40. Conclusion and recommendations

40.1. Introduction

The proposed airport would be developed progressively as demand increases beyond the scope of Stage 1. Additional aviation infrastructure and support services such as taxiways, aprons, terminals and support facilities would be required to service the growing demand. A second runway is forecast to be required by around 2050 and would be located parallel to the first runway with a centre line separation distance of approximately 1,900 metres. The long term capacity of the proposed airport is forecast to service approximately 82 million annual passengers which is equivalent to approximately 370,000 air traffic movements.

It is recognised that implementation of the Stage 1 development would facilitate future growth in the capacity at the proposed airport, so a strategic assessment of the anticipated long term development is considered appropriate.

The high-level strategic assessment recognises the uncertainty in predicting impacts which may occur nearly 50 years into the future and the additional approval and consultation requirements for all future development. The assessment approach provides flexibility in the master planning process for the site to allow land use changes, technological improvements and changes in operational practices to be reflected in future development scenarios.

40.2. Key environmental impacts

The focus of the assessment for the long term development centres on potential impacts of the expanded operations on the amenity of the surrounding community. Key issues considered as part of the assessment of the long term operation of the proposed airport include noise, air quality, human health, traffic and transport, landscape and visual amenity, and socio-economic impacts. Direct physical impacts are also discussed, including those associated with biodiversity, water resources, heritage and planning and land use. A summary of the key findings of the assessment of the long term development are outlined below.

40.3.0 Noise

It is recognised that aircraft noise is one of the most sensitive issues associated with the development of the proposed airport and an increase in air traffic movements has the potential to increase the level of noise disturbance to the surrounding community. Taking this into account, the long term assessment considers aircraft noise impacts for a 2050 scenario which is representative of the single runway operating close to capacity, as well as anticipated impacts for an airport operating with two runways at around 2063.

The flight paths and procedures to be used by aircraft using the proposed airport (either for the single runway or the two runway scenario) are indicative and are required to undergo further detailed consideration prior to being finalised. Other sources of uncertainty such as noise emission levels from future aircraft types, and the role and pattern of movements at a dual runway airport also reduce the certainty in predicting impacts into the future.

For the loudest aircraft operations (long-range departures by a Boeing 747 aircraft or equivalent), maximum noise levels over 85 dBA would be experienced at residential locations near the airport site. Maximum noise levels of 75–80 dBA are predicted within built-up areas in St Marys and Erskine Park. Maximum noise levels from more common aircraft types such as Airbus A320 or equivalent are predicted to be 60–70 dBA in built-up areas around St Marys and Erskine Park, and over 70 dBA in some areas to the south-west of the airport such as around Greendale.

The extent to which particular areas would be potentially exposed to aircraft noise would be strongly influenced by the airport operating strategies especially when operating a single runway at maximum capacity. In terms of total population, the 'Prefer 05' operating strategy (which gives preference to approaches and departures in a south-west to north-east direction) is predicted to have substantially more impact on existing residential areas than the 'Prefer 23' operating strategy, in which the opposite direction is preferred. Most residents that would be affected under the 'Prefer 05' strategy are in suburbs to the north of the airport site, including St Marys and Erskine Park. Predominantly rural-residential areas to the south-west, including Greendale and parts of Silverdale would be affected under the 'Prefer 23' strategy. Adoption of 'Head to Head' operations would also slightly reduce the number of residents affected.

For night-time operations in 2050, the operating strategy with least impact is 'Prefer 23 with Head-to-Head'. Other operating strategies are predicted to result in substantially greater numbers of residents being affected by night-time noise, and in particular, a 'Prefer 05' strategy would result in large parts of St Marys experiencing more than 20 aircraft noise events per night above 60 dBA.

The operating strategies would have less influence following the implementation of operations on the second runway. Despite the forecast number of movements at the airport approximately doubling between 2050 and 2063, there are fewer densely populated areas currently located within the noise affected areas, particularly for the Prefer 05 operating strategy. The reason is that movements can be spread between two runways and the locations of flight paths are less constrained in the two runway scenario. The total number of residents affected may increase in the future as a result of population growth and ongoing housing development over the next 50 years. The continuation of existing planning controls will limit the potential for new residential development to be impacted by a progressive increase in usage of the airport.

Australian Noise Exposure Concept (ANEC) contours for the indicative long term development are similar to those for the single runway airport in 2050, although they extend over a somewhat larger area to the south as a result of operation of the second runway. For the 2063 scenario, the 20 ANEC contour does not enclose any existing built-up residential areas including the townships of Warragamba and Silverdale.

The identification of potential noise abatement operating modes would be an important consideration in the future formal airspace design process to be undertaken closer to the proposed commencement of operations. Other approaches to mitigating aircraft overflight noise generally focus on reducing noise emissions from the aircraft themselves, planning flight paths in a way that minimises potential noise and environmental impacts and provides respite periods, together with implementing land use planning controls and other relevant operating practices.

Noise impacts associated with aircraft operations at the proposed airport are expected to be monitored using the noise and flight path monitoring system operated by Airservices Australia.

40.3.1. Air quality

Dust emissions similar to those assessed for the construction of the Stage 1 development would be generated during construction activities undertaken progressively as part of the long term development. It is anticipated that dust emissions would be closely controlled as there are significant safety issues associated with dust generation in the vicinity of an operational airport that would require much more stringent management than a typical construction programme.

The progressive increase in aircraft movements and site based activities would increase the level of emissions during the operation of the long term development. With the exception of roadways external to the airport site, aircraft movements were again predicted to be by far the largest source of PM_{10}, $PM_{2.5}$, NO_X and SO_2. Aircraft and stationary sources, in particular evaporative loss from the jet fuel tanks, were shown to be a significant contributor to VOCs emissions and corresponding predicted ground level concentrations. There is an increased potential for the formation of secondary pollutants such as ozone through the photochemical reaction between emissions of precursor gases associated with the proposed development including NO_x, VOCs and CO.

A key assumption integral to the assessment of the long term development was that no improvement in aircraft emissions, either due to improvements in fuel or engine emissions was able to be incorporated into the modelling. This is based on the inability to predict the effect of future policies or technological developments which are expected to occur and which are likely to result in improvements in levels of combustion emissions and pollutants. The assessment is therefore considered to be conservative. Given the uncertainty about emissions from a future aircraft fleet, combined with an expected improvement in aircraft emissions over time, the long term development was evaluated only for the air quality metrics, namely: PM_{10}, $PM_{2.5}$ and NO_X.

The results of the dispersion modelling indicate that exceedances of the short term nitrogen dioxide ambient objective may be experienced at seven residential receptors for very limited periods of between one and two hours per year. Exceedance of short term cumulative PM_{10} concentrations would be limited to one on-site receptor representing impacts upon airport staff and passengers. Predicted cumulative short and long term $PM_{2.5}$ concentrations are predicted above the NEPM advisory reporting goals at a number of surrounding receptors, largely as result of the existing background level concentrations.

The maximum predicted 1-hour and 4-hour ozone concentrations increased by a maximum of 0.2 parts per billion during the operation of the long term development. Both predicted base case and the long term development were generally above the NEPM criteria. Larger ozone incremental increases in the surrounding localities were recorded for the long term development, driven primarily by the increase in NO_X and VOC emission sources.

Actual air emissions from the long term development may be lower than predicted given use of mains powered auxiliary power units at airport gates, increased use of public transport (instead of motor vehicles) to travel to and from the airport, as well as progressive improvements in aircraft technology.

40.3.2. Surface water and groundwater

The long term development would represent a continuation of the impacts identified for the Stage 1 development with regards to water resources. By transforming the southern portion of the airport site to an essentially built environment, the airport development would alter the catchment areas within the airport site over the long term. This would alter the permeability of the ground surface, which in turn would alter the duration, volume and velocity of surface water flow.

Hydrologic and hydraulic modelling of the airport site indicates the drainage system is generally effective at mitigating watercourse and flooding impacts and further refinement would be required to occur during the detailed design stage.

Minor alterations to local groundwater recharge and drawdown are anticipated to occur at the airport site, along with the need for minor dewatering as a result of the establishment of building basements or station cavities. Changes to groundwater conditions at the site are anticipated to be minimal and are not expected to impact any sensitive ecological receptors or beneficial uses of the groundwater system.

Baseline and ongoing monitoring of surface water and groundwater would be undertaken to characterise any residual impacts and prompt corrective action where necessary.

40.3.3. Traffic

Long term operation of the airport is expected to result in around 85,000 vehicle trips to and from the airport each day by 2063. These additional trips would be generated in the context of substantial urban growth forecasts for Western Sydney. Airport generated travel and the forecast development growth in Western Sydney would significantly increase demand on roads and public transport. With or without the proposed airport, the road network is forecast to be considerably congested by 2063. The assessment indicates:

- the M4, M5 and M7 motorways have high volume/capacity ratios;
- Bringelly Road is congested eastbound in the AM peak and westbound in the PM peak; and
- Narellan Road is considerably more congested than in 2031.

In anticipation of this, a significant amount of road improvement works, including a new M12 Motorway, are being delivered ahead of the proposed airport as part of the Western Sydney Infrastructure Plan. To cater for the expected passenger and employee traffic demand associated with the proposed airport, these works are being designed with growth capacity.

Long term operation of the proposed airport would be reliant on the introduction of the South West Rail Link extension. Even with the extension in operation, the increase in demand by 2063 shows that detailed planning and transport upgrades would be required to cater for the growth associated with the proposed airport and other development in the region.

40.3.4. Socio economic

The long term development of the proposed airport would result in significant opportunities for regional and wider economic benefits through direct, indirect and induced spending. Benefits will be accrued beyond the aviation industry, and extend to such industries as construction, utilities, trade, transport, accommodation, retail professional services and administration.

The proposed airport would also create better business development opportunities in Western Sydney as businesses will have access to a large labour pool and proximity to markets and supporting businesses. There would be relatively higher employment densities in Western Sydney, particularly in areas like Penrith and Blacktown, but also in Liverpool, Fairfield and Camden and across the rest of Sydney's West.

Social impacts during the long term development would include changes to amenity of communities and recreational areas in proximity to the airport and those within the flight paths due to overflight noise, ground based noise from the airport operations and visual impacts from overflights.

40.3.5. Planning and land use

Construction and operation of the proposed airport would change the rural character of the airport site and surrounding land uses. This land use outcome has been anticipated in Australian, NSW and local government strategic planning for the area over several decades.

The proposed airport would be a key anchor for employment generating development in Western Sydney, creating jobs for the new residents of the South West Priority Growth Area.

40.3.6. Visual

Future development of the areas surrounding the airport site, under provisions of the Western Sydney Employment Area and the South West Priority Growth Area, would lead to a significant transition from an environment that is predominantly rural in character to one that has a more urban form. In general terms, this is expected to reduce the visual impact of the proposed airport development, including night-time lighting effects, as the proposed airport is integrated into the changing urban visual character of the area.

40.3.7. Greater Blue Mountains World Heritage Area

Potential indirect impacts on World Heritage values from the operation of the airport were assessed having regard to the attributes identified in the Statement of Outstanding Universal Value for the GBMWHA and the complementary values of the area as defined in the GBMWHA Strategic Plan. The assessment considered noise, air emissions and amenity impacts from the overflight of aircraft.

The assessment's findings are that the proposed airport would not have a significant impact on the GBMWHA. In particular, the indirect impacts of long term airport operation would not result in an attribute of the property being lost, degraded or damaged, or notably altered, modified, obscured or diminished.

40.3.8. Other Environmental Matters

There is potential for a range of direct physical impacts to arise from the expansion of the development footprint within the airport site. Impacts upon biodiversity, topography, Aboriginal heritage and European heritage would typically form a continuation of the disturbance footprint associated with the Stage 1 development. These would be considered as part of the future approval requirements for the site.

The health risk assessment considers the likely health impacts of the long term development of the proposed airport. While there are limitations in undertaking an assessment of predicted health risk so far into the future, overall the assessment found that the predicted health risk associated with the long term development would increase from the Stage 1 development, but would remain in line with national and international standards of acceptability.

40.4. Future environmental assessment and approval processes

Part 5 of the Airports Act requires an ALC to prepare an airport master plan to provide the strategic direction for the airport site for a period of 20 years. For the Western Sydney Airport, the ALC would be required to submit for approval a full master plan within five years of an airport lease being granted or such long period as the Minister for Infrastructure and Regional Development allows. Following approval, the master plan would be required to be updated every 5 years.

The ALC would also be required to prepare major development plans for future major airport developments that are not authorised by the Airport Plan. Major developments are defined in section 89 of the Airports Act to include items such as constructing or modifying runways, certain buildings, taxiways, transport links or any development that is likely to have significant environmental or community impacts. The Minister for Infrastructure and Regional Development is required to seek the advice of the Minister for the Environment before deciding to approve a draft major development plan.

Most future building activities on the airport site, including those authorised by Part 3 of the Airport Plan, require building approval and certification under the *Airports (Building Control) Regulations 1996* once an airport lease is granted. Approval and certification is given by the airport building controller and must be consistent with the relevant planning instrument (for example, the Airport Plan, master plan or major development plan).

The Airports Act and the *Airports (Environment Protection) Regulations 1997* set out the framework for the regulation and management of activities at airports that have potential to cause environmental harm. The ALC for the proposed airport will be responsible for operational environmental management.

40.5. Summary

This EIS has been prepared in accordance with Part 3 of the EPBC Act and the Department of the Environment guidelines for the assessment of the airport proposal.

The proposed Western Sydney Airport is required to meet the long term aviation requirements of the Sydney basin. The proposed airport has been demonstrated by a number of studies over several decades to be the preferred option for meeting capacity constraints over the long term. The proposed airport would increase access to aviation services for the people of Western Sydney and provide significant economic benefits over the long term for the region.

The design of the proposed long term airport would be developed as part of the master planning process and would be subject to further assessment and approval requirements in accordance with the Airports Act. This assessment has identified a number of environmental and social issues that would need to be addressed as part of the future approval processes.

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