Chapter 27
Cumulative impacts

Contents

List of tables

List of figures

27. Cumulative impacts

Chapter 27 provides an assessment of the potential impacts resulting from the development of the Moorebank Intermodal Terminal (IMT) Project (the Project) in conjunction with the development of the Sydney Intermodal Terminal Alliance (SIMTA) site and other planned or proposed developments in the local area.

The SIMTA site, located immediately east of the Project site, is subject to a proposal for the construction and operation of an IMT (the SIMTA project), which would ultimately have capacity for one million twenty-foot equivalent units (TEU) a year and 300,000 square metres (sq. m) of warehousing. On 6 March 2014 the SIMTA EIS under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was approved, subject to a number of conditions. On 29 September 2014, the NSW Planning Assessment Commission (PAC) determined to approve the SIMTA concept plan, with modifications and subject to further assessment requirements, including a upper limit on throughput capacity of 500,000 TEU a year.

As discussed in Chapter 3 – *Strategic context and need for the Project,* the freight catchment demand is not likely to exceed 1.05 million TEU a year, plus 500,000 TEU of interstate freight. In addition, there is insufficient capacity on the Sydney Southern Freight Line (SSFL) even assuming that future upgrades are made to the SSFL, to accommodate an IMEX throughput of more than 1.05 million TEU per year and 500,000 TEU interstate to Moorebank. Accordingly, there is no prospect of both projects operating jointly in their currently proposed forms.

In recognition of community and approval agencies' concerns about the prospect of both the Project site and the SIMTA site being developed in some way; three realistic scenarios have been developed for the cumulative impact assessment. These scenarios, as detailed in section 27.1, assume a combined IMT precinct across both sites, which is considered to be a likely outcome, given the need for an IMT facility at Moorebank that can efficiently service Sydney's west and south-west subregion.

This chapter presents a summary of the results of both the cumulative qualitative and quantitative assessment of the impacts of the three scenarios (as explained further in section 27.1), with detailed assessment results provided in technical studies in Volume 3 to Volume 9.

In addition to providing a cumulative impact assessment of the Project in combination with the SIMTA project, this chapter also considers the relationship of the Project to, and its potential cumulative impacts on, other planned or proposed developments in the local area. This assessment is more high-level in nature and is provided in section 27.2.3 of this chapter.

This cumulative impact assessment addresses the Commonwealth Department of the Environment (DoE)'s Environmental Impact Statement (EIS) Guidelines and the Secretary for the NSW Department of Planning & Environment (NSW DP&E)'s Environmental Assessment Requirements (NSW SEARs) as listed in Table 27.1.

Table 27.1 Relevant Commonwealth EIS Guidelines and NSW SEARs

Requirement	Where addressed
Commonwealth EIS Guidelines under the EPBC Act	
An assessment of the impact of the proposal over the operational life must be considered in combination with the impacts of other relevant existing, approved or proposed activities in the dimensions of scale, intensity, duration or frequency of the impacts.	Section 27.2.
A discussion of the known and potential developments in the local region on the environmental values of land, impacts to air and water and public health. This assessment may include air and water sheds affected by the proposal.	Known and potential developments in the local region, and their cumulative impacts with the Project, are discussed in section 27.2.3.
Its (the Project's) relationship to and interaction with adjoining development(s), including the proposed intermodal on the SIMTA site.	Section 27.2.
NSW SEARs under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)	
• the development's relationship to and interaction with adjoining development, including the proposed intermodal on the SIMTA site and consideration of cumulative impacts of the two intermodals;	Sections 27.1, 27.2 and 27.2.3. The SIMTA project as currently proposed has not been assessed; instead, three cumulative scenarios have been considered.
• consideration of the cumulative impacts of this proposal with the adjacent SIMTA proposal and other existing and proposed freight distribution facilities in the locality and on local and regional road and rail networks;	Cumulative impacts from three SIMTA development scenarios are discussed in section 27.2. No other freight distribution facilities exist or are proposed in the locality.
• assessment of the noise and vibration impacts from the development (on and offsite), including cumulative impacts from associated precursor activities, the SSFL and the SIMTA intermodal proposal on sensitive receivers;	The SIMTA project as currently proposed has not been assessed; instead, three cumulative scenarios have been considered. Cumulative noise impacts are described in this chapter (refer to sections 27.2.1 and 27.2.2). Noise and vibration impacts of the Project are described in Chapter 12 – *Noise and vibration*. The cumulative impacts of the Project with other projects are discussed in section 27.2.3.
• identify impacts of the pollutants on human health, including cumulative impacts from background air pollution.	Chapter 25 – *Human health risks and impacts* covers impacts of the Project on human health, and incorporates outputs of the local and regional air quality impact assessments described in Chapter 17 – *Local air quality* and Chapter 18 – *Regional air quality*. Cumulative background air pollution from the SSFL and Glenfield Landfill site formed part of the local air quality assessment. The cumulative air and human health impacts of the Project and the SIMTA development are described in section 27.2.2.

27.1 Assessment approach

27.1.1 Selecting the cumulative assessment scenario

SIMTA's development proposal is set out in its EIS, which was on public exhibition between 28 March and 28 May 2012; 19 June and 13 August 2013; and from 4 September to 21 October 2013. The proposal comprises a 1 million TEU IMEX facility and 300,000 sq. m warehousing.

The NSW SEARs for the Moorebank IMT Project require MIC to consider the cumulative impacts of its development with the impacts of the SIMTA project. However, in the course of considering the situation in which both projects operate simultaneously, it became apparent that, as a consequence of rail network constraints, particularly on the SSFL, and even assuming that upgrades are made to the line (including additional passing loops and intermediate signalling), rail freight to Moorebank cannot exceed 1.7 million TEU a year. Furthermore, freight demand analysis undertaken by Deloitte in 2013 concluded that the demand for IMEX through a terminal at Moorebank would be limited to approximately 1.05 million TEU a year. This estimate of demand was confirmed as reliable by Transport for NSW (TfNSW) in July 2013. As such, there would be insufficient demand for both projects to operate simultaneously in their currently proposed forms, and therefore the cumulative impacts of this scenario have not been assessed or presented in this EIS.

In order to assess the potential cumulative impacts of both the Project and the SIMTA development, three realistic scenarios have been developed based on a combined IMT precinct with IMT and warehousing facilities distributed across the two sites. These scenarios are outlined in Table 27.2. All scenarios are based on the operations of the two developments at the year 2030.

The NSW Planning Assessment Commission (PAC) recent determination to approve the SIMTA concept plan, with modifications and subject to further assessment requirements, placed an upper limit on throughput capacity of 500,000 TEU a year on the SIMTA site. However, the cumulative assessment and the assessment scenarios developed for this EIS are based on rail network constraints, particularly on the SSFL, being a maximum capacity of 1.7 million TEUs a year. Therefore, the scenarios have not been modified following the PAC determination.

Table 27.2 Cumulative impact scenarios

Scenario	Moorebank IMT site (Project site)	SIMTA site
Cumulative impact scenario 1	• IMEX terminal at 1.05 million TEU per year • Interstate terminal at 500,000 TEU per year • 300,000 sq. m warehousing	• 300,000 sq. m warehousing
Cumulative impact scenario 2	• IMEX terminal at 500,000 TEUs per year • Interstate terminal at 500,000 TEU per year • 300,000 sq. m warehousing	• IMEX terminal at 500,000 TEU per year • 300,000 sq. m warehousing
Cumulative impact scenario 3	• Interstate terminal at 500,000 TEU per year • 300,000 sq. m warehousing	• IMEX terminal at 1 million TEU per year • 300,000 sq. m warehousing

This chapter presents a summary of the results of both the qualitative and quantitative assessment of the cumulative impacts of the Project and the SIMTA development consistent with the scenarios outlined above, with detailed assessment results provided in technical studies in Volume 3 to Volume 9.

27.1.2 Rail access

For cumulative scenario 1, it is assumed that access from the SSFL to the Moorebank IMT would be via the northern rail access option, passing through the former Casula Powerhouse Golf Course, as this is considered a worst case in terms of noise impacts.

For cumulative scenarios 2 and 3, access to the Moorebank IMT and the SIMTA IMT would be via the southern rail access option, crossing the Glenfield Landfill site. It is assumed that only one rail access would be built to service both sites, on the basis that it would be uneconomical to build two accesses and taking into account Australian Rail Track Corporation (ARTC)s advice that it would not support two separate rail access points.

27.1.3 Cumulative scenario 1

Cumulative scenario 1 assumes that the SIMTA site would operate as an intensified warehousing development that would support the operation of the Moorebank IMT Project. A number of assumptions have been made to define and assess cumulative scenario 1 including:

- The Moorebank IMT would operate as proposed in this EIS;
- The SIMTA development would have an indicative warehouse capacity of 300,000 sq. m gross floor area (GFA);
- Both sites would operate 24 hours a day, seven days a week; and
- The SIMTA development would have an operational workforce of 1,470 staff on site per day (three shifts per day).

27.1.4 Cumulative scenario 2

Cumulative scenario 2 consists of an IMEX terminal on both the Moorebank IMT site and the SIMTA site, each with capacity for 500,000 TEUs per year and 300,000 sq. m of warehousing on both sites. The Moorebank IMT would include an interstate terminal with 500,000 TEUs throughput. The following assumptions were made for cumulative scenario 2

- Both sites would operate 24 hours a day, seven days a week;
- The SIMTA development would have an operational workforce of 1,581 staff on site per day (three shifts per day);
- The Moorebank IMT site would have an operational workforce of 1,987 staff on site per day.

27.1.5 Cumulative scenario 3

Cumulative scenario 3 consists of an IMEX terminal on the SIMTA site only with throughput of 1 million TEU per year, as well as 300,000 sq. m of warehousing. An interstate terminal of 500,000 TEU per year and 300,000 sq. m of warehousing would be located on the Project site. The following assumptions were made for cumulative scenario 3:

- Coth sites would operate 24 hours a day, seven days a week;
- The SIMTA development would have an operational workforce of 2,258 staff on site per day (three shifts per day);
- The Moorebank IMT site would have an operational workforce of 1,800 staff on site per day.

27.1.6 Assessment approach

The cumulative impact scenarios have been developed the purpose of assessing the cumulative impacts of the Project with the SIMTA development. It should be noted that no consultation with SIMTA was undertaken in developing the cumulative scenarios.

Where relevant, some information from the SIMTA *Draft Commonwealth Environmental Impact Statement* under the EPBC Act (Hyder Consulting 2013) (hereafter referred to as the SIMTA EIS) and the SIMTA *Environmental Assessment Part 3A Concept Application* (Urbis 2013) (hereafter referred to as the SIMTA EA) has been used in the assessment of the environmental issues relating to a proposed SIMTA development.

For environmental issues with potentially significant cumulative impacts, these impacts have been considered quantitatively. This has included an assessment of the traffic and transport, noise and vibration, local air quality and biodiversity impacts of the Project and the SIMTA development. Other impacts including heritage, social, hazards and risks, hydrology, greenhouse gas, visual and human health have been assessed qualitatively, as further discussed in section 27.2.2.

The approach to assessing the impacts of the cumulative scenarios has involved the following:

- qualitative assessment of the cumulative construction impacts, where construction activities and scheduling are expected to overlap; and
- assessment of the cumulative operational impacts once both sites are fully developed, i.e. at Full Build (2030), including quantitative assessment of the key focus areas of air quality, noise, traffic and biodiversity and a qualitative assessment of other environmental issues.

In terms of the traffic and transport, noise and vibration and local air impacts of the SIMTA development, where applicable, the assumptions for the warehousing component of the Moorebank IMT have been applied to the warehousing component of the SIMTA development, because the quantity of assumed warehousing is the same for both developments. In addition, the following assumptions have been applied to cumulative scenarios 1, 2 and 3:

- traffic generation rates and assumptions within the Project site (refer to section 4 of the Technical Paper 1 – *Traffic and Transport Impact Assessment* in Volume 3 of this EIS);
- the traffic generated by standalone warehousing on the SIMTA site or surplus warehousing on the Moorebank IMT site utilises the Roads and Maritime Services (RMS) daily trip generation rate, with 4.2% of daily trips occurring during peak hours;

- source sound power levels for all plant within the Project (refer to section 6 of Technical Paper 2 – *Noise and Vibration Impact Assessment* in Volume 3 of this EIS);
- emission factors and source characteristics from the Project Full Build 2030 assessment (refer to Technical Paper 7 – *Local Air Quality Impact Assessment* in Volume 6 of this EIS); and
- the majority of the staff would arrive and depart outside the peak periods on the road network, and the maximum traffic generation would occur during the shift changeover (at 8.00 am and 5.00 pm).

Should both the Project and the SIMTA project receive approval and progress to detailed design, the cumulative impacts of both projects would be considered in further detail during Stage 2 SSD applications.

For other planned or proposed developments within the local region, a qualitative assessment of the cumulative impacts has been undertaken. The results of this assessment are provided in section 27.2.3.

Approach to cumulative assessment – construction phase

The construction timing and phasing of a combined Moorebank IMT and SIMTA development (under the three cumulative scenarios) is not yet known. Therefore, rather than making assumptions on the construction timing for each cumulative scenario, a high level approach has been taken where the overall project schedules for the Moorebank IMT and the SIMTA development as presented in this EIS and the SIMTA EIS, have been used as a basis of assessment (refer to Table 27.3). That is, the cumulative assessment does not consider each of the three cumulative scenarios but rather considers development on the SIMTA development in accordance with the timing outlined in the SIMTA EIS.

Construction-related cumulative scenarios involving the Project and the SIMTA development (cumulative scenarios 1, 2 or 3) could include:

- both projects under construction (no operational elements);
- one project under construction during the operation of the other; and
- a mixture of construction and operational activity occurring simultaneously on both projects.

A more detailed assessment of the Project's cumulative impacts with the SIMTA development would be undertaken during the subsequent Stage 2 SSD approval processes, once more information on the project timing is known.

Approach to cumulative assessment – operational phase

In terms of assessment of the operational impacts of the Project and the SIMTA warehousing development, a worst case scenario has been adopted that assumes both the Project and the SIMTA site are operating at Full Build (in 2030). Figure 27.1 shows an aerial view of the SIMTA warehousing development adjacent to the Project site.

The operational cumulative assessment has considered the major potential cumulative impacts, which relate to traffic, local air quality, noise and vibration and biodiversity impacts, as described in detail below. Other potential cumulative operational impacts have been assessed qualitatively at a high level.

Traffic assessment during operation

The approach to assessing the cumulative traffic and transport impacts of the Project and SIMTA warehousing development included:

- calculating the expected traffic generation from each project at Full Build (2030); and
- modelling the proposed future intersection upgrades along Moorebank Avenue using SIDRA (an intersection modelling tool) to forecast the operation of the network for 2030, at full operation of the Project and the SIMTA warehousing development (refer to Figure 11.2 in Chapter 11 – *Traffic, transport and access).*

For cumulative scenario 1, the Moorebank Avenue (including the proposed upgrades) and the Moorebank Avenue intersections were modelled for the northern rail access option and associated IMT layout only. This is because the Project layout associated with the northern rail access option has the greatest volume of Project trips entering and exiting the southernmost Moorebank IMT access intersection on Moorebank Avenue (also referred to as the main IMT access).

For cumulative scenarios 2 and 3, the assessment considered the southern rail access option and associated IMT layout because, as explained in section 27.1.2, the southern rail connection would provide access to both project sites.

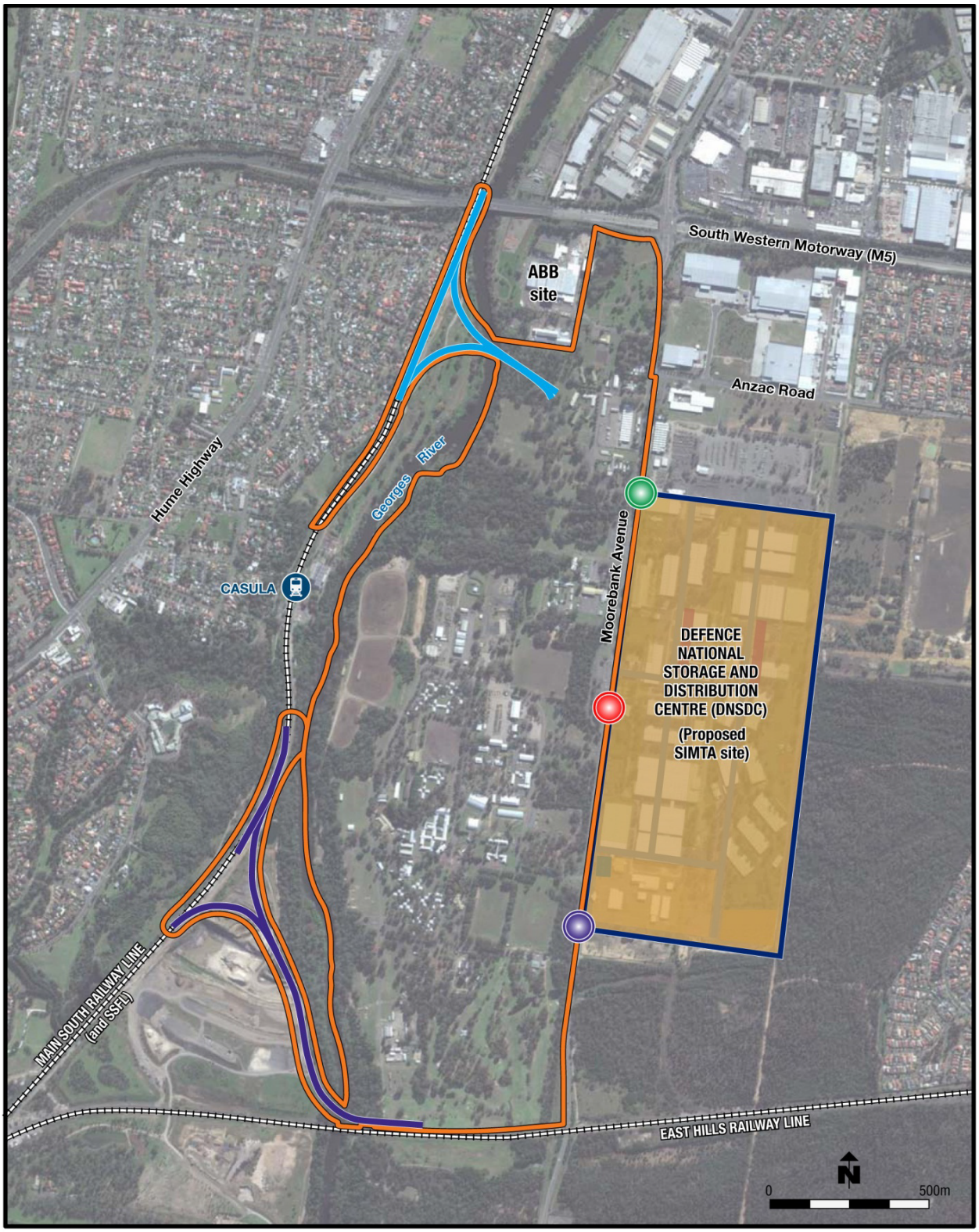


Figure 27.1 Location of SIMTA site

Local air quality assessment during operation

The approach to assessing the cumulative air quality impacts of the Project and the SIMTA development included:

- analysis of appropriate background air quality data and Project representative meteorological conditions (to determine the existing climate and ambient air environment to be used in air quality modelling);
- reviewing potential air emission sources for the operational phases of the Project and the SIMTA development;
- developing an air emission inventory of all potential local air pollutant sources for the Project and the SIMTA development; and
- quantitative assessment of potential local air quality impacts during operation of the Project and SIMTA development, using the AMS/US-EPA regulatory model (AERMOD).

The cumulative air quality assessment included consideration of the potential impacts of the SIMTA development associated with each of the three cumulative scenarios and associated rail access options.

The cumulative assessment follows the assumptions and the emission sources adopted for the Project at Full Build, with additional emission sources from the proposed SIMTA facilities included in the model inputs (refer to Figure 17.4 in Chapter 17 – *Local air quality* and section 12 of Technical Paper 7 – *Local Air Quality Impact Assessment).*

Noise and vibration assessment during operation

The approach to assessing the cumulative noise and vibration impacts of the Project and the SIMTA development included:

- undertaking a quantitative assessment of potential impacts at nearest receivers for the operation of the Project and SIMTA development; and
- assessing potential noise and vibration from road and rail traffic movements on the surrounding transport networks for the Project and SIMTA development.

The noise impacts for the cumulative scenario 1 were assessed under both unmitigated neutral and adverse meteorological conditions. However, due to limited assessment information in the SIMTA EIS, the impacts of cumulative scenarios 2 and 3 were only assessed for neutral conditions as information on adverse metrological conditions was not available.

As with the air quality assessment, the noise and vibration assessment includes consideration of the SIMTA development in conjunction with the three rail access options and associated layouts for the Moorebank IMT.

Social impact assessment during operation

The assessment of cumulative social impact comprised a review of the SIMTA EA and a qualitative review of the cumulative impacts of the Project with the SIMTA development. This review took a holistic approach that considered the overall operational social impacts including an assessment of positive impacts such as employment generation.

Biodiversity

In relation to impacts on biodiversity, all three cumulative scenarios would potentially result in the loss of vegetation. Vegetation clearing on both the Moorebank IMT site and the SIMTA site would have the same impact across all three cumulative scenarios, the only difference relates to the impacts associated with the use of the northern rail access option (cumulative scenario 1) and the southern rail access option (cumulative scenarios 2 and 3). These impacts are presented in section 27.2.2.

Heritage

The cumulative Aboriginal and European impacts have been assessed by considering the combined impact of development on the Project site with the SIMTA development (i.e. disturbance area). The results of this assessment are presented in section 27.2.2.

Other planned developments in the locality

As well as the proposed SIMTA development, other planned developments in the locality of the Project that may have the potential for cumulative impacts were identified through ongoing consultations with Government agencies and a review of the NSW DP&E major projects website, http://www.planning.nsw.gov.au/, accessed on 11 June 2014 and 16 September 2014. Identified projects were limited to those with the potential for significant cumulative impacts when combined with the Project. These are assessed in section 27.2.3.

27.2 Impact assessment

27.2.1 Cumulative construction assessment

This section provides a qualitative review of the potential cumulative construction impacts that may arise from the combination of construction on the Project site and development on the SIMTA site. As discussed in section 27.1.5, as construction timing and phasing for a combined IMT precinct is not yet known, the cumulative construction considers the SIMTA development in accordance with the timing outlined in the SIMTA EIS.

For the purpose of this high level assessment, the proposed construction schedules of both projects were compared, with overlapping construction periods considered in this qualitative assessment. As discussed previously, in the absence of any detailed information on potential construction phasing for a combined IMT precinct, the proposed SIMTA Project construction schedule has been assumed to also represent development on the site for the purposes of the cumulative construction assessment works. The cumulative assessment also considers the impacts of approximately five years of continuous construction activity in the Moorebank area, from mid-2014 to mid-2019. Table 27.3 presents an overview of the proposed construction schedules for each project.

Table 27.3 Construction stages for each project (based on available public information)

Moorebank IMT Project phase and timing	SIMTA development stages and timing	Construction overlap
Early Works Mid 2015–end 2015	Stage 1 2014 – mid 2015	Overlap not expected as per current SIMTA schedule. However, it is recognised there may be partial overlap if there is a delay in the commencement of construction on the SIMTA site.
Phase A Late 2015–early 2018	Stage 2 Subject to demand – mid 2019	Assumed partial overlap
Phase B Mid 2023–mid 2025	Stage 3 Completion mid 2022	No overlap
Phase C Mid 2028–2030	N/A	No overlap

Using the information provided in Table 27.3, Figure 27.2 has been created showing the estimated span of activities, including any periods of overlapping construction.

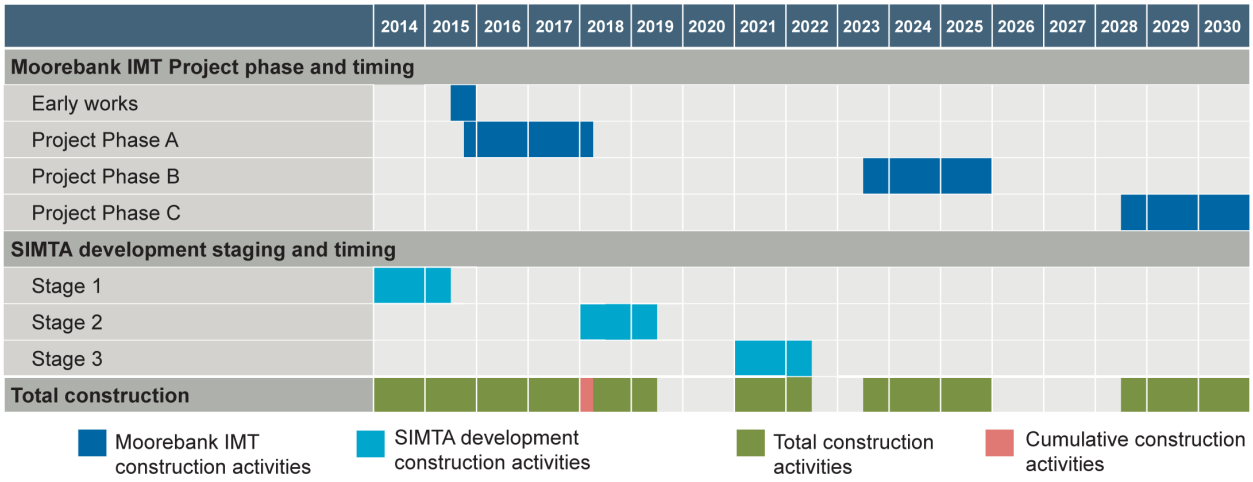


Figure 27.2 Cumulative construction schedules and overlaps

Construction summary

Figure 27.2 and Table 27.3 that the Project and the SIMTA development would overlap for a period of construction during 2018, coinciding with the Moorebank IMT Phase A and the SIMTA development construction Stage 2. There may also be a minor overlap during mid-2015 to the end of 2015 if there is a delay in the commencement of construction on the SIMTA site. This would involve the overlap of the Early Works development phase and Stage 1 of the SIMTA development.

The Early Works development phase involves relatively minor site preparation works and is the least significant phase of the Project in terms traffic volumes, earthworks, staff numbers and activities occurring on the site. No IMT construction activities would take place during the Early Works phase. Therefore, while there is potential for SIMTA Stage 1 to coincide with the Early Works phase, the cumulative impact is likely to be significantly less than would be the case for two coinciding construction phases.

Figure 27.2 shows that Stage 2 of the SIMTA development and Phase A of the Project would partially overlap. Stage 2 of the SIMTA development would involve construction of the central portion of the warehousing facilities as well as the circulation roads, staff and visitor parking, stormwater infrastructure and utility services and landscape treatments. While the most significant construction activities are likely to occur during Stage 2, this stage is expected to involve less impact on the environment than Stage 1. This is because Stage 2 predominantly involves the construction of warehousing on previously established hardstand (established as part of Stage 1).

In terms of the Moorebank IMT Project, the greatest level of construction activity would likely occur during Phases A and B. However, it is anticipated that by 2018 the majority of the key construction activities for Phase A would either be completed or nearing completion, ready for initial IMT operation in 2018. The peak for construction activities during Phase A is expected to be around 2016.

Accordingly, the most significant construction works during Phase A (i.e. 2016) and the SIMTA development (Stage 1) would likely take place at different times and therefore substantial cumulative construction impacts of the Project and the SIMTA development would be largely avoided. However, for the purposes of this assessment, a summary of the potential indicative effects of any cumulative construction works in the context of specific environmental issues is provided below:

Air quality

Phase A would involve some bulk earthworks that are likely to generate dust and particulate matter (PM), potentially causing air quality impacts. However, it should be noted that the majority of the bulk earthworks would likely to be completed or nearing completion by 2018, at the time when Phase A and the SIMTA development Stage 2 overlap.

Given that the SIMTA development Stage 2 construction does not involve any similar dust generating activities (i.e. the majority of the construction would occur on previously established hardstand), the cumulative dust impacts from the construction of Phase A and the SIMTA development Stage 2 are not likely to be significant.

In addition to dust and PM, air quality pollutants such as carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxide (NO_X) and sulfur dioxide (SO_2), would be generated by combustion engines associated with construction plant and vehicle emissions. The SIMTA EIS concludes that all construction emissions would be insignificant.

Given the magnitude of earthworks associated with the Early Works development phase, and the short term nature of the activities, the potential air emissions during Early Works are expected to be negligible. Therefore, the potential overlap of the Early Works development phase and Stage 1 of the SIMTA development is not likely to result an increase in impacts above those associated with Stage 1 SIMTA, to a magnitude which is more than minor.

Regional air quality

Construction air quality impacts are only measured on a local scale, as regional impacts from construction are negligible. Given that the bulk construction activities for the Project and the SIMTA development would be undertaken at different times, according to separate schedules that do not overlap, there is no potential for cumulative regional air quality impacts.

Noise

As noted above, the majority of the most significant construction works for the Moorebank IMT Project are expected to occur in the early to mid-stages of Phase A (i.e. 2016) as well as during Phase B. Therefore, the worst case noise conditions for the Project would not overlap with the worst case construction phase for the SIMTA development, which is expected to be in Stage 1. On this basis, the noise impacts generated during the overlapping construction of the Project and SIMTA development are likely to be minor.

In terms of the potential overlap of the Early Works development phase and the SIMTA development Stage 1, again the cumulative impacts of both Projects would not likely result in more than a minor increase above the levels already experienced for construction of Stage 1.

Traffic

Similarly, due to the reduced construction works at the end of Phase A, the cumulative traffic impacts on the local road network from the overlap of Phase A and SIMTA development Stage 2 are not likely to be significant. In addition, these impacts are likely to be less than the Project-only construction scenario during the peak stages of Phases A and B.

The majority of the road upgrade works associated with the Project would be undertaken during the early phases of Phase A, including the upgrade of Moorebank Avenue, north of the main IMT entry, the upgrade of the Anzac Road intersection and the Bapaume Road realignment. These works would be undertaken at a time that construction of the SIMTA development is not likely to be occurring. The intersection upgrades required to provide access to the SIMTA development (as further discussed in section 27.2.2) are likely to be undertaken during Stage 1, so that adequate access can be provided to the warehousing facilities and in the case of cumulative scenarios 2 and 3, the IMT facilities as well. This assumption is consistent with that made in the SIMTA EIS, which assumes that upgrades along Moorebank Avenue to provide entry to the site would be undertaken at the first stage of that project. Again, as shown in Figure 27.2, this does not overlap with the construction period for the Moorebank IMT Project.

The potential partial overlap of the Early Works and Stage 1 SIMTA development would again not likely result in more than minor increases in traffic movements above those already occurring for Stage 1. As recommended in section 11.5.3 of Chapter 11 – *Traffic, transport and access,* monitoring of traffic movements along Moorebank Avenue would be undertaken during peak periods to ensure that queuing at intersections does not impact on other road users (prior to the intersection upgrades to be undertaken during Phase A).

Biodiversity

The most significant impacts on biodiversity during the construction of the Project and the SIMTA development would result from vegetation clearing. Almost all of the vegetation clearing activities required for the development of the SIMTA development would occur during Stage 1.

Consideration of cumulative biodiversity impacts are suited to comparisons of the net area of cleared vegetation or number of ecological communities impacted over an entire development period. Section 27.2.2 provides detailed information on the total cumulative impacts resulting from vegetation clearing across the entire development of both projects.

27.2.2 Cumulative operation assessment

The following sections outline the likely impacts of the Project operating in combination with the SIMTA development, as per the three cumulative scenarios:

Traffic impacts

A daily trip generation rate was applied to the cumulative scenarios to obtain total daily trips for light and heavy vehicles. Light vehicle trip generation was assumed to be tidal during peak hours, i.e. all inbound in the AM peak and all outbound in the PM peak, and heavy vehicles were assumed to be evenly distributed between inbound and outbound movements. This is consistent with the assumptions used to calculate trips generated by the operation of the Moorebank IMT warehouses.

The calculated traffic generation forecast for each of the three cumulative scenarios is shown in Table 27.4.

Table 27.4 Cumulative scenario daily and peak hourly traffic generation

			Light vehicles	Heavy vehicles
Cumulative impact scenario 1	Total cumulative AM peak traffic movements	Inbound	275	205
		Outbound	0	205
	Total cumulative PM peak traffic movements	Inbound	0	205
		Outbound	275	205
	Total cumulative daily vehicle trips		**10,317**	**9,867**
Cumulative impact scenario 2	Total cumulative AM peak traffic movements	Inbound	445	168
		Outbound	0	168
	Total cumulative PM peak traffic movements	Inbound	0	154
		Outbound	563	154
	Total cumulative daily vehicle trips		**9,318**	**6,888**
Cumulative impact scenario 3	Total cumulative AM peak traffic movements	Inbound	875	176
		Outbound	0	176
	Total cumulative PM peak traffic movements	Inbound	0	152
		Outbound	812	152
	Total cumulative daily vehicle trips		**11,793**	**6,194**

For the purposes of this assessment, road access to the SIMTA site would be via three main intersections on Moorebank Avenue: the SIMTA northern road access, the SIMTA central road access and the SIMTA southern road access. These access points are shown in Figure 27.1. Based on the SIMTA Traffic and Transport Assessment prepared by Hyder Consulting, the northern and central accesses would be utilised by both light and heavy vehicle for ingress and egress and the southern access for heavy vehicle egress only.

A SIDRA intersection analysis was run to assess the three cumulative scenarios. The results of this analysis are presented in Table 27.5 and Table 27.6.

Table 27.5 Intersection performance – Cumulative scenario 1 (2030)

Scenario	AM peak				PM peak			
	DoS	Delay	LoS	Queue	DoS	Delay	LoS	Queue
Moorebank Avenue, Anzac Road and Bapaume Road								
Cumulative scenario 1	0.86	27	B	254	1.12	48	D	336
Moorebank Avenue, Warehouse Access 1 and SIMTA Northern Access								
Cumulative scenario 1	0.76	9	A	124	0.83	10	A	217
Moorebank Avenue, Warehouse Access 2 and SIMTA Central Access								
Cumulative Scenario 1	0.88	21	B	324	0.78	6	A	66
Moorebank Avenue and Warehouse Access 3								
Cumulative Scenario 1	0.79	12	A	226	0.76	8	A	197
Moorebank Avenue, MIMT Main Access and SIMTA Southern Access								
Cumulative Scenario 1	0.77	15	B	203	0.88	16	B	231

Table 27.6 Intersection performance – Cumulative scenario 2 and 3 (2030)

Scenario	AM peak				PM peak			
	DoS	Delay	LoS	Queue	DoS	Delay	LoS	Queue
Moorebank Avenue, Anzac Road and Bapaume Road								
Cumulative scenario 2	0.98	34	C	266	1.20	53	D	379
Cumulative scenario 3	1.48	114	F	598	1.21	52	D	389
Moorebank Avenue, DNSDC Access and SIMTA Northern Access								
Cumulative scenario 2	0.64	4	A	111	0.87	11	A	192
Cumulative scenario 3	0.77	6	A	201	0.94	24	B	390
Moorebank Avenue, MIMT Main Access and SIMTA Central Access								
Cumulative scenario 2	0.72	9	A	128	0.81	14	A	187
Cumulative scenario 3	0.70	8	A	110	0.92	32	C	374
Moorebank Avenue and Warehouse Access 1								
Cumulative scenario 2	0.71	4	A	104	0.67	2	A	22
Cumulative scenario 3	0.72	4	A	107	0.66	2	A	22
Moorebank Avenue, Warehouse Access 2 and SIMTA Southern Access								
Cumulative scenario 2	0.73	6	A	135	0.70	3	A	27
Cumulative scenario 3	0.73	6	A	132	0.69	3	A	32
Moorebank Avenue and Warehouse Access 3								
Cumulative scenario 2	0.68	11	A	182	0.69	6	A	52
Cumulative scenario 3	0.67	9	A	179	0.71	5	A	44

Notes: DoS = Degree of Saturation; LoS = Level of Service; Max queue length is usually quoted as the 95th percentile back of queue, which is the value below which 95% of all observed queue lengths fall. It reflects the number of vehicles per traffic lane at the start of the green period, when traffic starts moving again after a red signal. The intersection queue length is usually taken from the movement with the longest queue length.

The intersection analysis predicts that during peak periods of commuting pressure on the road network, all intersections would experience an increase in DoS and delay times. However, all intersections would still operate with a satisfactory LoS of C or better, except the intersection of Moorebank Avenue and Anzac Road.

The intersection of Moorebank Avenue and Anzac Avenue is the only intersection that would operate at capacity and in the case of cumulative scenario 3, the LoS would be unsatisfactory (LoS F) during the AM peak hour. The intersection would experience long delay from this intersection under cumulative scenario 3 and queues would interrupt the operation of the intersection of Moorebank Avenue and the M5 Motorway.

Based on these results, no further upgrades beyond that already proposed as part of the Project are required for cumulative scenario 1 or 2. However, intersection upgrades for the Moorebank Avenue/ Anzac Road/Bapaume Road intersection would be required to mitigate the impacts of cumulative scenario 3. These are discussed in section 27.3.

An assessment of the impact on the wider road network has also been undertaken, and the results are provided in section 7.4 of Technical Paper 1 – *Traffic and Transport Impact Assessment* in Volume 3. A summary of the results from the M5 Motorway and Hume Highway interchange and the Cambridge Avenue and Canterbury Road Interchange are presented in Table 27.7. The results suggest the combined development of the Project site and the SIMTA site under all three scenarios is not likely to have a substantial impact on operations of the M5 Motorway or Cambridge Avenue.

Table 27.7 Cumulative scenarios intersection performance on wider road network in 2030

Scenario	AM peak				PM peak			
	DoS	Delay	LoS	Queue	DoS	Delay	LoS	Queue
I-14 M5 Motorway and Hume Highway								
2030 Future Background	1.21	81	F	1101	1.15	79	F	641
Cumulative Scenario 1	1.30	93	F	1109	1.27	95	F	670
Cumulative Scenario 2	1.29	92	F	1109	1.28	99	F	706
Cumulative Scenario 3	1.29	93	F	1109	1.30	105	F	738
I-15 Cambridge Avenue and Canterbury Road								
2030 Future Background	1.14	114	F	287	0.59	14	A	28
Cumulative Scenario 1	1.33	194	F	443	0.62	14	A	29
Cumulative Scenario 2	1.48	478	F	957	0.65	14	A	30
Cumulative Scenario 3	1.87	441	F	756	0.68	15	B	32

Air quality impacts

The assessment of the cumulative air quality impacts includes both incremental and background cumulative impacts resulting from the Project and SIMTA development, whereby:

- incremental impacts refer to the predicted impact of the 'Project and SIMTA development only (i.e. cumulative scenarios only)' under future scenarios; and
- background cumulative impacts refer to the predicted impact from the Project and SIMTA site (i.e. cumulative scenarios) and existing immediately surrounding developments in the future (i.e. baseline air quality).

Receiver locations are shown on Figure 17.2 in Chapter 17 – *Local air quality*. The criteria used to assess the cumulative impacts were based on the NSW Environment Protection Authority (EPA) assessment criterion and *National Environment Protection Measure (Ambient Air Quality) 1998* (NEPM) (referred to as the Project assessment criteria).

The SIMTA EIS only assessed particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$) and nitrogen dioxide (NO_2) concentrations. Therefore, the cumulative modelling scenarios only give attention to these pollutants.

Cumulative scenario 1

Air pollutant concentrations from the two operations (projects only, not considering background air quality) are predicted to be within the NSW EPA criteria and NEPM advisory reporting goals. However, the following exceedances were predicted to occur due to background cumulative concentrations and existing air quality:

- one additional exceedance of the 24-hour average PM_{10} assessment criterion at R33;
- five additional exceedances of the 24-hour average $PM_{2.5}$ advisory reporting goal at R33; and
- exceedance of the annual average $PM_{2.5}$ advisory reporting goal at R33.

Importantly, the peak ambient concentrations at this location are already above the goals due to the influence of extensive bushfire activity in late 2013.

No other exceedances were predicted across the remaining sensitive receptors for all pollutants assessed.

Cumulative scenario 2

As with cumulative scenario 1, air pollutant emissions from the two projects are predicted to be within the NSW EPA and NEPM criteria. However, taking into account the air quality of the surrounding area, the following criteria exceedances were predicted to occur:

- one additional exceedance of the 24-hour average PM_{10} assessment criterion at R33;
- four additional exceedances of the 24-hour average $PM_{2.5}$ advisory reporting goal at R33; and
- exceedance of the annual average $PM_{2.5}$ advisory reporting goal at R33.

As noted above, the peak ambient concentrations at this location are already above the goals due to the influence of extensive bushfire activity in late 2013.

No other exceedances were predicted across the remaining sensitive receptors.

Cumulative scenario 3

Again, air pollutant emissions from the two projects are predicted to meet the relevant assessment criteria. However, the following exceedances were predicted when taking into account the background cumulative impacts of the local air quality:

- three additional exceedances of the 24-hour average $PM_{2.5}$ advisory reporting goal at R33; and
- exceedance of the annual average $PM_{2.5}$ advisory reporting goal at R33.

As noted above, however, the peak ambient concentrations at this location are already above the goals due to the influence of extensive bushfire activity in late 2013. No other exceedances were predicted across the remaining sensitive receptors.

Summary

The incremental (i.e. the Project and the SIMTA development only, without reference to background air quality) air pollutant concentrations and dust deposition rates associated with IMT layouts and rail access were predicted to be within NSW EPA and NEPM criteria for each of the three cumulative scenarios.

However, when taking into account the background air quality, the cumulative concentrations showed additional infrequent (5 days a year in the worst case) predicted exceedance of the NSW EPA 24-hour $PM_{2.5}$ criterion at the closest receptor to the Project site boundary (receptor R33), which is the current location of the Department of Defence (Defence) National Storage Distribution Centre (DNSDC) and is in the process of being relocated. Exceedances occurred for each cumulative scenario, however, the peak ambient concentrations at this site are already above the goals due to the influence of extensive bushfire activity in late 2013. Figure 27.3 below, shows the contribution to annual average $PM_{2.5}$ concentrations at Receptor 33 for the cumulative Moorebank IMT and SIMTA scenarios.

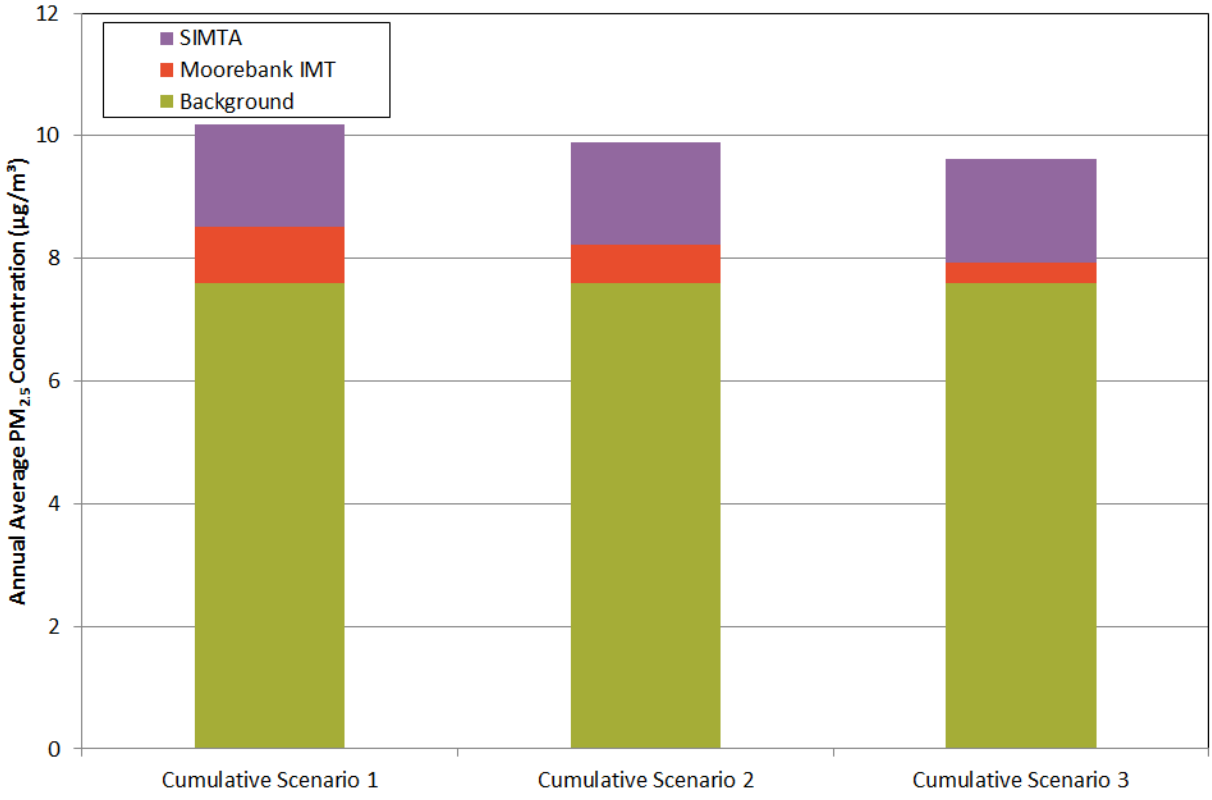


Figure 27.3 Contribution to annual average $PM_{2.5}$ concentrations at Receptor R33 – Cumulative Moorebank IMT and SIMTA scenarios

Receptor R33 (the DNSDC) is currently being relocated to a brownfield site directly west of the existing DNSDC site, at location R35. Therefore, should the SIMTA development proceed, R33 would not represent a sensitive receptor. No additional exceedances of air pollutants were recorded at receptor R35 as a result of the Project and the SIMTA development.

In addition, as discussed in the Technical Paper 7 – *Local Air Quality Impact Assessment* in Volume 6, the background levels are already exceeded for PM_{10} and $PM_{2.5}$ even without the Project. With the exception of 24-hour average concentration predictions for receptor R33, no additional exceedances above those already occurring as a result of background air levels would occur as a result of cumulative operational emissions from the Project site and the adjacent SIMTA site.

For the reasons explained above, overall the likelihood of adverse impacts arising under the all three scenarios is very low.

Noise impacts

The cumulative noise impacts for the Project and the SIMTA development have been assessed against the amenity noise criteria, which are based on the NSW *Industrial Noise Policy* (INP) (EPA 2000b). Table 27.8 below outline the amenity noise criteria for residences during the cumulative operation of the Project and SIMTA warehousing development.

Table 27.8 Cumulative assessment – amenity noise criteria

Land use	Period	Acceptable Noise Level dB(A) L_{Aeq}	Maximum Noise Level dB(A) L_{Aeq}
Residential – daytime	Monday to Saturday Sundays & Public Holidays	55	60
Residential – evening	6.00 pm–10.00 pm	45	50
Residential – night-time	10.00 pm–7.00 am	40	45
School classrooms	When in use	35 (internal)	40 (internal)
Places of worship	When in use	40 (internal)	45 (internal)
Passive recreation areas	When in use	50	55
Active recreation areas	When in use	55	60
Commercial premises	When in use	65	70
Industrial premises	When in use	70	75

Note: All noise levels in dB(A) to nearest decibel
L_{Aeq}= equivalent continuous (energy average) A-weighted sound pressure level

Cumulative scenario 1

Using the Project's worst case noise levels from the Full Build 2030 scenario and the noise levels modelled from the SIMTA warehousing scenario, the noise levels predicted to be experienced during neutral and adverse metrological conditions at a number of sensitive receivers were determined, as shown in Table 27.9.

Table 27.9 Cumulative scenario 1 assessment – predicted cumulative operational noise levels

Receptor	Predicted noise levels, L_{Aeq}, dB(A)	
	Neutral meteorological conditions	Adverse meteorological conditions
Casula	37–**48**	36–**49**
Wattle Grove	34–40	40–**45**
Glenfield	32–36	31–35
Non-residential noise sensitive receptors	24–50	24–51

Note: All noise levels in dB(A) to nearest decibel
L_{Aeq}= equivalent continuous (energy average) A-weighted sound pressure level

Bold highlight denotes predicted noise level exceeds the Project specific noise level criterion.

Under neutral meteorological conditions the unmitigated noise levels at Glenfield and Wattle Grove are predicted to comply with the INP amenity noise criteria. However, at Casula, during neutral metrological conditions the predicted levels exceed the evening noise criterion by 3 dB(A) and the night-time noise criteria by 8 dB(A). The numbers highlighted in bold in Table 27.9 show the predicted noise levels that exceed the Project specific noise level criteria, as identified in Table 27.8.

Under adverse metrological conditions, the unmitigated noise levels exceed the noise criterion at Casula during the evening and night time (exceedance of 4 dB(A) and 9 dB(A) respectively). At receptors at Wattle Grove the predicted noise levels exceed the night-time noise criterion by 5 dB(A), but comply with the daytime and evening criteria.

Noise levels at the non-residential noise sensitive receptors comply with the amenity noise criteria.

To comply with the INP noise criteria, noise mitigation may be required at both the Moorebank IMT and the SIMTA site. This is discussed further in section 27.3.

Cumulative scenario 2

The predicted cumulative noise levels for cumulative scenario 2 are shown in Table 27.10.

Table 27.10 Cumulative scenario 2 assessment – predicted cumulative operational noise levels

Receptor	**Predicted noise levels, L_{Aeq}, dB(A)**
	Neutral meteorological conditions
Casula	35–**47**
Wattle Grove	30–38
Glenfield	30–32
Non-residential noise sensitive receptors	23–49

Note: All noise levels in dB(A) to nearest decibel
L_{Aeq}= equivalent continuous (energy average) A-weighted sound pressure level

Bold highlight denotes predicted noise level exceeds the Project specific noise level criterion.

Under neutral metrological conditions unmitigated noise levels at Wattle Grove and Glenfield are predicted to comply with the adopted INP amenity noise criteria. At Casula the predicted unmitigated noise levels are predicted to marginally exceed the 45 dB(A) L_{Aeq} evening noise criterion by up to 2 dB(A) and exceed the 40 dB(A) L_{Aeq} night-time noise criterion by up to 7 dB(A).

Due to limited assessment information in the SIMTA EIS, cumulative scenario 2 under adverse metrological conditions could not be assessed.

Noise levels at the non-residential noise sensitive receptors comply with the amenity noise criteria.

To comply with the noise criteria, noise mitigation may be required at both the Moorebank IMT and the SIMTA site. This is discussed further in section 27.3.

Cumulative scenario 3

The predicted cumulative noise levels for the cumulative scenario 3 are shown in Table 27.11.

Table 27.11 Cumulative scenario 3 assessment – predicted cumulative operational noise levels

Receptor	Predicted noise levels, L_{Aeq}, dB(A)
	Neutral meteorological conditions
Casula	38–**50**
Wattle Grove	33–**41**
Glenfield	33–35
Non-residential noise sensitive receptors	26–52

Cumulative noise levels at Glenfield are predicted to comply with the adopted INP amenity noise criteria. At Wattle Grove predicted unmitigated noise levels comply with the daytime and evening noise criteria but marginally exceed the 40 dB(A) L_{Aeq} night-time noise criterion by 1 dB(A). At Casula the predicted unmitigated noise levels comply with the daytime noise criterion but exceed the 45 dB(A) L_{Aeq} evening noise criterion by up to 5 dB(A) and exceed the 40 dB(A) L_{Aeq} night-time noise criterion by up to 10 dB(A).

Due to limited assessment information in the SIMTA EIS, the cumulative scenario 3 adverse metrological conditions could not be assessed.

Noise levels at the non-residential noise sensitive receptors comply with the amenity noise criteria.

Sleep disturbance

Section 12.3.6 of Chapter 12 – *Noise and vibration* provides an assessment of the Project in terms of sleep disturbance. Overall, noise emissions from the main IMT site are not likely to result in sleep disturbance at the nearby receivers at Casula, Wattle Grove and Glenfield (based on the sleep disturbance objectives of 47 dB(A) L_{Amax} at Casula and 48 dB(A) L_{Amax} at Wattle Grove and Glenfield). However, operation of the northern rail access option may result in the nearest receptors at Casula experiencing some sleep disturbance. As such, cumulative scenario 1, which uses the northern rail access option, has the potential to cause sleep disturbance.

A more detailed assessment of sleep disturbance would be undertaken during the detailed design of the cumulative operations.

Traffic noise impacts

During the Full Build operation of the cumulative scenarios, the road traffic noise levels on Moorebank Avenue may exceed the daytime and night-time noise criteria for all three cumulative scenarios, but this exceedance would only be marginal, (less than 2 dB(A)). As such, noise mitigation to reduce road traffic noise levels from Moorebank Avenue is not likely to be required.

Notwithstanding this, a detailed cumulative assessment should be undertaken during detailed design and during the Stage 2 SSD approval(s) process.

Biodiversity impacts

All three cumulative scenarios have the potential to result in loss of vegetation. The impacts of development on both the Moorebank IMT site and the SIMTA site remain the same across all three cumulative scenarios, the only difference being the use of the northern rail access option (cumulative scenario 1) or the southern rail access option (cumulative scenario 2 and 3). The potential loss of vegetation for all three scenarios is shown in Table 27.12.

Table 27.12 Cumulative potential loss of vegetation

Vegetation community/habitat type	Threatened Ecological Community Conservation Status		Vegetation clearing (ha)		Cumulative total (ha)	Extent of vegetation within region (ha)[3]
	TSC Act[1]	EPBC Act[2]	Moorebank IMT	SIMTA IMT		
Vegetation						
Castlereagh Swamp Woodland	Endangered	-	0.9	4.37	5.27	616
Castlereagh Scribbly Gum Woodland	Vulnerable	-	16.1	18.93	35.03	3083
Riparian Forest (River-Flat Eucalypt Forest)	Endangered	-	2.2–5.3	7.23	34.63-42.93	717
Alluvial woodland (River-Flat Eucalypt Forest)	Endangered	-	25.2–30.4			4698
Freshwater Wetlands	Endangered	-	-	0.66	0.66	664
Total area			**44.4–52.7**	**31.19**	**75.59–83.89**	

As shown in Table 27.12 the cumulative effect of development on both sites will result in the removal of approximately 75–84 ha of vegetation. The cumulative impact of both developments would be an additive effect on processes that increase the likelihood of extinction of threatened biodiversity. However, no population of any species of local occurrence of any ecological communities known or likely to be present on the Project site is considered likely to be on the verge of meeting a critical threshold for habitat loss or degradation. Any increase in the cumulative impact of both the Project and the SIMTA development would require corresponding increase in the provision of suitable offsets.

Heritage

Aboriginal and European heritage assessments have been prepared for the Project site and the SIMTA site. In terms of the cumulative impacts on European heritage, a worst case scenario is assumed where all heritage buildings on both sites would be demolished, or if possible, relocated. European heritage impacts are similar across all three cumulative scenarios and these are presented in Table 27.13.

Aboriginal heritage values are difficult to quantify as further investigations are required on the SIMTA site to confirm the value of potential archaeological deposits (PAD). Therefore, the cumulative impact on the subsurface archaeological resource across both sites cannot be fully determined. However, a preliminary assessment of the potential Aboriginal heritage values is provided in the Table 27.13.

Social impacts

The long-term simultaneous operation of both the Project and the SIMTA development would result in a number of local and regional social impacts that can be considered both positive and negative.

If both projects were to proceed, this would result in significant employment generation for the region, with an additional 3,644 positions, 3,568 positions and 4,058 positions created by both projects combined for cumulative scenarios 1, 2 and 3 respectively. This would have positive social and economic impacts for individuals and the local community with the inflow of more employment opportunities.

The cumulative increase in employment opportunities may create demographic changes within the local community. These changes are likely to be greater than would be experienced by the Project operation alone. In the short term, the combined construction workforce of both projects may have a larger impact on local rental availability due to an increase in workers wanting to temporarily relocate to the local area. This may also result in long-term effects on housing availability and pricing.

In terms of amenity impacts, it is expected that the traffic volumes on Moorebank Avenue would increase as a result of both projects operating simultaneously. The intersection of Moorebank Avenue and Anzac Road would be upgraded as part of the Project and the cumulative impact of scenarios 1 or 2 would not necessitate any additional mitigation to relieve congestion at this intersection. However, in the case of scenario 3, intersection upgrades would be required to mitigate the impacts of the additional traffic.

It is not anticipated that the simultaneous operation of both projects would result in a significant increase in visual impacts above those already likely to be generated by the Project. These impacts are discussed further in Table 27.13.

The cumulative air quality and noise impacts have been discussed above. The operation of both projects is likely to result in an increase in air and noise emissions above those expected as a result of the Project alone. This is likely to have an impact on the amenity of the surrounding residents. Mitigation measures as outlined in section 27.3 would need to be employed to minimise these impacts.

Other impacts

The cumulative impacts of the Project and SIMTA development are briefly summarised in Table 27.13 for a number of other environmental issues. Where suitable, information from the SIMTA EA and SIMTA EIS has been adopted to form a general assessment of other cumulative impacts resulting from the development of the proposed SIMTA development. As the SIMTA EA and SIMTA EIS assessed a number of issues at a highly conceptual level, it is not possible to make detailed comparisons of other environmental issues between the Project and SIMTA project. Therefore, these issues have been assessed qualitatively in Table 27.13 and all scenarios have been considered jointly.

Should the potential SIMTA development and the Project progress to detailed design, additional assessment would be undertaken to further understand the cumulative impacts of both projects.

27.2.3 Assessment of other planned developments

A number of key transport and urban development projects are proposed within the surrounding region. Table 27.14 shows a number of other major developments that have been considered during the development of this EIS.

In addition, the SSFL, which is a dedicated freight line that forms part of the Main South Rail Line corridor to the west of the Project, commenced operation in January 2013. The SSFL plays an important role supporting the development of the Project in that it provides a rail connection from Port Botany to the Project site. As construction of the SSFL has been completed, there would be no cumulative impacts with the Project during construction. Air and noise emissions from the SFFL have been accounted for in the background calculations of the air and noise assessments in this EIS.

Table 27.13 Cumulative assessment of other environmental issues (all cumulative scenarios)

Issue	Project impact	SIMTA development impact	Cumulative impact
Aboriginal heritage	Up to 10 recorded Aboriginal sites are predicted to be directly affected by the development of the Project (depending on which rail access option is pursued). As a result of the Project these sites may be fully or partially destroyed. Importantly, however, the areas of highest Aboriginal heritage sensitivity on the Project site would be largely conserved. The Project would affect less than a quarter of the Tertiary terraces within the Project site that are identified as being archaeologically sensitive.	Aboriginal heritage items on the SIMTA site that may potentially be affected by development on the site include one Aboriginal PAD and five Aboriginal isolated artefacts.	The scientific significance of the PAD on the SIMTA site is yet to be assessed through sub-surface testing, so the precise cumulative impact of the archaeological resource across both sites cannot be fully determined. However, overall it is anticipated that there would be a low to moderate increase in the Aboriginal heritage impacts, when compared with the Project alone.
European heritage	A total of 17 European heritage sites have been identified as meeting the thresholds of local, state and/or national heritage. It is anticipated that all of these items will be directly affected by a result of the Project, as they fall within the footprint. Mitigations such as salvage of archaeological deposits, archival recording, relocation and adaptive use would be considered further in the detailed design of the Project, as outlined in Chapter 21 – *European heritage.*	The existing DNSDC site is listed on the Commonwealth Heritage List as containing 18 buildings dating back to World War II that are considered highly significant. The development of the SIMTA warehousing development will have a significant impact on these 18 heritage buildings, including their demolition and removal in some cases. Some of these impacts would be mitigated through conservation and relocation of some heritage items.	There would be greater collective impact on European heritage resulting from the loss of WWII buildings on the SIMTA site. Impact on European heritage will further compound the rarity and representativeness of any remaining heritage items both within the Project site and the wider landscape. The change in land use at the Moorebank IMT combined with the relocation of the DNSDC currently underway, would compound the overall loss of connection with former Defence uses across the Moorebank precinct.

Issue	Project impact	SIMTA development impact	Cumulative impact
Human health	The construction and operation of the Project has the potential to contribute to a number of human health issues. Potential health effects, both adverse or beneficial, could arise directly or indirectly as a result of other impacts associated with the Project, such as changes in: • traffic volumes; • noise levels; • ecosystem health or functioning (e.g. contamination of land or water resources); • air quality; • visual amenity; • lifestyle (e.g. recreation opportunities); • property values; and/or • economic or employment status. It should be noted, however, that potential health issues associated with changes in traffic, noise and air quality are of key concern. Potential health issues associated with the above impacts include changes in mood, stress or anxiety levels; gastrointestinal, cardiovascular or respiratory issues; or illness and injury. However, issues associated with key impacts (traffic, noise and air quality impacts) were a key focus of the human health risks and impact assessment. Potential beneficial impacts include improvements in socioeconomic status and health (e.g. through an increase in employment and income opportunities).	The SIMTA development is likely to involve construction and development activities that may generate similar or comparable human health risks and impacts to those generated by the Project (particularly in terms of changes in traffic and noise levels and air quality).	Should both the SIMTA development and the Project proceed, then the likelihood and significance of potential cumulative health risks to the community may increase, particularly for health issues associated with impacts of key concern (traffic and noise levels and air quality). Such issues include stress and anxiety, sleep disturbance, annoyance, impacts on concentration, memory, and performance, and exacerbation of existing respiratory (e.g. asthma) and cardiovascular disease. Potential beneficial effects could also arise in relation to increases in employment and income opportunities. Technical Paper 15 – *Human Health Risk Assessment* in Volume 9 discusses the cumulative human health impacts. Overall, the predicted health impacts for all three cumulative scenarios are considered to be low (not significant). While there will be an exceedance of air quality advisory reporting goals for receptor R33, this receptor is located within the SIMTA site and the SIMTA emissions would be the notable contributor to emissions at this location. It is therefore not appropriate to consider location R33 as a 'receptor' for the purposes of the cumulative impact assessment. Further details of the environmental and socioeconomic impacts contributing to potential health issues, cumulative or otherwise, as well as proposed mitigation measures (and residual impacts), are required to be undertaken through a more detailed assessment of potential health issues.

Issue	Project impact	SIMTA development impact	Cumulative impact
Hazards and risks	Hazards associated with the Project include: • the transport, storage and use of liquid natural gas (LNG) and liquid petroleum gas (LPG) and natural gas pipeline; • the potential transport, storage and handling of other flammable liquids and combustible liquids; and • bushfire.	The key potential hazards and risks that would be associated with the SIMTA development are: • the potential transport, storage and handling of other flammable liquids and combustible liquids; and • bushfire.	It is unlikely that the development and operation of the two projects would have a cumulative impact in terms of hazards and risks. Hazardous materials, dangerous goods and bushfires would be handled and controlled locally at each site in accordance with appropriate management plans.
Hydrology	Potential localised flooding impacts have largely been mitigated through drainage design. Potential flooding impacts may occur during the construction of the Georges River bridge crossing. These impacts can be minimised through appropriate staging of the temporary works and the employment of a flood emergency plan. The operation of the bridge crossing shows that there will be an increase in flooding as result of the operation of the bridge structure; however, the predicted increases in flood level would not translate to a significant increase in flood extent, as the flow would be confined within a relatively steep-sided valley.	Flooding impacts from the SIMTA development are anticipated to be small, with flood level increases limited to a 10 mm impact on the 100-year average recurrence interval (ARI) 9-hour event. Some increases in runoff entering the neighbouring Anzac Creek and the Project site would occur.	Due to insufficient information available regarding the impacts, design and management of surface water flows and infrastructure on the SIMTA proposal, cumulative hydrological impacts cannot be understood in detail at this stage. However, any design for the site would be required to provide flood attenuation that would ensure no net increase in flood flows on the Project site. A detailed hydrological impact assessment of the SIMTA project is required.
Greenhouse gases (GHG)	The Project would generate Scope 1 and Scope 2 emissions of: • 74,939 carbon dioxide equivalent (CO_2-e) throughout the entire construction; and • 150,743 t CO_2-e a year from the operation of the Project (2030).	It is anticipated that the potential SIMTA development would generate similar or, in the case of scenario 1, significantly fewer GHG emissions than the Project.	The cumulative GHG impacts of both the Project and the SIMTA development would be experienced during the simultaneous operation of both projects. However, the cumulative annual emissions would likely represent a very small proportion of the 2009–2010 NSW GHG emissions. A more detailed assessment of these emissions would be undertaken if required during the Stage 2 SSD approval(s) process.

Issue	Project impact	SIMTA development impact	Cumulative impact
Visual	The Project would result in the development of significant infrastructure that would be visible to some residents and road and rail users. The greatest visual impacts that are likely to be generated from the Project are from residential and public areas to the west of the Project site. These impacts are moderate, given that even with substantial vegetation screening, there would be areas where the rail access and onsite gantries would be visible. Visual impacts to the east of the Project site are likely to be low, given that the area is already an industrial environment.	Potential visual impacts arising from the SIMTA development are considered to be relatively low, having regard to the existing DNSDC industrial buildings and proposed mitigation measures including screening described in the SIMTA EA. The proposed development would be in keeping with the existing character of the area. Some structures/equipment may increase the visibility of the site beyond its current levels. The most prominent views would occur at localised boundary points such as Moorebank Avenue and Anzac Road, as well as the residential boundary to Wattle Grove. However, these impacts are regarded as relatively low because of the existing views of the DNSDC operations.	As a result of the development and operation of the Project and SIMTA development, visual impacts would increase. However, given that the Project would predominantly affect visual receivers to the west of the Georges River, while the SIMTA development would predominantly impact the visual environment and visual receivers to the east of the Project site, the total cumulative impacts from these projects are not considered to be significant.
Regional air quality	The Project as a whole would have an insignificant impact on regional air quality in Sydney. The Project is expected to slightly increase impacts along roads near Moorebank and the western part of the rail corridor from Port Botany to Moorebank; however, these changes are small and unlikely to be discernible in a regional context.	The operation of the SIMTA development is expected to have a minor or negligible overall impact on regional air quality, given the scale of the project in the regional context.	Given that both the SIMTA development and the Project are predicted to have a minor or negligible impact on overall regional air quality, it is expected that any cumulative impacts would be minor or negligible. Based on the regional air assessment undertaken in Chapter 18 – *Regional air quality*, the local air assessment was found to be the most informative measure of cumulative air impacts. Refer to the cumulative local air quality assessment in section 27.2.2 above.
Waste and resource management	The construction and operation of the Project would result in the generation of substantial wastes including a range of: • solid wastes; and • effluent, sewage, wastewater and trade wastes. It would also use substantial resources.	The SIMTA development would generate a range of wastes including: • solid wastes (construction); and • effluent, sewage, wastewater and trade wastes. It would also use substantial resources.	Both projects would have a cumulative effect on the generation of wastes. Hazardous materials would likely be handled and controlled locally at each site in accordance with appropriate management plans. However, the opportunity may arise to establish a combined waste management system to reduce waste generation and optimise waste management.

Table 27.14 Other planned developments in the local area

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
M5 Motorway West Widening Project	Interlink Roads is well advanced with a project to widen around 20 km of the M5 South West Motorway between King Georges Road, Beverly Hills and Camden Valley Way, Casula.	The M5 Motorway Widening Project involves widening of the M5 Motorway from two to three lanes in each direction for the majority of its length. The M5 Motorway would be heavily utilised by Project-related traffic.	Interlink Roads anticipates that the project will be completed in late 2014. There would therefore be no cumulative construction impacts. Operational cumulative impacts would be positive as the project would enhance capacity of the M5 Motorway.	Some construction impacts on local air quality and water catchment may be experienced. However, no long term impacts are anticipated once the M5 Motorway Widening Project is completed.
Moorebank Units Relocation (MUR) Project	Defence is relocating the existing School of Military Engineer (SME) functions and infrastructure to a new site within the Holsworthy Barracks. The new site is located in a brownfield area of the Holsworthy Barracks.	The MUR Project will remove some elements of the SME from within the Project site. While the MUR Project is necessitated by the Project, the MUR Project is subject to a separate approval process and was not considered to be a controlled action under the EPBC Act.	The MUR Project commenced in 2012 and is expected to be completed by mid-2015, before construction of the Project. Therefore, there would be minimal cumulative construction impacts from the MUR Project and the Project.	During the demolition of infrastructure and relocation from the Project site, impacts on local air quality and water catchments are likely to be minimal. Any such impacts would be controlled through appropriate environmental management. Potential impacts on human health could arise if hazardous materials are discovered or disturbed during the relocation of existing infrastructure.
DNSDC relocation as part of the Defence Logistics Transformation Program (DLTP)	Defence under the Defence Logistics Transformation Program (DLTP) is relocating the existing DNSDC functions (at the SIMTA project site) and infrastructure to a new brownfield site directly west of the existing DNSDC at West Wattle Grove.	The relocation of the DNSDC would occur on the lands directly adjacent to the Project site. Should the relocation works be undertaken during the construction of the Project, there is potential for a number of cumulative amenity impacts to occur, such as additional traffic, noise and air quality impacts. However, it is expected that the DNSDC operations would be relocated before the start of the Project. As the proposed new DNSDC site is a brownfield site that is largely unvegetated with no built heritage, neither biodiversity nor heritage impacts are considered to be significant.	The DLTP is under way, and construction on the new site is scheduled to be completed by late 2014.	Impacts on local air quality and water catchments may arise from the removal of existing infrastructure; however, these would be minimal and would be controlled through appropriate environmental management. Potential impacts on human health could arise if hazardous materials are discovered or disturbed during the relocation of existing infrastructure.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
South West Rail Link	TfNSW is currently constructing a heavy passenger rail line from Glenfield to Leppington via Edmondson Park, along with associated infrastructure including stations, train stabling, roadways, car parks, bus interchanges and public amenities.	The South West Rail Link does not directly affect the Project. Cumulative impacts during construction are unlikely, given the distance between the sites.	Glenfield to Leppington Rail Line commenced construction at the beginning of 2012 and is scheduled to commence services in 2015.	Construction activities may result in some impacts on local air quality and pollution of local water courses. However, these would be managed through appropriate mitigation and are not expected to significantly affect the local air or water quality. Likewise, human health impacts are unlikely to result from these construction activities.
South West Growth Centre	The South West Growth Centre comprises 18 precincts within the Liverpool, Camden and Campbelltown LGAs in Western Sydney. This growth area has the capacity for approximately 110,000 new dwellings for 300,000 people and would provide land for employment.	The South West Growth Centre will accommodate for new residential dwellings and employment areas. The Project would also provide employment opportunities for that growth area, as well as assisting with the growth in demand for containerised freight for that growth area.	New precinct areas will be released over the next few years.	The development of south-west Sydney, including the South West Growth Centre, is likely to see an increase in road congestion and VKT within the south west regional area. This in turn is likely to contribute to an increase in emissions from vehicles. It could therefore be anticipated that, as a result of the South West Growth Centre, some air quality impacts may be experienced within the local airshed. These are difficult to quantify as the planning to date for the Growth Centre has not included a strategic air quality assessment. The development of the South West Growth Centre will involve converting a number of natural land areas into hardstand (buildings, roads and infrastructure). As a result it is expected that stormwater runoff to nearby water courses would be increased. It is also likely that, due to the change in land use from rural to urban activity, receiving water bodies would experience an increase in pollutant and sediment loads. The extent of pollution and overall impact of this development is unknown.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
Glenfield Waste Services Materials Recycling Facility	Glenfield Waste Services (GWS) is proposing to develop a Materials Recycling Facility at the Glenfield Landfill, directly west of the Georges River. The facility is proposed to recycle a maximum of 450,000 tonnes of material a year.	The proposed location for the Materials Recycling Facility is within the existing Glenfield Landfill site, south of the Project site. The Project does not have an impact on land identified for the materials waste facility.	NSW SEARs were issued to the proponent (L.A Kennett Enterprises Pty Ltd) on 19 December 2013. No timing details have been provided for the project to date.	Construction and operation of the Materials Recycling Facility may have impacts on air quality (dust and odour emissions), noise, hydrology, traffic and access, visual amenity, soil and contamination within the surrounding locality. However, the impacts of the construction and operation of the facility are not yet known and would be further investigated during preparation of the EIS, in accordance with the issued NSW SEARs. Given that the facility would be located on land which is already disturbed, biodiversity and heritage impacts are likely to be negligible.
Bringelly Road Upgrade	RMS is in the process of planning for the upgrade and widening of Bringelly Road between Camden Valley Way and The Northern Road intersection. The project proposes to increase the road reservation to two twin carriageways separated by a wide median. The road upgrade would cater for future traffic growth, mainly arising from increased residential and commercial activity in the area as a result of the development of the South West Growth Centre.	Cumulative impacts during construction are unlikely, given the distance between the sites.	Construction is to be undertaken in two stages: • Stage 1: 5.7 km upgrade from Camden Valley Way to King Street • Stage 2: 4.3 km upgrade from King Street to The Northern Road. Stage 1 is expected to start by 2016.	Construction activities are likely to result in impacts on biodiversity, hydrology, noise, socio-economics, and traffic and access. Appropriate measures would be put in place to mitigate impacts.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
Sandy Point Glass Waste and Resource Management Facility	Benedict Industries Pty Ltd is proposing to develop a glass, concrete and sand processing facility at the Sandy Point Quarry located at 14309 Heathcote Road Menai. It is proposed to operate the facility in conjunction with the existing quarrying operations at the site. The existing quarry has been licensed for 200,000 tonnes per annum. The proposal seeks to increase the production to 440,000 tonnes per year.	There is no timing information publicly available for the construction and operation of the glass, concrete and sand processing facility. It is possible that construction and/or operation would be occurring at the same time as the Project construction and/or operational phases. The Project site is located approximately 10km north-west of the proposed Sandy Point Glass Waste and Resource Management Facility.	No timing information publically available for Sandy Point Glass and Waste Resource Management Facility.	Construction and operation of the Waste Resource Management Facility is likely to have air, dust and noise impacts, flora and fauna, traffic and parking, hazards and risk, heritage, visual, social and economic impacts. Detailed assessments of these impacts have not yet been undertaken and would be prepared as part of the EIS for the facility. Therefore, a detailed assessment of the cumulative impacts of the facility in combination with the Project cannot be undertaken at this stage.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
Heathcote Ridge, West Menai	The Gandangara Local Aboriginal Land Council is seeking to list a 850 hectare site in West Menai as a 'State Significant Site' and to rezone the land to allow for: • 182.7 ha of residential land' • 51.4 ha of employment land; • 566 ha of conservation land; and • new roads, bridges and community facilities. The proposed development includes residential and employment precincts and a town centre, serviced by a network of streets, open spaces and community facilities. The proposed development is currently being considered by DP&E. The public exhibition period closed February 2012. In addition, on 16 November 2011, the Australian Government entered into an agreement with the Local Aboriginal Land Council to undertake a strategic assessment of the proposed development at Heathcote Ridge,	The Heathcote Ridge site is located approximately 10 km south-east of the Project site. Construction phases for both projects could overlap. In addition, if the development goes ahead, the IMT would operate at the same time that the Heathcote Ridge precinct becomes occupied.	If approved, development would occur progressively until 2030.	The *State Significant Site Study* (BBC Consulting Planners 2011) prepared as part of the application for inclusion of the site as a 'State Significant Site' identifies that the development would have impacts during construction and when the land becomes occupied. This includes biodiversity, hydrology and water quality, heritage, traffic social and economic impacts. The *State Significant Site Study* (BBC Consulting Planners 2011) notes that improvements in the regional road network would need to be provided to cater for forecast increase in traffic volumes from the Heathcote Ridge development and the general growth in traffic within the region. Some road upgrades are proposed as part of the development which includes Heathcote Road widening, intersection upgrades and a new east west link connecting Bangor Bypass and Heathcote Road. Should the development be approved, a more detailed assessment of the impacts in combination with the Project impacts would be undertaken as part of the Stage 2 SSD application for the Project.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
Moorebank Waste Facility	The proponent, Concrete Recyclers Group is proposing to develop a Materials Recycling Facility in Moorebank, north of the M5 Motorway and south of Newbridge Road. The proposed facility would have capacity for 500,000 tonnes a year and would receive concrete, brick, asphalt, sandstone and sand for recycling from the construction industry. The Project is currently under assessment by DP&E. The public exhibition period closed April 2013.	The proposed recycling facility is located approximately 4.5 km north-east of the Project site. There is potential for overlap of the construction phases for both projects. In addition, once constructed, both projects are likely to be operating at the same time.	There is no detail provided as to when construction would commence. However, the EIS currently under consideration by DP&E states that construction would occur for approximately six months. Operation hours for the facility are proposed to be 7.00 am to 6.00 pm Monday to Saturday.	The Environmental Assessment prepared as part of the application outlines the air quality, noise, visual, traffic geotechnical, flora and fauna and water quality and hydrology. Again, should the recycling facility receive approval, a detailed cumulative assessments of the Project in combination with the facility would be undertaken as part of the Stage 2 SSD application.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
Georges Cove Marina	The construction and operation of a marina and related facilities at 146 Newbridge Road has recently been approved by the Sydney West Joint Regional Planning Panel (approved 22 August 2014). The marina includes a maritime building, 186 craft berths, car parking, marine club house and supporting infrastructure.	The marina would be located approximately 5 km north-east of the Project site. There is potential for both the construction and operational phases of both projects to overlap.	A detailed construction plan is not publicly available; however, the EIS for the development notes that construction is likely to take approximately 22 weeks, with piling over a period of 10 weeks. The marina will operate seven days a week, 7.00 am to 10.00 pm.	The Environmental Impact Statement prepared for the marina development (Benedict Industries Pty Ltd 2012) discusses the potential impacts of the Project. In terms of the cumulative impacts of the Project, the following has been determined: • Traffic movements for the marina are expected to occur at different times from those at Moorebank IMT and it is unlikely that the traffic peaks for both projects would coincide. The marinas peak traffic generation is likely to occur on weekends and during functions on late Friday and Saturday evenings. The Liverpool City Council's Planning Panel Report makes reference to peak movements to and from the marina of between 20 and 30 vehicles per hour during peak hours (rising to 60 trips per hour on special event days). Trips per hour on Friday and Saturday evenings could increase to as many as 220 vehicles per hour and occur after the main background road traffic peak. Between 20 and 30 vehicles per hour during peak hours are negligible when distributed onto the surrounding network where drivers would have the choice of four different directions to/from the marina. The peak 220 vehicles would occur when the background road traffic volumes are heavily reduced; therefore, the road network would adequately accommodate this marina related traffic.

Project	Project description	Relationship to Project	Indicative project date	Potential or known impacts
				• The marina would be located downstream of the Project site. With the stormwater treatment in place as proposed as part of this Project, improvements to the quality of stormwater discharging from the Project site are expected. In addition, on site detention systems would detain flow and control discharge rates from the Project site to the Georges River at pre-development discharge rates. Therefore, no cumulative impact for water quality and regional flooding is expected. • The potential visual and noise quality impacts are specific to each project and would not extend beyond the local vicinity of each site. As such, the projects are not likely to give rise to any significant adverse cumulative impacts and these issues have not been considered further. A more detailed assessment of the cumulative impacts of the Project with the marina would be undertaken as part of the Stage 2 SSD.

27.3 Management and mitigation

27.3.1 Cumulative construction impact mitigation

Should the Project receive approval and both the Project and the SIMTA development proceed to detailed design and subsequent approvals under the EP&A Act, consideration would be given to the potential combined coordination of construction management plans where appropriate and relevant. Opportunities to reduce environmental impacts throughout the construction and operation of the two projects would be explored, and may include construction noise sharing agreements, traffic and air quality goals, and the integration of environmental management plans.

27.3.2 Cumulative traffic impact mitigation

As discussed in section 27.2.1, while there would be an increase in delays at intersections along Moorebank Avenue as a result of the cumulative impact of the Project and the SIMTA development, all intersections would still operate with a satisfactory LoS of C or better, with the exception of the Moorebank Avenue and Anzac Road intersection.

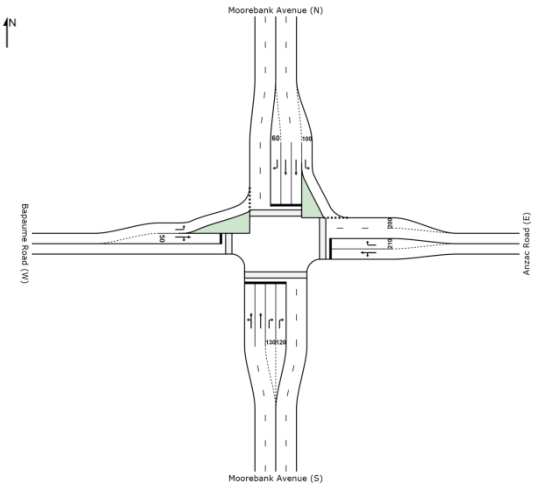
In the case of cumulative scenario 3, the following intersection modifications would need to be considered:

- Moorebank Avenue/Anzac Road intersection:
  - > modification of the traffic signal cycle;
  - > provision of a dual right turn lane on the Moorebank Avenue south approach; and
  - > extension of the length of left turn slip lane on Moorebank Avenue north approach;
- Moorebank Avenue/DNSDC Access intersection and Moorebank Avenue/Moorebank IMT Main Access/SIMTA central access intersection;
  - > provision of a shared left and right turn kerbside land on the DNSDC access and the SIMTA central access.

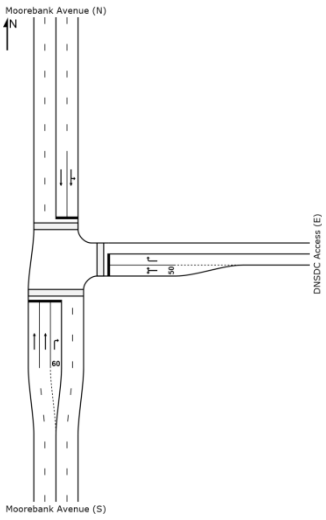
These changes are shown in Figure 27.4.

For scenarios 1 and 2 the intersection of Moorebank Avenue and Anzac Road is the only intersection that would operate at capacity during the peak periods; however, queues are not expected to affect the M5 Motorway. Therefore, no upgrades beyond that already proposed as part of the Project (refer to section 11.3 in Chapter 11 – *Traffic, transport and access*) are required for cumulative scenarios 1 or 2.

Moorebank Avenue/Anzac Road/Bapaume Road intersection



Moorebank Avenue/DNSDC access intersection (modified intersection for cumulative scenario 3)



Moorebank Avenue/Moorebank IMT main access/SIMTA central access intersection (modified intersection for cumulative scenario 3)

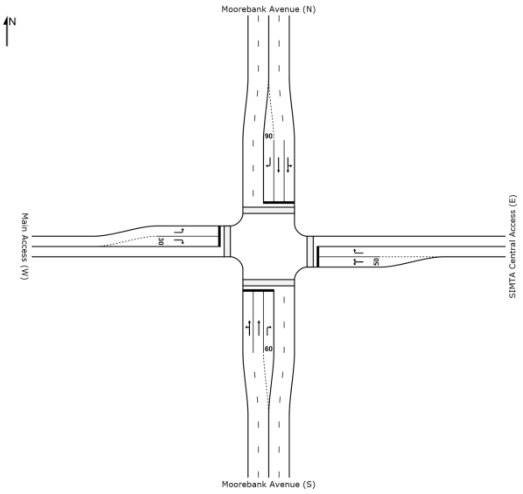


Figure 27.4 Modified intersects for cumulative scenario 3

27.3.3 Local air quality cumulative impact mitigation

The management and mitigation of potential air quality impacts relating to the Project and the SIMTA development during operation would be the separate responsibility of the Project developers and operators of these respective sites, in accordance with the established EPA and NEPM criteria. However, a combined approach to air quality mitigation may be taken where appropriate, particularly for cumulative scenarios 2 and 3.

The design and implementation of air quality mitigation would need to be determined for the final staged operations during the detailed design phase and included, as required, in the environmental assessment for the Stage 2 SSD approval(s). The air quality management and mitigation measures recommended in Chapter 17 – *Local air quality* are considered suitable for the management of air quality in relation to the Project.

Dependent on the progress of the proposed SIMTA development, the Project may require additional mitigation to comply with air quality criteria. Any additional mitigation would be considered further through the development of the detailed design.

Regular meetings between the operators of the Project and the SIMTA development would need to be established to manage complaints or issues relating to air quality. Where necessary, a review of simultaneous operations would be considered, potentially resulting in the coordinated management of potential issues.

27.3.4 Noise cumulative impact mitigation

The Project and SIMTA development operators would be responsible for the management and control of noise and vibrations resulting from the operation of their respective sites. In all cases the objective would be for each development to meet the operational noise criteria established as part of regulatory approvals and licensing. However, a combined approach to noise impact mitigation may be taken where appropriate, particularly for cumulative scenarios 2 and 3.

As with the air quality mitigation measures, the design of noise mitigation would need to be determined for the final staged operations during the detailed design phase and included, as required, in the environmental assessment for the Stage 2 SSD approval(s).

The design of noise mitigation would need to be responsive to the final design development of the SIMTA site and, where available, adopt measured operational noise levels from SIMTA (if commissioned). The noise management and mitigation measures recommended in Chapter 12 – *Noise and vibration* are considered suitable for the management of noise from the Project.

Should the SIMTA development proceed to detailed design, the Project may be required to implement further noise mitigation to comply with the relevant noise criteria. It is recommended that a detailed assessment of sleep disturbance be undertaken during the detailed design of both operations.

Regular meetings would need to be established to manage complaints or issues relating to noise management between the operators of the Project and the SIMTA development. Where necessary, a review of simultaneous operations would be considered, potentially resulting in the coordinated management of potential issues.

27.3.5 Heritage cumulative impact mitigation

Measures to mitigate the cumulative Aboriginal and European heritage impacts would include those already proposed as part of the Project in combination with investigating, archiving, salvage and relocation (where feasible) of items on the SIMTA site. These measures would be investigated and determined once the final design for each project is determined.

27.4 Summary

In summary, the key aspects of the cumulative impact assessment are as follows:

- A comparison of the construction schedules for the SIMTA project and the Moorebank IMT has determined that the most significant construction works would take place at different times and therefore substantial cumulative construction impacts of the Project and the SIMTA development would largely be avoided.
- Intersections along Moorebank Avenue would experience in an increase in DoS and delay times; however all intersections would operate with a satisfactory LoS or better, except the intersection of Moorebank Avenue and Anzac Road.
- For cumulative scenario 3, intersection upgrades would be required for the Moorebank Avenue, Anzac Road and Bapaume Road intersection to address the impacts as a result of increased traffic.
- The incremental (i.e. Project and the SIMTA development only, without reference to background air quality) air pollutant concentrations were predicted to be within the NSW EPA and NEPM criteria for all three cumulative scenarios. However, when considering the background air quality, infrequent exceedances of the NSW EPS 24-hour PM_{10} and $PM_{2.5}$ occur at the closest receptor to the Project site boundary. However, the ambient concentrations are already exceeded as a result of extensive bushfire activity in late 2013 and, with the exception of receptor R33, the cumulative scenarios do not result in any additional exceedances.
- Under neutral metrological conditions the unmitigated noise levels for cumulative scenarios 1 and 2 are predicted to comply with the amenity noise criteria at Glenfield and Wattle Grove. However at Casula predicted levels exceed the evening noise criterion. Cumulative scenario 3 complies with the amenity noise criteria at Glenfield, but exceeds the evening and night time criteria at Casula and the evening criteria at Wattle Grove.
- The cumulative effect of development on both sites will result in the removal of approximately 75–84 ha of vegetation. However, no population of any species of local occurrence known or likely to be present on the Project site is considered likely to be on the verge of a critical threshold for habitat loss or degradation. Any increase in the cumulative impact of both the Project and the SIMTA development would require corresponding increase in the provision of suitable offsets.
- There would be greater collective impact on European heritage resulting from the development on both the Project site and the SIMTA site. The impact on European heritage on the SIMTA site including the loss of WWII buildings, would further compound the rarity and representativeness of any remaining heritage items both within the Project site and the wider landscape.
- It is anticipated that there would be a low to moderate increase in Aboriginal heritage impacts, when compared with the Project alone. Further testing is required to confirm the likely impact on archaeological resource across both sites.

Table 27.15 Summary of cumulative impacts

Impact	Cumulative scenarios (IMT layout and associated rail access connection)		
	Scenario 1	**Scenario 2**	**Scenario 3**
Traffic			
Increase in traffic requiring additional upgrades to Moorebank Avenue/Anzac Avenue/Bapaume Road intersection to mitigate impacts	-	-	•
Air			
Incremental (project only)			
Air pollutant concentrations and dust deposition rates that exceed NSW EPA criteria and NEPM advisory reporting goals	-	-	-
Background cumulative concentrations and existing air quality			
Air pollutant concentrations and dust deposition rates that exceed NSW EPA criteria and NEPM advisory reporting goals for PM_{10}.	•[1]	•[1]	-
Air pollutant concentrations and dust deposition rates that exceed NSW EPA criteria and NEPM advisory reporting goals for $PM_{2.5}$.	•[1]	•[1]	•[1]
Air pollutant concentrations and dust deposition rates that exceed NSW EPA criteria and NEWP advisory reporting goals for all other pollutants.	-	-	-
Noise			
Exceedance (occasionally) of applicable noise criteria at Casula, under neutral meteorological conditions	•	•	•
Exceedance (occasionally) of applicable noise criteria at Wattle Grove, under neutral meteorological conditions	-	-	•
Exceedance of applicable noise criteria at Glenfield, under neutral meteorological conditions	-	-	-
Exceedance of applicable noise criteria for non-residential receptors	-	-	-
Biodiversity			
Clearing of threatened ecological communities including: • Castlereagh Swamp Woodland • Castlereagh Scribbly Gum Woodland • Riparian Forest (River-Flat Eucalypt Forest) and Alluvial woodland (River-Flat Eucalypt Forest) • Freshwater Wetlands.	•	•	•
Aboriginal and European Heritage			
Increase in Aboriginal heritage impacts (above the impacts of the Project along) with potential impacts to Aboriginal artefact(s) and Aboriginal PAD on the SIMTA site	•[2]	•	•
Significant increase in impacts on European heritage (above the impacts of the Project alone) with loss of some or all WWII buildings on the SIMTA site	•	•	•

Key: • = impact, - = no impact

Note 1: Exceedance only reported at one receptor. Peak ambient concentrations are already above the goals due to influence of bushfire activity in late 2013.

Note 2: Only one Aboriginal isolated artefact likely to be impacted.

Other cumulative impacts include human health; hazards and risks; hydrology; greenhouse gases; visual; regional air quality; waste and resource management. These have been considered and detailed in section 27.2.2. No significant impacts are expected.

Key measures proposed to manage and/or mitigate the cumulative impacts include the following:

- For all three cumulative scenarios, the conceptual noise mitigation for the Project demonstrates that feasible and reasonable noise mitigation can control the noise emissions from the Project site and the SIMTA site to achieve the amenity noise criteria.
- The design and implementation of air quality mitigation would need to be determined at detailed design for all three cumulative scenarios. Depending on the final layout of the Project and the SIMTA project, additional mitigation may be required to comply with air quality criteria. Coordinated management of issues would be considered.
- Upgrades to Moorebank Avenue/Anzac Avenue/Bapaume Road intersection would be required to address impacts associated with cumulative scenario 3. No additional upgrades required above those already proposed as part of the Project for cumulative scenarios 1 and 2.
- Measures to mitigate the cumulative impacts would include those measures already proposed as part of the Project in combination with mitigation measures proposed for the SIMTA development. The measures would be confirmed at detailed design and subsequent Stage 2 SSD applications.
- Measures to mitigate the cumulative Aboriginal and European heritage impacts would include those already proposed as part of the Project in combination with investigating, archiving, salvage and relocation (where feasible) of items on the SIMTA site.