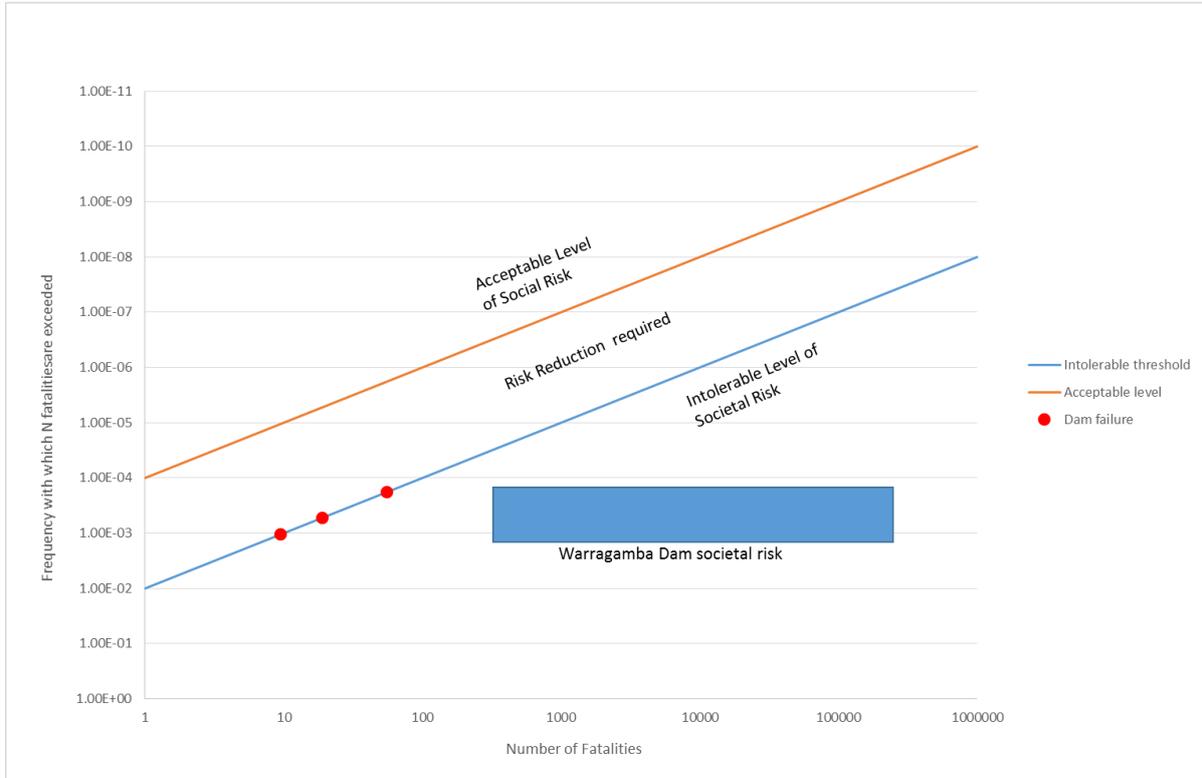


Figure . Societal Risk of the Loss of Warragamba Dam.

e. Bird and bat strike risk

The EIS states that the risk of bird and bat strike at WSA is minimal. However, this conclusion is based on insufficient data. Only one three-day survey was carried out during daylight hours only. There were no seasonal surveys, no nocturnal surveys, inadequate assessment of existing data, inadequate assessment of migratory and threatened species, and inadequate assessment of the geographical area.

The ICAO has regulations in place for the management of collisions, and requires authorities to take actions to reduce the prevalence of wildlife attracting sites within a radius of 13km of airports. The NASF guidelines (Department of Infrastructure and Transport., 2012) require airports to manage the presence of wildlife attractants within a radius of 13km from runways). These include limitation of food sources, restriction of perch sites and prevention of water access.

Within the 13 radius of the airport site there are numerous high risk sites such as Warragamba Dam and Greater Blue Mountains World Heritage National Park (GBMWHNP) that cannot be mitigated as they are protected sites, as well as agricultural

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land and numerous private dams that are all bird and bat attracting for habitat and feeding and therefore all pose a high risk of bird and bat strike.

There are numerous large flocking bird species in the region of the airport that were not identified in the EIS including; Sulphur Crested Cockatoos, Galahs and Long Billed Corellas. Other high-risk species known to inhabit the area include Kites, Eagles and Ibis. Kites are responsible for the largest number of aircraft strikes in Australia.

The EIS also does not consider the high risk of large numbers of flying foxes migrating nightly across the region and along the Nepean Valley directly bisecting proposed low altitude flight paths to the west and southwest. Night-time flights at WSA are proposed to occur solely in this direction.

8. Impacts to Children

a. Education and learning impacts

Concerns were raised about impacts from over flight noise on children and education facilities across Western Sydney and the Blue Mountains particularly on; learning capability, motivation and concentration of students. The response in the EIS identifies there could be a small increased risk of learning and cognitive development effects in children at a small number of schools from aircraft over flight noise. Of particular concern were these statements in the EIS;

“Hazard quotients are presented that represents levels above which learning and cognitive development effects could occur. In most cases hazard quotients indicated that the proposed airport would not pose an unacceptable risk to learning and cognitive development.” (Vol 5 p123)

The health risk assessment showed that for a small number of schools there were small exceedances of the World Health Organisation guidelines. (Vol 5 p177)

The EIS fails to identify the educational facilities such as day-cares, pre-schools, primary schools and high schools, which would be affected due to only using indicative flight paths. The EIS fails to show final flight paths nor the mitigation strategies so we cannot gauge the true impact of airport operations on educational facilities.

Impacts to children’s schooling have lifelong implications. Research shows high levels of aircraft noise leads to children learning to read (Boyles, 2002)and speak (Bistrup, 2011)more slowly as well as poorer school performance on national standardised tests (Jones, K., & Rhodes, D., 2013). Other studies show effects on attention and concentration levels as well as impacts on memory (United States Environmental Protection Agency, 1999). Lead exposure from aviation fuel has been shown to lower children’s cognitive abilities, increase behavioural problems such as impulsivity and hyperactivity and lower NAPLAN results (Dong, C., Taylor, M.P., Kristensen, L. J., & Zahran, S, 2015). Children exposed to higher lead levels are more likely to commit violent crimes later in life and more likely to be financially disadvantaged(John Paul Wright, 2008).

b. Mitigation measures

Submitters requested more information on mitigation measures that would be considered for educational facilities particularly schools. However, the EIS response was that these noise mitigation details and the Government’s policy on property acquisition would be considered during the detailed airspace and flight path design process in the future.

Schools under the flight path (and point merge), will be subjected to constant 24 hour noise pollution from over flight. Schools near the airport will be subjected to 24 hour noise pollution from both over flight and ground operations. In some cases the noise pollution levels at these schools will exceed World Health Organisation (WHO) Guidelines during both the day and night. (WHO European Centre for Environment and Health, 2011)

c. Children’s rights to quality education

The main international human rights treaty on children’s rights is the (Convention on the Rights of the Child, 1989). Australia ratified the CRC in December 1990, which means that Australia has a duty to ensure that all children in Australia enjoy the rights set out in the treaty. The CRC incorporates the whole spectrum of human rights - civil, political, economic, social and cultural - and sets out the specific ways these rights should be ensured for children and young people. The best interests of the child should be the primary consideration of the Australian Government in planning projects that will negatively impact children’s rights to grow, develop and learn. The EIS failed to identify mitigation measures or any special consideration of the vulnerability of children to health, social and educational impacts from the operations of WSA. These concerns were brushed aside for *“future consideration in airspace and flight path planning”*.

Western Sydney currently ranks as the most socio-economically disadvantaged area in Sydney. (Australian Bureau of Statistics, 2006) Children in Western Sydney are already subjected to negative impacts on schooling due to socioeconomic disadvantage, and many of the schools already underperform due to disadvantage.

The cumulative impacts of noise pollution, sleep deprivation and air pollution from Western Sydney Airport will only serve to widen the gap between children’s education in Western Sydney and inner Sydney suburbs.

d. Health impacts to children

Whilst the new version of the EIS now acknowledges that children are more at risk than adults to air pollution from over flight and airport ground operations, it states these risks are low in most cases. This means in some cases the risk will not be low. However, without final flight path designs, the health risk assessment is based only on the indicative flight paths making it impossible to judge the true level of risk to the population. Without a final airspace design and flight paths the Health Risk Assessment is invalid, as it not based on any real data.

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Western Sydney children have poorer health than their counterparts in inner Sydney suburbs; therefore, they face higher risks from the negative health impacts of WSA. Children’s health will be further negatively impacted by the health risks from noise pollution, such as elevated blood pressure and stress levels (Boyles, 2002) Western Sydney and the Blue Mountains currently have the highest childhood and adult obesity levels in Sydney, this is of particular concern as noise pollution has been shown to lead to increases in the rates of stroke and heart disease by 10-25%. (Toscano, 2013)

Repeated exposure to toxins from aircraft emissions poses a serious threat to the health of children, and they are more at risk than adults of developing health problems from air pollution. Toxins from aircraft emissions do not just disappear into the air, they accumulate flight after flight, day after day, over time to settle in the environment. Toxic aircraft emissions can cause a plethora of health impacts, including premature mortality, lung and respiratory problems, cardiovascular disease, lower resistance to respiratory infections, headaches, dizziness, visual disorders and memory impairment, (United States Environmental Protection Agency, 1999) impairment of lung function and neurodevelopment in children, and exacerbation of asthma in children (Ritz, B. & Wilhelm, M., 2008). Western Sydney already has the highest rate of asthma hospitalisations in Sydney. (Australian Institute of Health and Welfare, 2013)

These impacts will deny each child the opportunity to reach their full potential and will lead to further disadvantage in later life, which only serves to increase the educational, social, financial and health inequity between children of Western Sydney and the Blue Mountains and more affluent regions of Sydney.

9. Aboriginal Heritage

a. Badgerys Creek

The final EIS fails to acknowledge the importance of an Aboriginal heritage assessment of the whole Badgerys Creek site in their response to concerns raised in the drafts EIS. The Traditional Owners were not consulted for assessment of the cultural heritage significance of the Badgerys’ creek site as identified in the SMEC report:

“As consultation with representatives of the local Aboriginal community was not undertaken for this investigation, no assessment of the cultural heritage significance has been carried out. The Traditional Owners of the area have not been afforded the opportunity to provide input or discussion to this investigation as stakeholders for the area, nor to provide any relevant cultural knowledge relating to potential cultural or spiritual sites, objects or places within the Commonwealth owned land at Badgerys Creek”. (Australian Museum Consulting for SMEC Australia, 2014)

The Commonwealth Government’s action in intentionally denying Aboriginal assessment of cultural heritage significance of the Badgerys Creek site amounts to tokenism. Culturally appropriate, respectful engagement with the Darug and Gundungurra Traditional Owners and Custodians has not occurred.

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Without an Aboriginal heritage assessment all subsequent archaeological research and fieldwork results, while significant, can only be considered in an isolated, fragmented context.

Only after assessment by the Traditional Owners and Custodians can the aboriginal cultural heritage significance of the entire Badgerys Creek site be established. The Commonwealth Government needed to consult with the Traditional Owners and arrange for an assessment to be conducted. However, the release of the final EIS clearly shows that a ‘tick the box’ process is acceptable, effectively dismissing the rights of Aboriginal people and the important significance of Aboriginal culture.

b. Impacts to the GBMWA

The EIS failed to address the Darug and Gundungurra people’s valid concerns of the impact on cultural heritage in the GBMWA. It is clear that there will be a significant impact. By 2063 the proposed no curfew WSA will service 370,000 aircraft movements annually. Noise pollution alone will have a significant impact on Aboriginal cultural heritage.

UNESCO acknowledges the strong cultural connection in the world heritage listing; *“An understanding of the cultural context of the GBMA is fundamental to the protection of its integrity. Aboriginal people from six language groups, through ongoing practices that reflect both traditional and contemporary presence, continue to have a custodial relationship with the area. Occupation sites and rock art provide physical evidence of the longevity of the strong Aboriginal cultural connections with the land. The conservation of these associations, together with the elements of the property’s natural beauty, contributes to its integrity”.* (United Nations World Heritage, 2016)

10. World heritage status of GBMWA

a. Threat to world heritage status from WSA

The long-term impacts on the GBMWA cannot be determined by the final EIS. The lack of final airspace design and flightpaths make it impossible for biodiversity, noise pollution or air pollution impacts to be determined. Final flight paths, frequency of aircraft movements daily and nightly, types of aircraft and cumulative impacts are required for a thorough impact assessment.

It is important to note that the Blue Mountains was finally accepted for world heritage listing only after the Howard government abandoned plans for the Badgerys Creek Airport in December 2000 as stated by UNESCO; *“UNESCO rejected Australia’s nomination for world heritage status for the Blue Mountains between 1999 and 2000, citing Howard government plans for Badgerys Creek.”* (Curtin, 2015)

“Most of the natural bushland of the GBMA is of high wilderness quality and remains close to pristine. The plant communities and habitats occur almost entirely as an extensive, largely undisturbed matrix almost entirely free of structures, earthworks and other human intervention. Because of its size and connectivity with other protected areas, the area will continue to play a vital role in providing opportunities

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for adaptation and shifts in range for all native plant and animal species within it, allowing essential ecological processes to continue.

Additional regulatory mechanisms, such as the statutory wilderness designation of 65% of the property, the closed and protected catchment for the Warragamba Dam and additions to the conservation reserves that comprise the area further protect the integrity of the GBMA. Since listing, proposals for a second Sydney airport at Badgerys Creek, adjacent to the GBMA, have been abandoned.” (United Nations World Heritage, 2016)

The above statement from UNESCO clearly shows the importance of the decision to abandon the airport at Badgerys creek in 2000 to the integrity of the world heritage values of GBMWA.

11. Biodiversity

a. Clearing of the Cumberland Plains

The EIS advises that 280 hectares of native vegetation will be removed from the airport site. This includes 148 hectares of Cumberland Plain Woodland. The Cumberland Plains Woodland is endangered and also provides habitat to critically endangered species such as the Swift Parrot and Cumberland Land Snail.

Clearing airport site vegetation such as Cumberland Plains Woodland will knowingly destroy habitat of the critically endangered Swift Parrot. It is estimated that there are only 2,000 left. Recent illegal logging in Tasmania has led to the destruction of known nesting trees of the Swift Parrot. Australia's Threatened Species Commissioner Gregory Andrews said he was devastated by the destruction of habitat. *"They're closer to extinction than Africa's white rhinoceros," he said.* These are migratory birds that nest in Tasmania, and feed at other times in Victoria and NSW. Given the low numbers of birds left, to have observed them feeding at the airport site (recorded in EIS) is very significant. (Gramenz, 2016)

Clearing the Cumberland Plains Woodland will also cause the destruction of known populations of the critically endangered Cumberland Land Snail. Cumberland Land Snail feeds on fungus that grows on Cumberland Plains Woodland leaf litter, so relocation to new habitats is unlikely to be successful. (NSW Government Office of Environment and Heritage, 2016)

According to NSW Government; *“The project requires significant environmental offsets to compensate for the loss of native vegetation.”* There are insufficient remaining areas of Cumberland Plains Woodland for "offset" to be a possible strategy. Experimental evidence indicates that replanting does not work to replace Cumberland Plains Woodland.

12. High Speed Rail

a. High speed rail as an alternative to building WSA

High speed Rail (HSR) was not explored as a genuine alternative to alleviating capacity at KSA. There was no comparative cost/benefit comparison of HSR as required by the guidelines. (6) European studies show HSR is competitive for journeys under 3 hrs along core routes taking 80% of the passengers. This reduces the capacity of KSA by 42% and negates the need for an additional airport

HSR provides a better cost benefit ratio than building an airport as it opens up regions of Victoria, NSW and Queensland for job, tourism business opportunities. The level of growth is supported by studies of the economic benefits of the introduction of Health Safety and Wellbeing in Europe, Japan and China.

In Europe, air routes have been cancelled due to out competition by HSR. Time is not the only factor involved. Comfort, accessibility, quiet, ability to move around, reduced motion sickness, access to wireless communication, disability access, access to regional towns, views, operates in all weather conditions. In his biography, Kurt Fearnley, describes the difficulties and humiliation of air travel with a wheelchair. (Fearnley, 2014)

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