

REPORT

IMPACT ON SOCIETAL RISK FROM BIP

PROPOSED WAREHOUSE DEVELOPMENT 42 RAYMOND AVE, MATRAVILLE

HALE CAPITAL PARTNERS

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Impact on Societal Risk from BIP	
Proposed warehouse development 42 Raymond Ave, Matraville	Date: 5-Jul-2022



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ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
BIP	Botany Industrial Park
DPE	(NSW) Department of Planning and Environment
EIS	Environmental Impact Statement
fN	Frequency / number of fatalities (societal risk curve)
GFA	gross floor area
ha	hectare
HIPAP	Hazardous Industry Planning Advisory Paper
Ν	Maximum number of fatalities
NSW	New South Wales
QRA	Quantitative Risk Assessment
SSD	State Significant Development
TZ	Travel Zone



1. INTRODUCTION

1.1. Background

Hale Capital Partners (Hale) propose to develop a warehouse and distribution centre at 42 Raymond Ave, Matraville. The proposal is a State Significant Development (SSD-315523370) and an Environmental Impact Statement (EIS) was submitted to the NSW Department of Planning and Environment (DPE) in early 2022. The DPE has requested additional information be provided in relation to the EIS (ref: letter 23 May 2022).

The development site is in the vicinity of the Botany Industrial Park (BIP). A publicly available Quantitative Risk Assessment (QRA) report prepared by Sherpa Consulting Pty Ltd (Sherpa) presents the individual and societal risk around the BIP. (This report is referred to as 'BIP QRA 2018', Ref [1]).

DPE's request for information includes a requirement that additional information on the potential impact of the proposal on the societal risk presented in the BIP QRA 2018 report be provided as reproduced in extract below:

4. The subject site is located approximately 280 m south of Botany Industrial Park (BIP), outside the relevant individual risk contours of the 2018 BIP QRA, thus satisfying the individual risk criteria in the Department's Hazardous Industry Planning Advisory Paper No. 10, 'Land Use Safety Planning'. However, further information is required on how the proposed development will ensure compliance with the societal risk once operational (should development consent be granted). As such, the Applicant should verify the population associated with the operation aligns with the employment population limit, in response to the findings of the 2018 BIP QRA.

Assessment of changes of population can be undertaken using the BIP QRA software model which is retained by Sherpa on behalf of the BIP. Consent from the BIP has been obtained by Sherpa to use the BIP QRA 2018 model for assessing the risk impact of population changes associated with industrial developments in the vicinity of the BIP.

Hale retained Sherpa to undertake the societal risk modelling and provide an assessment of the impacts that can be provided to the DPE as part of the response to the request for further information.

1.2. Study objectives and scope

The overall objective is to determine the effect on the societal risk of the proposed development. The study scope covers:

- Estimation of change in population associated with the proposed development only. All other populations remain as per the BIP QRA 2018.
- Model update and provision of results in the form of a risk report.



1.3. Exclusions and limitations

This assessment is limited solely to assessing the change in societal risk as a result of the proposal for 42 Raymond Ave, Matraville, compared to the societal risk presented in the BIP 2018 QRA report. No other changes or developments (compared to the population data used in the BIP QRA 2018) are accounted for. All other assumptions in the BIP QRA 2018 model remain unchanged.

This assessment does not contain advice as to the acceptability or otherwise of the proposed development from a risk perspective. The planning authority will use the results in the assessment as an input to making this decision.

This assessment does not address any other matters in DPE's request for further information.



2. DEVELOPMENT PROPOSAL

2.1. Proposed development description

The proposed development site is located at 42 Raymond Ave Matraville as shown in Figure 2.1. The site is zoned for industrial land uses and there is no change in zoning proposed. The site is approximately 280 m south of the nearest BIP boundary, and more than 300 m from the nearest process equipment.

The proposed layout of the development shows:

- The overall development site area is 22,774 m² with a total gross floor area (GFA) of approximately 19,500m² (see Figure 2.2).
- The building has a footprint of approximately 10,000 m². There will be four tenancies over two levels in the building. Each tenancy has a very similar area of approximately 5,000m². (See Figure 2.3 which shows the ground level layout and a floor area table for both the ground and first levels of the building).

2.2. BIP QRA 2018 population

The population in industrial areas was estimated in the BIP 2018 QRA from government supplied Travel Zone (TZ) data developed from the 2016 Census. The proposed development site is located in TZ428 in an area with an estimated day time population density (over the overall lot) of approximately 26.4 people/hectare (i.e. 60 people are already allowed for over the total site area in the QRA model), and a night time population of zero in the BIP QRA 2018 (see extract from 2018 BIP QRA, Appendix 8, Figure A8.1, reproduced in APPENDIX A). There is no information in the QRA about actual populations in specific buildings or occupancies in this area.

2.3. Population definition for proposed development

Population estimates for the proposed development have been supplied by Hale. Two cases were provided as shown in Table 2.1. The maximum case (eg a less automated/higher manning warehouse) was used for the modelling. This estimate is 210 full time equivalent jobs (covering 24-hour, 7 day a week operations).

Population was allocated to the tenancy areas as shown in Figure 2.4, assuming 105 people in total over all tenancies during a 12-hour day shift and 105 people during a 12-hour night shift, which is consistent with the 101 car spaces provided for the development. This is an average density of approximately 46 people/hectare over the whole site area, which is higher than the density reported in the BIP QRA 2018 for this area and similar to the upper density for any of the industrial areas modelled in the BIP QRA (which was 41.5 people/hectare).

As the tenancy footprints are very similar, for the purposes of modelling the effect on societal risk, the number of people was divided evenly across the tenancies 100% of time).



Figure 2.1: Location



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Figure 2.2: Layout - overall



Hale

22,774 m²

1,671 m²

17,789m²

1.671 m²

1.01:1

2395 m²

101 101

6 11

TOTAL 4935 m² 4565 m² 4866 m² 96 m² 30 m² 30 m² 19460 m²

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Table 2.1: Population definition

	Number of people				Density (p	people/ha)
Employment Output (Full time job years)	Warehouse operations	Admin & Logistics	TOTAL (24/7 operations)	Per shift (2 x 12 hours)	Whole site area	Over occupied area (footprint basis)
Area (m²)					22,774m ² (red bounded polygon in Figure 2.4)	Approximate tenancy footprint (5000m ² in south and 5000m ² in north) (ie yellow bounded polygons in Figure 2.4)
Population estimates:						
Upper estimate - Warehouse operation	94.9	115.2	210	105	46.1	105
Lower estimate - eg warehouse operation - semi automated	73.9	94.4	168	84	37.0	84

Key:

Maximum case – used in societal risk modelling	
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Figure 2.4: Population polygons



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3. **RISK ASSESSMENT**

3.1. **Risk criteria**

HIPAP No. 10, Land Use Safety Planning, Ref [2], specifies risk criteria for new development in the vicinity of potentially hazardous facilities (such as the BIP) and provides guidance for application of the criteria. The guantitative risk criteria are the same as those specified in HIPAP No. 4, Risk Criteria For Land Use Safety Planning, Ref [3]. Risk criteria are provided for two types of risk:

- Individual risk which is a measure of the risk at a location. This does not account for specific populations or probability of presence and can be regarded as the risk at a location (i.e. would be equal to the risk to a person assuming 24 hour occupancy, 365 days per year). This is a function of the source of risk and is unaffected by the characteristics of a development. Risk criteria are defined for different sensitives of land use (with industrial as the least sensitive and 'sensitive' which includes vulnerable, difficult to evacuate populations such as childcare and hospitals).
- Societal risk is a measure of the probability of incidents affecting an actual person/population. In accordance with the HIPAP No. 10 requirement, where a development proposal involves a significant intensification of population in the vicinity of a potentially hazardous facility, the change in societal risk needs to be accounted for, even if individual risk criteria are met.

The applicable quantitative fatality risk criteria to the proposal are summarised in Table 3.1, which shows the risk criteria for industrial land uses as applicable to this proposal.

Risk type	HIPAP No. 10 guidance	Assessment
Individual fatality risk	An industrial development should not be exposed to levels of risk above <u>50 in a million per</u> <u>year</u> (50 x10 ⁻⁶ per year).	The proposed development is well outside all the BIP QRA 2018 individual fatality risk contours hence these criteria are met. This is shown in the individual fatality risk contours reproduced in Figure 3.1.

Table 3.1: Applicable HIPAP No. 10 criteria



Risk type	HIPAP No. 10 guidance	Assessment
Societal risk	Where a development proposal involves a significant intensification of population in the vicinity of such a facility, the change in societal risk needs to be taken into account even if individual risk criteria are met. NOTE: This applies to any population and is not related to particular land uses/sensitivities of population.	 Assessment of societal risk due to proposed intensification of population and comparison against HIPAP No. 10 societal risk is provided in Section 3.4 of this report. This uses the BIP QRA 2018 model 'Approved Development' fN curve case as a basis. It is noted that the societal risk from the BIP as per the BIP QRA 2018 for the 'approved development' case: is in the 'ALARP' region for N < 1000 for the 'approved population' case, the maximum number of people 'N' affected already exceeds the HIPAP 'N limit' i.e. the maximum N is limited to 1000. The results graph was extrapolated past the criteria 'N limit' of 1000 to show this.

3.2. Societal risk assessment

HIPAP No. 10 provides the following evaluation guidance for societal risk:

- Provided the incremental societal risk lies within the negligible region, development should not be precluded.
- If incremental risks lie within the ALARP (As Low As Reasonably Practicable) region, options should be considered to relocate people away from the affected areas.
- Finally, if there is still a significant portion of the societal risk plot within the ALARP region, the proposed development should only be approved if benefits clearly outweigh the risks.

The following assessments of societal risk were undertaken:

- Incremental societal risk from the proposed development (i.e. the proposed development population only).
- Impact on the cumulative societal risk due to the proposed development (i.e. the proposed development population plus populations already included in the BIP 2018 QRA model).

3.3. BIP QRA 2018 societal risk profiles

For the 2018 BIP QRA (Figure 9.8), two societal risk profiles were included. These were:

1. *Current Development* – this refers to the societal risk profile assessed for populations on existing developments which were based on the 2016 Census data (residential) and journey to work data (employment travel zone data).



- 2. Approved Development this refers to the societal risk profile assessed for Current Development plus conservatively set population estimates for developments that have been approved around the BIP but were not yet occupied or were likely to have been occupied after the collection data of the 2016 Census. These included:
 - BIP subdivision on Denison Street and Corish Circle
 - Bunnings Warehouse on Denison Street (opposite the BIP)
 - Meriton redevelopment of the former British-American Tobacco site adjacent to -Westfield Eastgardens.

The approved developments are now occupied or partially occupied so the Approved Development societal risk case is used as the basis for assessing the impact of the proposed development.

3.4. Incremental societal risk from the proposed development

The incremental societal risk reflects the societal risk profile for the proposed development population only.

The incremental risk associated with the maximum additional population estimated for the proposal is shown in Figure 3.2 and is in the 'negligible region'.

3.5. Impact on cumulative societal risk

The cumulative societal risk profile (i.e. including the additional new population allocated to the new polygons in the model as per Figure 2.4) was compared against the 2018 BIP QRA Approved Development societal risk profile. The cumulative societal risk comparison is presented in Figure 3.3.

There is no discernible impact on the cumulative fN curve, and specifically no change in the portion of the existing curve that extends past 'N' of 1000.

3.6. Sensitivity case

The subject site is at the periphery of the area where population significantly affects societal risk from the BIP.

To illustrate this, a sensitivity case has been included showing the effect of double the anticipated maximum population (ie 210 people in total 24 hours, 7 days per week) compared to the maximum estimated population of 105 people. As per Figure 3.2 the incremental risk remains well within the 'negligible region' and the cumulative societal risk presented in the BIP QRA 2018 is not materially affected.





Figure 3.1: Individual fatality risk contours, BIP QRA 2018

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Figure 3.3: Comparison against BIP QRA 2018 Approved Development case

NOTE: there is no material difference in cumulative results as the development area is on the periphery of the area where population affects societal risk. All cumulative curves are directly overlaid so only one curve is visible in the graph above.

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4. CONCLUSION

Overall, the results show:

- The incremental societal risk for the development proposal at 42 Raymond Ave remains in the 'negligible' region of the societal risk graph as per Figure 3.2 for the most conservative (maximum) population case. Therefore, as per HIPAP No. 10 criteria, the development should not be precluded on the basis of incremental societal risk.
- The maximum anticipated population for the development proposal (105 people present 24 hours per day 7 days per week) does not affect the cumulative societal risk compared to the Approved Development societal risk case presented in the BIP QRA 2018 as shown in Figure 3.3.
- Populations in the proposed development area do not significantly affect the cumulative societal risk from the BIP. This is illustrated by a sensitivity case with double the anticipated maximum population (210 people present 24 hours per day 7 days per week) that demonstrates there is no material effect on the cumulative societal risk for the Approved Development societal risk case presented in the BIP QRA 2018.



APPENDIX A. POPULATION DENSITY IN BIP QRA 2018

A1. Day time



Note: 5.75 – 8.13 people/2500 m² as per legend equals 23 - 32.5 people/hectare.

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A2. Night time



Note: No night time population is allowed for in this location in the BIP QRA 2018 model.

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A3. Travel Zone data

Transport NSW TZP2016 Employment

Proje	ections	-					
ΤZ	Description	Area (m2)	Employment (2016)	Population (Day time)	Pop Density (psn per 2500m2)	Pop Density (psn per ha)	Population (Night time)
428	Port Botany Business Park_West	347920	917	917	6.6	26.4	0



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APPENDIX B. REFERENCES

- [1] Sherpa Consulting Pty Ltd, "Botany Industrial Park Quantitative Risk Assessment (QRA) Report, Document Number: 21158-RP-001, Rev 1," 2018. [Online]. Available: https://www.planning.nsw.gov.au/-/media/Files/DPE/Reports/quantitative-risk-assessment-2018-botany-industrial-park-report-2020-01-24.pdf?la=en.
- [2] NSW Department of Planning and Environment, "Hazardous Industry Planning Advisory Paper No. 10 - Land Use Safety Planning," 2011.
- [3] NSW Department of Planning and Environment, "Hazardous Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use Safety Planning," 2011.