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7 January, 2015

Chris Ritchie
NSW Department of Planning and Environment
23-33 Bridge Street
Sydney NSW 2001
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Our Reference: 0226308L01 SSD5041 RESPONSE TO SUBMISSIONS_FINAL.DOCX

Attention: Chris Ritchie

Dear Chris,

RE: KINGS PARK WASTE METAL RECYCLING FACILITY (SSD 5041)- RESPONSE TO STATE AGENCY AND COMMUNITY SUBMISSIONS

1. OVERVIEW

Environmental Resources Management Australia Pty Ltd (ERM) on behalf of Sell & Parker (the Proponent) is pleased to provide a response to the submissions received in relation to State Significant Development Application (SSD 5041).

Broadly, the proposal involves the expansion of the existing Kings Park Metal Recycling Facility (the Facility) located at 45 Tattersall Road, Kings Park by:

- expanding the facility onto an adjacent site to the east encompassing 23-43 Tattersall Road;
- increasing the overall processing capacity from 90,000 tonnes per annum (tpa) to 350,000 tpa; and
- modifying the existing layout of the facility including alterations to existing on-site buildings and the construction of new buildings and associated infrastructure.

Environmental Resources Management Australia Pty Ltd
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2. SUBMISSIONS

A total of nine submissions were received with six provided by Council and State Agencies and three provided by commercial business located in close proximity to the Facility (refer *Table 1*).

Table 1

State Agency Submissions	Community Submissions
Blacktown City Council	Power Plastics Pty Ltd, Kings Park, NSW
NSW Department of Primary Industries (DPI)	Christmas Services Australia, Kings Park NSW
NSW Environmental Protection Authority (EPA)	
NSW Office of Environment and Heritage (OEH)	
NSW Roads and Maritime Services (RMS)	
Sydney Water Corporation (SWC)	

A response to each submission raised has been provided in *Annex A*. Updated supporting information pertaining to SSD Application 5041 has been provided in the following annexures:

- *Annex B*- Revised Summary of Mitigation Measures;
- *Annex C*- Additional Traffic Information;
- *Annex D*- Revised Air Quality Assessment and Benchmarking Study;
- *Annex E*- Revised Environmental Risk Assessment; and
- *Annex F*- Breakfast Creek and Riparian Zone- Additional Documentation.

3. CONCLUSION

We trust the response to the submissions received and the additional supporting information provided is adequate in addressing the issues raised. ERM on behalf of the proponent look forward to hearing your response on the matter. If you have any queries, please contact Chris Page on 02 8584 8898 or via email at chris.page@erm.com.

Yours sincerely,
for Environmental Resources Management Australia Pty Ltd

Chris Page
Project Manager

Murray Curtis
Partner in Charge

Annexes:

Annex A	*Response to Submissions*
Annex B	*Revised Summary of Mitigation Measures*
Annex C	*Additional Traffic Information*
Annex D	*Revised Air Quality Assessment and Benchmarking Study*
Annex E	*Revised Environmental Risk Assessment*
Annex F	*Breakfast Creek and Riparian Zone- Additional Documentation*

Annex A

RESPONSE TO SUBMISSIONS

Agency	Aspect	Submission	Proponent Response
Blacktown City Council	• Operational Management • Flooding and Drainage • Site Contamination • Building Certificates • Demolition	To ensure that a high standard of development is achieved, and that the development operates in a manner that will have no adverse impact on the surroundings, it is requested that consideration be given to the recommended conditions listed in Attachment A (to the letter received). Council's recommended conditions address the following particular concerns: 1. Operational management, including potential projectiles and emergency response to explosions on site. 2. Flooding and drainage issues. 3. Site contamination. 4. Separate DA for demolition as inadequate information has been submitted to address the demolition component.	The Council have stated that they have "no in principle objection to the proposed project", and have accordingly recommended a number of conditions of consent. As part of this submissions report we wish to respond to key aspects of the Council recommended conditions of consent as provided in the following sub-headings. We respectfully wish to retain the opportunity to have further detailed discussion and reply to DP&E on the remaining conditions of consent (both the Council and others), when DP&E are in a position to issue draft conditions of consent for the proposed project. <u>Separate DA for fit-out (condition 1.1.1)</u> The Council have requested a DA for fit-out of each building. The DA includes the use of each premises and associated building works, which are detailed in the plans. A construction certificate will be obtained for any ancillary building works associated with the project and therefore consider that a separate DA's for fit outs are not required. The intention of the State Significant Development process is to integrate and streamline the planning approval process for major projects, and to avoid requirements to obtain separate approvals from other regulatory authorities. Therefore a request from Council to obtain a separate DA for fit-out and demolition (see below) is unreasonable and unnecessary in the circumstances of the case. <u>Separate DA for demolition (condition 1.1.2)</u> The Council have requested that a separate DA be lodged for the demolition of existing buildings and structures. As part of the development application consent has been sought for demolition and therefore any requirement to lodge a separate development application for demolition is unnecessary. It is further noted that the demolition of industrial buildings can be dealt with as Complying Development. <u>Lot consolidation (condition 2.1.1)</u> The Council have requested that Lot 5 DP 7086 and Lot 2 DP 550522 be consolidated into one allotment prior to the issue of a construction

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			certificate for the development. We object to this condition on the grounds that it is unnecessary and unreasonable to require the applicant/owner to consolidate the two properties. It is generally acceptable that development can occur over two or more allotments, particularly on large development projects such as the proposed. The operation of the development over two properties does not give rise to any Building Code of Australia (BCA) issue, as no buildings are proposed to be built over or adjacent to the existing shared property boundary. Furthermore from an access perspective, both of the existing lots will continue to have public road access. Therefore consolidation of the two property boundaries is not warranted for the development. <u>Services and Utilities (condition 2.2.1(b))</u> A "Notification of Arrangement" Certificate has already been provided stating that electrical services including the provision of street lighting have been made available to the development. <u>Landscaping (condition 2.3.1)</u> The condition states that suitable buffer/screen planting must be provided adjacent to Tattersall Road. In particular, tall tree planting is to be undertaken along Tattersall Road to provide screening of internal equipment on site. Sell and Parker note that a vegetating screen has already been established adjacent to Tattersall Road in a manner to reduce the visibility of plant and equipment within the site. A revised landscaping plan has been prepared as part of the SSD submission which provides additional screen tree planting at the street frontage. <u>Site contamination (condition 2.4.1);</u> ERM undertook a phase one environmental site assessment (ESA) to determine the suitability of the site for ongoing industrial use. The report found that there were limited exposure pathways for receptors and that the key identified risk was from an existing wash down sump located at the rear of 23-43 Tattersall Road, with the possibility of locally impacted soils and groundwater associated with its future demolition. However given

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			the limited works and fact that the pit is concrete lined and in sound condition, this risk is considered acceptable and unlikely to cause a contamination pathway to receptors. Whilst there is some limited potential for contamination, the existing industrial land use will continue on the site, and together with mitigation measures during construction, contamination risks will be suitably managed. It should be further noted that there is limited ground disturbance, with most works relating to demolition of existing structures and sealing of currently non-sealed areas, thereby in itself limiting potential exposure to contaminated soils and groundwater. A phase 2 detailed site investigation is therefore unreasonable and unnecessary given the findings of the phase one ESA report and the ongoing and continued industrial use of the site. <u>Site operations (condition 2.6.1);</u> Council have requested that a Construction Environmental Management Plan (CEMP) be prepared for the site operations. We raise no objection to the preparation of this document, however note that the CEMP will be prepared in consultation with the EPA and is anticipated to be approved by DP&E. The premises and operations will be a scheduled activity with the EPA and therefore ongoing compliance will rest with the EPA. <u>Building and occupation certificates (condition 2.11.1)</u> Council has requested final occupation certificates for works undertaken approximately 14 years ago under DA's determined in 2000 under DA 99-7797 and a building certificate for an alleged un-authorised structure referred to as building "D". As part of the proposed development the proponent will be seeking and will obtain a construction certificate for all works on the site and would receive an occupation certificate if such works are undertaken in accordance with the consent and relevant provisions of the BCA. A building certificate may be lodged for any other structures not already approved and would be separately dealt with by the Council, which the

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			proponent would consult with directly with the Council. Traffic Matters (condition 2.12.1) The condition states that a detailed Construction Management Plan (CTMP) is to be submitted to Council prior to the issue of a Construction Certificate. The CTMP shall be prepared to the satisfaction of Council and the RMS. Sell and Parker are seeking an amendment to this condition by way of submitting the CTMP to an "Accredited Certifier" rather than submitting to Council. Flooding and drainage Condition 2.19.3) The council has required the drainage plan, prepared by Algorry Zapia and Associated Job 1049-13 be amended. The proponent would seek to address the comments raised by Council as part of the construction certificate application, as recommended by the draft condition.
NSW Department of Primary Industries (DPI)	Surface Water and Riparian Land	*Comment by the NSW Office of Water* **Breakfast Creek and Riparian Land** The EIS notes that "*the existing riparian vegetation within the operational boundary is sparse*" (see Section 6.6.2 of the EIS). Annex B (Development Consents) includes the development consent for the metal recycling facility (dated 27 November 1996), which includes a Condition of Approval 11(E) requiring that the "*landscaping is to include suitable species (including ground cover, shrubs and trees which at maturity will provide a dense screen of vegetation)*". As it appears the revegetation objective of the 1996 consent does not appear to have been met, the Office of Water recommends that a new approval includes a condition that will require revegetation to meet the original objectives. This should be implemented through a Vegetation Management Plan prepared	The Proponent acknowledges the issues raised by the NSW Department of Primary Industries (DPI) pertaining to the management of Breakfast Creek and riparian land located to the immediate south of the site. There have been significant works undertaken to Breakfast Creek by the Council. Whilst the property boundary of the subject site extends to the centre line of the creek, the Council have recently carried out environmental restoration works within the creek and riparian zone. These works initially included the creation of a formed creekline, and now have progressed to include vegetation and environmental restoration works within the riparian zone. See updated photographs of works within the Creek contained within *Annex F*. We have now included a copy of the landscape and vegetation management works which Council have proposed within the riparian corridor (See *Annex F*). It is considered that the recent works undertaken by the Council meet the policy objectives of DPI in terms of protecting and embellishing Breakfast Creek and therefore it is not necessary to impose

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		in accordance with the Office of Water's *Guidelines for vegetation management plans on waterfront land* (2012).
		
		Recommendations
		
		• It is recommended that the analysis in Table 7.4 is revised to include specific actions/mitigation measures that are proposed to mitigate potential impacts on the Breakfast Creek riparian corridor.
		• It is recommended the measures proposed in Table 9.1 include the riparian corridor along Breakfast Creek as a separate issue. The mitigation measures should include:
		  o A fully structured riparian corridor to be established on the site consisting of trees, shrubs and groundcover from the relevant vegetation community; and
		  o A Vegetation Management Plan is to be prepared for the protection, rehabilitation and ongoing maintenance of the riparian corridor at the site, in accordance with the Office of Water's *Guidelines for vegetation management plans on waterfront land* (2012).
		• It is suggested the Landscape Plan to show:
		  o The location of Breakfast Creek;
		  o The location of the top of bank;
		  o The footprint of the riparian corridor (measured from the top of bank within the site; and
		  o The riparian corridor to be planted with native plant species from the relevant local vegetation community, including trees, shrubs and groundcover species.
			additional riparian works upon the subject site as part of this consent.
			
			In respect to other items raised by DPI, we have updated the environmental risk assessment provided in *Table 7.4* of the Environmental Impact Statement (EIS) and it is now attached as *Annex E* to this report.
			
			<u>Drainage and Flooding (condition 5.4.6)</u>
			
			The condition states that written evidence is to be provided that the registered owner/lessee has entered into a minimum five (5) year signed and endorsed maintenance contract with a reputable and experienced cleaning contractor for the maintenance of the Humecpetors, pond and bioretention basin. Sell and Parker consider that this timeframe is excessive and are seeking an amendment to the condition to enter into a maintenance contract with a timeframe between 12 months to 2 years. This is sufficient time to determine the adequacy of the stormwater management system.

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NSW Environmental Protection Authority	Hammermill operations	In the EPA's comments on the draft EIS dated 22 April 2014, the EPA required the Proponent to provide additional information in relation to the hammermill operation, however these details were not included in the final EIS. The EPA requires the Proponent to: • Consider additional management practices, addressing the draining of oil and lubricants from cars prior to them being fed into the hammermill.	The proponent has well established controls in place with the existing operations, to manage the inspection of vehicles entering the pre-shredder and hammermill, to avoid excessive oils, lubricants and other materials. Nonetheless further management recommendations to be applied to the vehicle processing area include: • Vehicles are to be adequately drained prior to coming on the site, if possible, to minimise the requirement for on-site processing. If fluids are present processing must occur prior to recycling the vehicle. • Immediately after receiving a car on-site it should be confirmed that the fluid containing components have been drained/removed and that no leaks are present. If fluid containing components remain or leaks identified place drip trays and seal leaking pipes. • vehicle processing area is to be bunded to provide additional protection in the event of spills or overflows. • Clean up spills within in the bunded area (and across the site more broadly) immediately to prevent interaction with water • Ensure all fluids drained from vehicles are stored in appropriate, labelled containers to avoid the potential for cross contamination. • Always use funnels when transferring fluids to limit the potential for spillage. • Flock management – if vehicles (and other scrap metals) still contain hydrocarbons or other contaminants there is potential for contamination of the flock. Ensure that it is stored on hardstand, roofed location, with bunding to prevent entry of rainwater and upslope runoff. • Remove batteries and battery cable ends (that are often also constructed from lead). • Fuel filters to be removed and stored in a leak proof container. • Separate other fluids such as brake fluids, coolants, air conditioning fluid, window washing fluid, prior to recycling the vehicle. • Spill kits to be stored and maintained in the car handling location. The above additional mitigation measures have been included in the revised summary of mitigation measures (see *Annex B*).

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	Noise and Vibration	In the EPA's comments on the draft EIS dated 22 April 2014, the EPA required the Proponent to provide additional information in relation to the "Noise and Vibration Impact Assessment for EIS" prepared by Renzo Tonin & Associates (NSW) Pty Ltd dated 27 February 2014, however these details were not included in the final EIS. The EPA requires the Proponent to provide the following information: • The Noise and Vibration Impact Assessment states that the metal shears are the plant on-site with the greatest potential to produce vibration but the EPA has received complaints of excessive vibration generated by the hammermill, and officers of the EPA have experienced notable vibration in an adjoining premises that was attributable to operation of the hammermill; • It relies on measurements made in 2003, more than 10 years ago, on vibration from the metal shears, but presents no vibration data for the hammermill; and • The Report needs to include measured levels of vibration during operation of the hammermill. The EPA's own observations of vibrations or as described by the Proponent as "airbeat" caused by the "shaker" on the hammermill are excessive and causing offsite impacts. The EPA is not prepared to issue GTAs for this proposal until the Proponent has committed to addressing this issue to the EPA's satisfaction.	The Proponent acknowledges the EPA's comments regarding the Noise and Vibration Assessment. A revised Noise and Vibration Impact Assessment prepared by Renzo Tonin & Associates (2014) was provided with the EIS submitted to the DP&E in July 2014, which addressed the test of adequacy comments. The revised assessment included vibration measurements for the hammermill and the metal shear based on attended vibration measurements undertaken at the site on the 9 May 2014 and 3 June 2014 (refer to *Section 8.2*, *Annex H* of the EIS). At the time of the attended measurements, both items of plant were operating under normal operating conditions. The measured vibration levels of the metal shear and the hammer mill were also included in *Section 6.3.4* of the EIS. It was established by Renzo Tonin & Associates (2014) that vibration levels at the residential receivers would be insignificant, therefore the assessment only considered vibration levels at adjacent industrial premises. The assessment indicated that predicted vibration levels at the adjacent industrial premises from the operation of the hammermill and metal shear will comply with the preferred and maximum vibration levels for human comfort established under the EPA (2006) *Assessment Vibration; a Technical Guideline*. The outcome of this revised assessment was discussed in *Section 6.3- 6.3.5* in the July 2014 EIS, which was placed on public exhibition. The proponent is confident that EPA's queries regarding vibration generated from the operation of the hammermill have been adequately addressed.
	Water Balance/Discharge	The Proponent proposes to install two oil/water separators at the Premises to treat contaminated stormwater prior to discharge to Breakfast Creek. The EIS states that the Proponent will be seeking (following consent) alteration to the existing environment protection licence to allow for discharges to Breakfast Creek from the stormwater basin on Lot 5 DP 7086. The water balance in the EIS indicates that all water generated onsite can be reused for operational use. In this case discharge	The water balance indicates that the runoff captured in the stormwater basin could be used in the operation of the hammer mill. With 35% of the site's highly conservative estimated water use being available during a 90 percentile rainfall year. Examining the water usage on a daily basis, the water usage rate for proposed production increase is approximately 265kL/day. Prior to the recent regrading works that occurred at the site the pond was estimated to have a capacity of approximately 1440m³ (1440kL), hence if water for processing is solely sourced from the basin, the

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		will not be required. If there is excess dirty water the EPA advises that the Proponent will need to investigate all practical alternatives to discharge and evidence must be provided on the assessment of alternatives. For example, potential options that could be considered individually, or in combination, could include (but are not limited to): • reducing the amount of wastewater generated; • reducing the contamination or generation of stormwater eg. by separating waste streams coming into the site and by separating areas with different risk profiles, by collecting oils and lubricants so they don't enter stormwater; • storing or using potential pollutants (especially fuels and toxic materials) in a manner that is isolated from stormwater and wastewater (eg. by roofing); and • discharging to the sewer (approval can be sought from Sydney Water to discharge industrial trade wastewater to the sewer). Please note that he EPA issued a Notice of Clean-up Action (No. 1518162) to Sell & Parker on 18 November 2013 preventing any discharge from the Premises to Breakfast Creek due to high levels of heavy metals & hydrocarbons in the water being discharged.	basin will be run dry within six days. There would therefore be a period in between receiving a rainfall event and restoring capacity to the basin where the site is at some risk of having a surplus of water where rainfall greater than the design capacity of the basin is received, that requires management to prevent inundation of the site or uncontrolled releases. A contingency in the form of a NSW EPA approved controlled discharge water quality criteria is required by the proponent so that in the event of extreme rainfall events or inability to have sufficient capacity restored to the basin prior to a storm event, surplus water can be sufficiently managed. ERM recommends that the basin is returned to between 0-10% capacity following any rainfall events through the use of the captured runoff as process water to limit the likelihood of potential issues from large volumes of water being held on-site following significant storm events. In addition to the management of basin capacity, the volume of stormwater generated will be reduced by the installation of rainwater tanks to capture 'clean' runoff that can be used in other process on-site (such as the flushing of toilets). The reduction in water volume reaching the basin as a consequence of the tanks will therefore reduce the total volume of water available to be treated or reused across the site. The incorporation of the mitigation measures listed for the vehicle processing area, the covering of the flock, installation of additional oil/water separators and the other measures outlined in the SWMP (ERM, 2014) will reduce the potential for contamination to enter the surface water runoff. The basin collects stormwater from the site, rather than contaminated wastewater from industrial processes. The disposal of stormwater to sewer is not a standard practice and is unlikely to be accepted by Sydney Water. The discharge of stormwater that meets NSW EPA approved criteria is a more sustainable alternative, allowing the management of the stormwater to occur at the source rather than off-site. Temporary liquid waste removal by vacuum trucks has been used to manage stormwater at the Site in the past. Whilst this is a useful, it is only a temporary measure, as it is considered unsustainable and unreliable to manage captured runoff during extreme storm events in the long term.

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			Potential for difficulties in receiving immediate responses to extreme storm events and the significant costs associated with utilising this method are restrictive, particularly as the water could be appropriately managed / treated on-site. Sell and Parker would like to pursue the development of water quality criteria to facilitate discharge from site in the event that there being a requirement to restore capacity exists due to extreme rainfall. ERM notes that during the process of developing the trigger levels and trialling the proposed treatment method, the current EPA requirement to not discharge from site will remain. Only when water quality meets the EPA approved discharge criteria will discharge be undertaken at the site. During this period, the water will continue to be used for processing and should an extreme storm event be likely, pumping into a vacuum truck and subsequent discharge to a licenced facility (should use of water in processing be insufficient to provide capacity in the basin). With the implementation of the contamination management measures above and those outlined in the SWMP (see *Annex J* of the EIS) water quality improvements are expected. Captured runoff water that is proposed for discharge could also be further managed by the use of flocculants (eg gypsum) to settle out entrained sediment (and potentially associated heavy metals), adjustment of pH and other measures. Daily monitoring of weather forecasts on reputable weather information providers on the internet will allow for Sell and Parker to initiate responses if extreme storm events are likely (such as ensuring that water ameliorants, sampling equipment and pumps are on stand-by and/or vacuum trucks are notified that they may be required). The steps for determining water quality discharge criteria were recently stepped out in a surface water sampling event undertaken by ERM and communicated to Andrew Reece via letter correspondence (letter dated 11 September 2014, Reference: *0226308_LO1_FINAL LETTER TO EPA.DOCX*).

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	Air Quality	The EPA has significant concerns in relation to air quality impacts from the proposed operation and requires additional information to make an adequate assessment of the likely impacts. The EPA's comments in relation to potential air quality issues are below: **Hammermill** The hammermill was labelled as the wet scrubber in the Air Quality Assessment (AQA) and characterised as a stack source with a diameter of 0.56 m and a height of 3 m. Photos were provided by the proponent showing the vent where odour monitoring was completed. From the photos provided, the hammermill appears to be near the incline conveyor (CV04). However, the location of the discharge stack (WSS01) modelled appears to be near the non-ferrous material drop area (TP05). It is uncertain whether the location of the hammermill where odour monitoring was undertaken is the same as the wet scrubber stack in the modelling. Therefore, the wet scrubber stack specifications for volumetric flow rate and particulate emission concentration used in the modelling may not be appropriate. EPA requires the Proponent to provide clarification that the characterisation and the emission rates used in the modelling for the wet scrubber is representative of the hammermill. **Oxy Cutting** As discussed in the meeting on 15 September 2014 with the proponent, there are several methods for the modelling of emissions from oxy cutting. The existing modelling characterises oxy cutting as a 1 m high stack source with a very low velocity (0.01 m/s) and diameter (0.05 m). The proponent explained that this was to simulate the point where the metal and the oxy cutter contact with a very low volumetric flow rate	The air quality modelling has been updated with the Wet Scrubber reclassified as a volume source and placed in the correct location which is adjacent to the Hammermill control room. Considering the photographs of the wet scrubber during odour sampling, the wet scrubber on the hammermill vents into a cavity area of the hammermill before rising due to thermal buoyancy to the atmosphere. Consequently, it was considered on re-review of these photographs that a volume source more properly described this source. Details of the parameters used to model the volume source are provided in *Table 4.2* and *Table 4.4* of the revised report. The location of the release point has been moved to be consistent with the location in which the sampling was taken. Please see *Figure 4.4* in the revised report which shows the revised location of the wet scrubber emission location. It should be noted that contribution from the hammermill changed only slightly at locations in close proximity to the hammermill at more distant locations, such as the residential sensitive receptors where the difference in predicted concentrations was negligible. A comparative analysis of modelling using a point source or a volume source has been included in the updated report (see *Annex D*). The results of the sensitivity analysis demonstrated that there are minor differences in representing emissions as either a point or volume source with similar concentrations predicted in both circumstances. On balance, it was considered that representation as a point source provides a more conservative assessment and this approach was therefore adopted for the

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		to account for the fact that it is a fugitive source. The results of the oxy cutting modelling indicate that the maximum concentration contours for 1-hour average NO_2, iron oxide fumes, manganese and copper dust appears to be on the adjacent site approximately 200 m west of the oxy cutting sources. The contours appear to go around the area where the oxy cutting source is located. There appears to be incongruities in the characterisation of the oxy cutting source for fugitive emissions to accumulate on the adjacent site, 200 m from the source. Whilst it is agreed that it is difficult to characterise a fugitive emission source like the oxy cutting process, based on the incongruities in the results of the modelling EPA requires the Proponent to undertake sensitivity testing of oxy cutting in the modelling for validation. **Toxic Air Pollutants** The AQA only assessed toxic air pollutants from the oxy cutting process. However, there is potential for other pollutants to be emitted in the hammermill during the shredding process. For example, the US EPA provides data for the speciation of fine particulates (PM2.5) from auto body shredding which includes iron, lead, chromium, zinc, chlorine, copper and magnesium and manganese. The AQA states that the Approved Methods toxic air pollutant criterion does not apply at the industrial estate which is untrue as the individual toxic air pollutant criteria applies at and beyond the boundary of a facility. The predicted iron oxide concentration from oxy cutting is above the EPA criterion at and beyond the boundary of the site. EPA requires the Proponent to assess other pollutants apart from dust and odour which may be emitted from the hammermill to be included in the AQA. In addition, as	main report. Toxic Air pollutants associated with $PM_{2.5}$ emissions from the Hammermill were included in the updated report as per EPA's suggestion. Details on these results may be found in *Section 5.2.5* of the updated report. It is noted that the results from this analysis indicates that contribution of toxic species identified by the Approved Methods and emitted from the Hammermill associated with $PM_{2.5}$. Concentrations of toxic air pollutants associated with the hammermill operation were reported below their relevant assessment criteria at all sensitive receptor locations (refer *Table 5.7* of the updated report)

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		discussed in Point 2, emissions from oxy cutting should be reviewed as the maximum impacts appear to be 200 m west of the source beyond the site boundary. **Dust and Odour** It is stated that the proposed increase in throughput capacity will result in decreased particulates emissions due to effective dust control measures and operational efficiencies yet no quantitative assessment of particulates from current operations has been conducted which would provide a means of objectively assessing the potential change in impact from existing site activities to the proposed expansion. EPA notes that whilst there is likely to be improvements to dust emissions from vehicular traffic due to the sealing of the site and the redirection of traffic flow, the major source of dust emission is from the hammermill and the associated processes. There will be no change to the location and the operation of the hammermill as result of the proposed expansion apart from operating at a higher throughput. The results of the modelling indicate that the worst predicted impacts are near the northwest corner of the site where the hammermill is located. The predicted 24-hour average PM10 criterion contour of 50 µg/m^3 appears to extend approximately 200 m beyond the boundary to the surrounding industrial receptors to the north and west of the facility. Similarly, the maximum odour contours extend beyond the northwest boundary of the site. EPA receives regular odour and dust complaints from neighbouring industrial facilities in the immediate vicinity to the Premises. With the proposal to significantly increase production on the Premises, this needs to be comprehensively assessed. The neighbouring industrial receptors are a place of work and should be included in the AQA as sensitive receptors. EPA	ERM has revised the modelling to account for mitigation of dust emissions from materials handling, receipt of materials and stockpiles through the use of water sprays. Sell & Parker have committed to this mitigation measure. Rather than model the current situation for dust generation which would be an unusual step, ERM has undertaken a Best Available Technology (BAT) analysis in comparison to the proposed operation. This approach was discussed with Ruby Kan of EPA on 7 November 2014 and agreed as an acceptable alternative approach. It is noted that for a Site of this type, the facility will adopt industry best practice for their operations in order to reduce emissions to atmosphere. There are however, residual impacts to the immediate surrounding land use from odour and dust. The surrounding land use is industrial in nature and whilst the Approved Methods considers a place of work as a Sensitive Receptor it is considered that an industrial estate should not be considered in the same light as a residence or a school. Land use planning is used to ensure a separation of industries from more sensitive land uses such as schools, hospitals and residences. Thus it is to be expected that ambient air quality in an industrial area, which permits a range of industrial land use activities, will be impacted to a greater extent by the industries within that area, particularly when compared to that of a residential area. The Site's located, within the centre of the industrial estate, also provides greater separation to the more sensitive residential uses. Moreover, it is considered that industrial uses do not have the same exposure profile as residential receptors, especially when it comes to PM_{10}

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		requires the Proponent to assess the existing and proposed impacts at the neighbouring industrial receptors as well as the residential receptors. Should there be any predicted exceedances of the EPA impact assessment criteria, a mitigation study needs to be conducted on all existing and proposed emission sources including fugitive emission sources. Any existing and proposed mitigation measures should be benchmarked against industry best practice. **Best Practice** A letter was provided by the designers of the hammermill, Danieli UK Holding Ltd, to state that the Water Injection System and acoustic enclosure is considered to be an improvement from the previous operations at the site. EPA considers key performance indicators to determine the effectiveness of control measures are an integral component of managing emissions from activities at an industrial site. The development and implementation of an Air Quality Management Plan can assist industries in setting key performance indicators and manage air quality impacts. EPA requires the Proponent to prepare a comprehensive best practice Air Quality Management Plan (AQMP) for the project. The AQMP may include but is not limited to: • Identification of all emission sources on the site including fugitive emission sources. • Identification of key performance indicators for the site. • Bench mark of all air quality mitigation measures on site with industry best practice. • Detailed procedures for the implementation of all air quality mitigation measures on site including the personnel responsible. • Comprehensive decommissioning procedures for vehicles to ensure no fuel or oils are left prior to the	or toxic air pollutants. Concentrations for PM_{10} and toxic air pollutants are designed for exposure 24-hours a day, 365 days a year for an entire lifetime. The exposure of people working in the surrounding industrial area may be exposed 8-10 hours a day, 5 to 6 days a week, 48 weeks a year for a working lifetime (30 years). Thus it is not appropriate to use the same criteria for industrial receptors as opposed to residential receptors. It is considered more appropriate to use Safe Work Australia guideline values, where they exist for the emitted species, for these industrial areas. Where this is undertaken the predicted maximum concentrations of toxic species are substantially below criteria. SafeWork Australia do not provide criteria of PM_{10} or for odour, however it is considered that the same approach should apply. Industrial land use is less sensitive than residential land use and thus expected standards are lower. Industries such as Sell & Parker are important industries, which make a valuable economic, social and environmental contribution, , and whilst they may produce odour impacts to surrounding areas this is acceptable in an industrial area. ERM has identified all emission points on-site within the air quality assessment. ERM has also updated the air quality assessment to provide a Best Available Technology assessment of the proposal. This assessment may be found in *Section 6* of the Air Quality report, which addresses EPA's concerns. Further, it is considered unreasonable that an AQMP be prepared prior to consent. Upon approval of the Project, Sell and Parker are committed to preparing a comprehensive AQMP, drawing on the mitigation measures outlined in the benchmarking study (refer Table 6.1 of the revised report) to form the basis of the management plan.

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		hammermill. • Records of any air quality events (e.g. odour and/or smoke complaints) and the type of feed being processed at the time of the event. • Regular review of mitigation measures on site based on the record of air quality events and evaluation of additional mitigation measures if necessary.	
NSW Office of Environment and Heritage	Aboriginal Heritage	We note that the exhibition material available to the public from your website contains information from the OEH Aboriginal Heritage Information Management System (AHIMS) web service. Due to the cultural sensitivity of the information from the OEH AHIMS web service, there are restrictions on how this information may be used, including: The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public. The document 'Appendix G: AHIMS Search Results ALL', available from the Department of Planning and Environment (DP&E) major projects register includes information that enables location of a registered AHIMS site. Please arrange for the version of Appendix G available from the major projects register to comply with the conditions of use of the AHIMS data. This would require removing the AHIMS search results entirely from the exhibition materials, or ensuring that the version of the document on the DP&E website does not contain any information (including descriptions, diagrams, coordinates or maps) that provide information about the location of any items of Aboriginal cultural heritage. OEH has reviewed the exhibition materials and has no other interest in this matter and no further need to be involved in the assessment of this project.	Upon review of the SSD Application on the DP&E Major Project Register on 20 November 2014, Appendix G has been removed to satisfy the conditions of use of AHIMS data.

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NSW Roads and Maritime Services	Traffic and Transport	Roads and Maritime Services (RMS) has reviewed the submitted information and provides the following comments to the Department for consideration: 1. It is noted that the details of the intersection modelling has not been provided to Roads and Maritime Services for review. The applicant needs to provide electronic copies of the Sidra models to RMS for review. 2. It seems the intersection of Sunnyholt Road/Vardys Road and Sunnyhold Road/Tattersall Road have been modelled in isolation. These two intersections are too close to each other and one intersection would impact on the performance of the other intersection. Therefore, these two intersection need to be modelled as coordinated intersections. 3. The assumptions for the traffic distribution need to be clearly stated and justified. Roads and Maritime required the above-mentioned information to assess the traffic impact of the development proposal.	GTA consultants have undertaken additional work to address the issues raised by the RMS, with responses to these issues provided below. *1. It is noted that the details of the intersection modelling has not been provided to Roads and Maritime Services for review. The applicant needs to provide electronic copies of the Sidra models to RMS for review.* In response to the first issue raised regarding the provision of electronic copies of the SIDRA models to the RMS, SIDRA 6 outputs are provided in *Annex C*. It should be noted that the results vary slightly to those presented in the GTA Report, as these were undertaken using version 5 of the SIDRA Intersection software. *2. It seems the intersection of Sunnyholt Road/Vardys Road and Sunnyhold Road/Tattersall Road have been modelled in isolation. These two intersections are too close to each other and one intersection would impact on the performance of the other intersection. Therefore, these two intersection need to be modelled as coordinated intersections.* The modelling assessment contained in the GTA Report was undertaken using SIDRA 5, which modelled each of the intersections in isolation. An updated assessment has now been undertaken using SIDRA 6 using the 'Network Model' function. The existing conditions outputs are summarised in *Table 1* with detailed results provided in Attachment 2 of the GTA Letter provided in *Annex C*. The modelling indicated that when modelled in a network, each of the existing intersections are approaching their theoretical capabilities. Post development outputs are summarised in *Table 2* with detailed results provided in Attachment 2 of the GTA letter provided in *Annex C*. The assessment indicates a marginal change to the operation of the intersection as a result of the development generated traffic. Further to the above, it is noted that the anticipated additional traffic generation through each of the intersection is one vehicle approximately every 2 minutes. This confirms that the level of additional traffic through each of the intersection will not have a noticeable impact on the operation

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			of both intersections 3. *The assumptions for the traffic distribution need to be clearly stated and justified.* As detailed in the GTA report provided as Annex M in the EIS the following distributions have been adopted: • Sunnyholt Road (north): 60% • Sunnyholt Road (south): 20% • Vardys Road (west): 20% These distributions have been applied to the additional traffic generation estimates for each peak period identified in the report (AM Peak Hour= 19 in/10 out, PM Peak Hour= 12 in / 38 out). There was a minor error in the GTA report when traffic was distributed onto the road network during the AM peak hour. The updated traffic distributions for the AM and PM (unchanged) peak hours are provided in Figure 1 and Figure 2 of the GTA letter provided in *Annex C.*
Sydney Water Corporation	Water	Sydney Water noted the following: • The drinking water main available for connection is the 300 mm main in Tattersall Road.	The Proponent acknowledges that the drinking water main available for connection is the 300 mm main in Tattersall Road.
	Wastewater	Sydney Water noted the following: • The proposed development can connect to the 225 mm wastewater main under WO 36324. • The proposed development site is traversed by wastewater mains. Where proposed works are in close proximity to a Sydney Water asset, the developer may be required to carry out additional works to facilitate	The Proponent acknowledges that Project can connect to the existing 225 mm wastewater main under WO 36324. With regards to proposed works in the vicinity of Sydney Water assets, measures will be implemented where required to avoid impacts to underground utility services. A suitably qualified underground service locater will be engaged where required to demarcate underground services with measures implemented to avoid obstruction and/or damage to the

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		their development and protect the wastewater main. Subject to the scope of development, servicing options may involve adjustment/deviation and or compliance with the Guidelines for building over/adjacent to Sydney Water assets. Refer to your WSC for details of requirements.	assets in accordance with the *Guidelines for Building over/adjacent to Sydney Water, Water and Waste Water Assets* (Sydney Water 2013)[1].
Power Plastics Pty Ltd.	• Traffic and Transport • Air Quality • Noise and Vibration	Letter Submission to the Proponent Our business, Power Plastics is located at 71 - 77 Tattersall Road, Kings Park approximately 100m to the west of the Sell and Parker business. We are a plastics manufacturing business producing containers for the food, pharmaceutical, household and industrial markets. It is important for the products we produce that we maintain a clean and dust free environment. For many years we have been affected by the operations of the Sell and Parker business however as they were here before we arrived we have not complained. We now note that they have submitted a DA to expand their site to which we are strongly opposed for the reasons below. 1. Insufficient parking on the existing Sell and Parker site. Trucks park along the front of our building (often illegally) causing a traffic hazard. 2. The traffic lights at the end of the street at Sunnyholt Road cannot cope with the current traffic loads due to the heavily loaded trucks that cause long delays leaving Tattersall Road via Sunnyholt Rd. 3. The road is constantly covered in metal debris from poorly	The proponent provides the following response to each of the issues raised. 1. *Insufficient parking on the existing Sell and Parker site. Trucks park along the front of our building (often illegally) causing a traffic hazard.* It is acknowledged that the current car parking availability is limited predominantly to off street parking as outlined in the EIS. In accordance with the provisions outlined in the *Blacktown City Council Development Control Plan 2006* (DCP), industrial developments are required to meet specific requirements regarding the provisions of car parking. Based on the DCP, the proposed development is required to supply 147 on-site car parking spaces to meet the minimum car parking requirements. The proponent is committed to providing on-site parking to meet this requirement and as a result, is likely to alleviate the current strain on available off-site parking. 2. *The traffic lights at the end of the street at Sunnyholt Road cannot cope with the current traffic loads due to the heavily loaded trucks that cause long delays leaving Tattersall Road via Sunnyholt Rd.* GTA Consultants were engaged at the request of the RMS to undertake additional traffic modelling at potentially affected intersections resulting from the proposed development. The results of the modelling indicate that the intersection of Tattersall Road/Sunnyholt Road there will be a potential increase of one vehicle approximately every 2 minutes. It is considered that this level of additional traffic through the intersection will not have a noticeable impact on the operation of the intersection.

[1] Sydney Water (2013). *Guidelines for Building over/ adjacent to Sydney Water, Water and Waste Water Assets*

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		covered trucks. 4. The road is constantly covered in mud and dirt from the site which turns into dust which blows into our site. 5. It is dangerous using the sidewalk due to poor vision of trucks coming and going from the site. 6. Trucks block the road when the line of trucks comes from the site out onto the street. 7. The road is badly damaged and pot holed due to the high truck traffic. 8. While waiting drivers regularly carry out repairs to their trucks out on the street leaving oil and debris behind. 9. Their process oozes smoke, dust and odours on a regular basis. 10. We have equipment that is sensitive to power supply interruptions. We suspect regular interruptions to our supply are caused by huge immediate power demands by their process. Over the years we have been subjected to loud explosions from the site. These explosions shake our windows and are frightening when they occur. Debris has also been blown from the site during these explosions although the frequency of the explosions has reduced. We also draw your attention to the recent changes to the LEP that has deemed this area as moving to light industrial in the future. An approval of the DA would totally go against this adopted LEP. While Sell and Parker have been located in Tattersall Road for many years it is now very obvious that the area has developed and a heavy industrial business such as theirs is out of place. In	3. *The road is constantly covered in metal debris from poorly covered trucks.* As outlined in *Section 6.13.8* of the EIS, all waste transported to and from the site is to be done so in accordance with road and transport legislation. The proponent is committed to engaging appropriately licenced contractors to transport waste and other material and to ensure it is adequately covered during transport. 4. *The road is constantly covered in mud and dirt from the site which turns into dust which blows into our site.* Please refer to our response to the third issue raised. 5. *It is dangerous using the sidewalk due to poor vision of trucks coming and going from the site.* As outlined in *Section 6.10.3* of the EIS, the increase of the operational area at the expanded site will permit heavy vehicles to layover on-site in between weighing events, removing the need for these vehicles to return to Tattersall Road between the loading and unloading of metal. This change is expected to reduce the movement of heavy vehicles from the site onto Tattersall Road and improve the safety for pedestrians. Further, the existing vehicle access ways to the site are 7 metres wide, which is consistent with the requirements outlined in the *Blacktown Development Control Plan 2006.* 6. *Trucks block the road when the line of trucks comes from the site out onto the street.* Please refer to our response to the fifth issue raised. 7. *The road is badly damaged and pot holed due to the high truck traffic.* Whilst the Proponent acknowledges your concern regarding the damage to the surrounding road network, the pot holes are likely attributable to the cumulative use of the road associated with nearby business and other general users of the surrounding road network. Combined with general

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		our opinion, to allow them to expand this business would be a poor decision.	wear and tear, weather events and the high level of users of Tattersall Road which carries approximately 6000 vehicles per day (and is a B Double heavy vehicle route), it is challenging to imply that the observed damage is caused solely by operations undertaken by the Proponent. 8. *While waiting drivers regularly carry out repairs to their trucks out on the street leaving oil and debris behind.* As discussed in the Proponent's response to the fifth issue raised, it is anticipated there will be a reduction in heavy vehicles waiting on Tattersall Road due to the increased capacity for heavy vehicles to layover within the site due to the increase in the operational area supported by the expansion. 9. *Their process oozes smoke, dust and odours on a regular basis.* A revised air quality assessment (see *Annex D*) was prepared to address specific requests from the EPA (refer to their comments above). Key results based on the air quality modelling include: • Annual mean concentrations of Total Suspended Particulates (TSP) and dust deposition were below the assessment criteria outlined in the Approved Methods at all residential sensitive receptor locations; • Annual mean concentrations of particulate matter with a diameter of 10µm or less (PM10) was below the assessment criteria outlined in the Approved Methods at all sensitive receptor locations; • Concentrations of chromium, lead and nickel were below the assessment criteria outlined in the Approved Methods at all sensitive receptor locations; • Concentrations of odour were generally below the assessment criteria outlined in the Approved Methods. Two sensitive receptor (industrial) locations located immediately adjacent to the Site reported peak 99th percentile odour concentrations above the assessment criteria. Given the location of these premises as shown as receptor location 13 and 20 in Figure 2.3 of the revised air quality assessment provided in *Annex D*, it is considered that the amenity impacts of this nature are acceptable within an industrial estate as this is the purpose of setting aside land for industrial

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			rather that for residential use; and • Annual mean concentrations of NO_2 were below the assessment criteria outlined in the Approved Methods at all sensitive receptor locations. 10. *We have equipment that is sensitive to power supply interruptions. We suspect regular interruptions to our supply are caused by huge immediate power demands by their process.* It is considered that current operation undertaken at the site would not impact on the power demands of the surrounding properties. Should this issue continue to occur, the Proponent would be happy to discuss further or consult with the energy provider. In relation to your queries regarding the *Draft Blacktown Local Environment Plan 2013*, please refer the Page IV of the EIS (extract below) pertaining to its relevance to the proposed development. *The proposal is permissible pursuant to the provisions of Blacktown Local Environmental Plan (LEP) 1988, which zones the site '4(a) General Industrial'. The Draft Blacktown LEP 2013 proposes a 'B7 Business Park' zone for the site, to which the proposed expansion would be prohibited development under the Draft LEP. Blacktown City Council held a meeting on 12 March 2014, to hear a motion regarding making further amendments to the Blacktown Draft LEP, prior to its referral to DP&I. The amendments which were adopted by Council have the effect of amending the proposed zoning of the subject site and surrounds from B7 (as proposed in the publicly exhibited Blacktown LEP) to an IN1 General Industrial zone. The motion passed by Council has the effect of making the proposed development permissible with consent under the IN 1 General Industrial zone, under draft Blacktown LEP.* We trust the Proponents comments address your issues raised.

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Christmas Services Australia, Kings Park NSW	Traffic and Transport	We are a large warehouse located in Melissa Place Kings Park and are located directly behind Kings Park Waste Metal Recycling Facility in Tattersall rd. At Present we have approx 20-30 heavy vehicles double parked in our street and queuing to gain access into the Metal Recycling Facility for hours on end. At times we even have problems accessing our driveway with our own vehicles. There is no traffic management system whatsoever that I am aware of being used by the Kings Park Waste Metal Recycling Facility. The Kings Park Waste Metal Recycling Facility is greatly impacting on Tattersall Rd and Melissa Place through trucks using these roads as parking stations and thoroughfares. Any Increase would greatly affect our area further making it impossible to conduct business ie receiving and sending Freight via road transport etc etc. We strongly oppose Expansion.	The proposed development will involve an increase in the operational area within the site, resulting in additional capacity to support heavy vehicles waiting to access the site. Given this, it is anticipated that there will be an overall reduction in heavy vehicles utilising surrounding streets (including Melissa Place) whilst waiting to unload material. This anticipated reduction in heavy vehicles utilising Melissa Place would likely result in a positive impact on the freight operations currently undertaken by this business.

Annex B

REVISED SUMMARY OF MITIGATION MEASURES

Table B.1 Summary of Mitigation Measures

Issue	Potential Impact	Mitigation/ Management Measure
Ecology	The overall potential ecological impacts are considered low given the highly disturbed nature of the site. Only landscape trees separating the two current separate sites require removal. Potential impacts to threatened species are considered highly unlikely.	The following recommendations aim to minimise ecological impacts of the proposed works: • sediment control barriers will be installed at the site during construction and while earthworks are undertaken to reduce the likelihood of silted runoff into adjacent Breakfast Creek in the event of high rainfall; • all vehicles are to keep to the existing and proposed access roads on-site at all times; and • all work should be undertaken to prevent the spread of pests and noxious weeds in accordance with the Noxious Weeds Act 1993 and the Noxious and environmental weed control handbook - A guide to weed control in non-crop, aquatic and bushland situations (NSW Government, 2011).
Heritage (Indigenous)	Potential impacts to previously unknown indigenous artefacts or relics during ground disturbance activities.	In accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW NSW, 2010) a conservative approach will be adopted at the site. The following mitigation measures will be implemented: • all staff, contractors and others involved in the construction works would be made aware of the statutory legislation protecting sites and places of heritage significance; and • all works would cease in the immediate area should any indigenous artefacts or relics be uncovered and the Cultural Heritage Division of the NSW National Parks and Wildlife Service (OEH) contacted.
Heritage (Historical)	Potential impacts to previously unknown items of historical significance during ground disturbance.	The following mitigation measures are recommended to ensure that if any historical heritage artefacts are encountered appropriate measures are implemented: • all staff, contractors and others involved in the works would be made aware of the statutory legislation protecting sites and places of heritage significance prior to works commencing; and • in the event that a site or artefact (as defined by the National Parks and Wildlife Act 1974 or Heritage Act 1977) is identified during construction works, works shall cease at the location. The find shall be immediately reported to the regulator in accordance with legislation. No work shall commence in the vicinity of the find until any required approvals have been given by the regulator.
Acoustics	Noise and vibration impacts to nearby commercial premises during construction and operation.	The following acoustic screen fencing is proposed to mitigate noise emissions from site operations to neighbouring existing and proposed new industrial premises: • retain the existing acoustic screen fencing at a height of 4m, which is currently erected around the existing site northern and western boundary and along existing driveways as shown on the site drawings; and • proposed new metal/colorbond and electric fence along the new eastern boundary shall be an acoustic screen fencing of 4m height In addition to the above, the noise screen will be designed with regard to the following: • the extent of noise reduction required of the noise screen as a whole as perceived from any potentially

Issue	Potential Impact	Mitigation/ Management Measure
		affected receiver sites; • any penetrations through the fabric of the noise screen will be sealed air tight; • all joints between noise screen panels will be sealed air tight; and • noise screens will have no clearance gaps underneath them.
Air Quality	Potential localised air quality impacts associated with increased concentrations of TSP at nearby commercial and residential locations.	The following mitigation measures will be implemented to manage potential localised air quality impacts during construction and operation: • vehicles and equipment shall be maintained in accordance with the manufacturer's specifications; • additional site fencing located on the eastern boundary of the site, should include appropriate dust screen to minimise airborne dust movements; and • all surplus soils from excavations during construction, not reused on-site, shall be removed from site by covered trucks and disposed of at an appropriately licensed facility.
Greenhouse Gas	Release of GHG emissions into the atmosphere. Based on the GHG assessment undertaken indicate that GHG emissions associated with the upgrade would represent an increase of 0.006% on Australia's national GHG emissions in 2010/11 of 563.1 Mt CO2-e, which is considered negligible.	Efficiency measures which will be implemented to manage GHG emissions during construction and operation include: • the site will be sealed, which will reduce the emission of GHGs from the mobile materials handling equipment due to a more consistent driving surface and the ability to select more direct routes across the site; • the new site design no longer requires trucks to enter the site twice but allows for one main entrance and exit point, reducing the kilometres travelled by trucks; • the increased throughput allows for efficiencies due to the economy of scale; • additional equipment purchased for the upgrade will conform to the standards of the latest technology including installation of conveyors to move material after processing rather than by FEL or truck; • post-upgrade the site has an additional capacity to recover ferrous and non-ferrous materials from the recycling processes, decreasing the need for end users to source raw materials from the extraction industries; and • where possible, the site will strive to continually improve the energy efficiency of its process and operations by implementing electricity and cost saving measures.

Issue	Potential Impact	Mitigation/ Management Measure
Soil and Water	Potential impacts include: • accidental release/spillage of contaminants and wastewater generated on-site; • earthworks resulting in potential erosional impacts; and • impacts to water balance as a result of the expansion	To manage and control stormwater, the following mitigation measures are proposed: • installation of two oil/water separators for the new drainage system within the existing and expanded site area; • regular cleaning of the oil/water separators should be carried out to maintain performance; • the existing network of underground stormwater pipes, inlets and oil water separators will be cleaned and, if damaged, replaced during the site refurbishment activities; • a bioretention filter will be installed to receive runoff from overland flows and the underground pipe network on the expanded site area; and • the existing stormwater pond on the existing site will be dredged and excavated to remove any contaminated sediments and lined with clay. Verification sampling will be required as will waste classification sampling to allow for the appropriate disposal of any dredged material. The general principles to be applied to erosion control for the disturbed site include: • plan for erosion and sediment control and assess site constraints during the design phase and before any earthworks begin; • minimise the area of soil disturbed and exposed to erosion; • control water flows from the top of and through the project area – divert up-slope 'clean' water away from disturbed areas and ensure concentrated flows are below erosive levels; • rehabilitate disturbed lands quickly; and • maintain erosion and control measures for the duration of the project and until the site is successfully rehabilitated. Key sediment controls include: • protecting stormwater inlets; • constructing a wheel wash; • creating stabilised site access points; • managing stockpiles; and • utilising sediment traps such as sediment fence during construction. Pollution control methods will include: • storage of chemicals within impervious bund of more than 110% of the largest container within the bund; • Material Safety Data Sheets (MSDS) for all chemicals stored on-site and made available to site personnel; • refuelling to occur away from drainage points, with drip trays used and spill kits available; and • trade waste receptacles will be provided for the storage and disposal of all wastes generated on-site.

Issue	Potential Impact	Mitigation/ Management Measure
		To minimise the use of potable water associated with the expansion of the site, the following measures should be implemented: • on-going use of collected runoff in the stormwater basin for operation requirements is recommended, as long as the water is of a quality such that impacts to site infrastructure, the surrounding environment and the health and safety of employees is avoided; • rainwater tanks may also be installed to utilise the runoff from roof spaces and would likely be best suited to providing water for personal use such as toilet flushing, reducing the requirement for mains supplied potable water.; • landscaped areas along the south boundary will include a range of locally endemic species to enhance the portion of the riparian corridor inside the operational boundary of the redeveloped site.
Contaminated Land	Potential risks to human health and the environment resulting from exposure to historical contamination during ground intrusive works.	The following management measures will be employed to manage potential exposure to contaminants during construction and operation: • a contingency for the appropriate management of potential unexpected contamination finds should be incorporated in the Construction Environmental Management Plan (CEMP) for the planned redevelopment of both properties; • if localised contaminated soils are encountered during construction works, they shall be segregated and assessed for waste classification and appropriately disposed of or re-used onsite, subject to the results of testing; • if significant contamination is encountered during construction works, further investigation in the form of a Phase 1/2 Environmental Site Investigation (ESA) may be required; • any imported fill must be certified at source location (e.g. quarry or property owner) as Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) in accordance with the Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment (Waste) Regulation 2005 (POEO Waste Regulation); • all pollution incidents that threaten or harm the environment shall be reported immediately to relevant authorities in accordance with the Protection of the Environment Operations Act 1997 (POEO Act); and • a Hazardous Materials Register and respective Safety Data Sheets (SDSs) shall be kept on site at all times and regularly maintained. In relation to the management of oil, lubricants and other material during operations hammermill operations, the following management measures will be applied: • vehicles are to be adequately drained prior to coming on the site, if possible, to minimise the requirement for on-site processing. If fluids are present processing must occur prior to recycling the

Issue	Potential Impact	Mitigation/ Management Measure
		vehicle; • immediately after receiving a car on-site it should be confirmed that the fluid containing components have been drained/removed and that no leaks are present. If fluid containing components remain or leaks identified place drip trays and seal leaking pipes; • vehicle processing area is to be bunded to provide additional protection in the event of spills or overflows; • clean up spills within in the bunded area (and across the site more broadly) immediately to prevent interaction with water; • ensure all fluids drained from vehicles are stored in appropriate, labelled containers to avoid the potential for cross contamination; • always use funnels when transferring fluids to limit the potential for spillage; • flock management – if vehicles (and other scrap metals) still contain hydrocarbons or other contaminants there is potential for contamination of the flock. Ensure that it is stored on hardstand, roofed location, with bunding to prevent entry of rainwater and upslope runoff; • remove batteries and battery cable ends (that are often also constructed from lead); • fuel filters to be removed and stored in a leak proof container; • separate other fluids such as brake fluids, coolants, air conditioning fluid, window washing fluid, prior to recycling the vehicle; and • spill kits to be stored and maintained in the car handling location.
Hazards and Risks	Potential off-site impacts include fatality, human injury or damage to property caused from activities undertaken at the site.	• at least one hose reel and one fire extinguisher be provided for the oxygen and LPG cylinder storage (AS 4332-2004, Table 7.2). This is based upon the 3,000 L of oxygen in the store. • provide one powder type extinguisher and one foam extinguisher for all bulk class 3 dangerous goods on site. This includes the storage of fuel and oil removed from vehicles prior to shredding. This recommendation assumes the recovered liquids are stored in intermediate bulk containers. • maintain the height of the floc stockpile to less than 4 m, or the total volume to less than 1000 m3. This ensures the warehouse in which the floc is stored will not be a high hazard occupancy. • continue with the practice of providing water cannons to provide reach to feed and processed stockpiles in the event of a fire in any stockpile.
Fire and Incident	Floc material has been identified as a potential source of fire. Any uncontrolled leaks or spills have the	The recommendations made in regards to fire protection requirements as detailed above will be implemented To ensure incidents such as accidental spills and / or leakages from machinery are contained and managed appropriately, the following measures will be implemented.

Issue	Potential Impact	Mitigation/ Management Measure
	potential to contaminate soils within unsealed sections of the site, or be entrained in stormwater flow to the detention basin at the rear of the site. Overflow of potentially contaminated water from the detention basin, has the potential to detrimentally impact on Breakfast Creek.	• the site will be kerbed to retain spillages or stormwater run-off, which outflow via a detention basin. The detention basin has a capacity of 1440 m3. This basin will be required to be managed in accordance with the measures identified in Section 6.6). • spill kits will be available on-site and be deployed to manage and contain minor spills; • all pollution incidents that threaten or harm the environment shall be reported immediately to relevant authorities in accordance with POEO Act. • It is recommended that a Fire and Incident Response Management Plan, including but not limited to the mitigation measures above, be developed for the expanded site. Sell and Parker have an existing Emergency Response Plan, this may be updated to include the aforementioned information.
Traffic and Transport	Compared against the existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development is considered negligible and is not be expected to compromise the safety or function of the surrounding road network.	• a site-specific construction traffic management plan (CTMP) will be prepared prior to works commencing on-site. This is to outline construction traffic volumes, truck routes, access arrangements and construction worker parking arrangements.
Social and Economic Resources	The proposed development presents an overall positive impact to the local community in terms of employment opportunities and indirect contributions to the local community.	The following measures should be implemented to ensure positive socio-economic impacts of the proposed developed are maximised: • seek to utilise local available labour force when recruiting for additional employees, including where possible those that have been affected by job losses at the Dexion site; • where possible, investigate opportunities for offering apprenticeships for new work force and offer additional training to current workforce; • communicate to local business and community the expected start date of construction; and • any complaints received relating to site operations are to be recorded and attended to promptly.
Visual Amenity	The proposed development will not result in significant visual impacts in the vicinity of the site or neighbouring areas	Whilst visual amenity impacts associated with the proposed development are considered negligible the following management measure will be implemented: • native trees, shrubs and grass species will be planted along site boundaries, particularly the frontage with Tattersall Road, which will complement and enhance existing landscaped vegetation in accordance with the Landscape Concept Plan provided in Annex M.
Waste Management	Potential impacts include: • excessive waste being directed to	• all waste transported to and removed from the site should be done so in accordance with road and transportation legislation;

Issue	Potential Impact	Mitigation/ Management Measure

	landfill;
	• various types of waste being generated and stored onsite, with the potential for misclassification;
	• contaminated waste not being correctly stored or disposed;
	• off-site impacts to soil and/or water and/or groundwater.
		• in all cases, appropriately licenced transport contractors are to be engaged to transport waste material to and from the site. The contractors appointed to transport waste are to ensure they:
		  • are licenced to transport the type of waste they receive;
		  • transport the waste to a licenced facility capable of receiving the type of waste and quantity they are carrying;
		  • waste is adequately covered during transport; and
		  • the contractor transporting the waste is to ensure that completed waste data forms are provided to the waste facility upon arrival
		• the designated site manager or an appointed responsible delegate should prepare monthly reports clearly documenting the waste that has been received and generated. These should be prepared using waste receipts that have been retained and should include:
		  • waste classification data to assess compliance with the DECCW (2009) *Waste Classification Guidelines;*
		  • a review of licences held by the facilities where waste has been disposed to assess/ ensure their ability to accept the waste in accordance with relevant legislation; and
		  • include any incident reports relating to waste (i.e. spills) which have occurred over that month. Any corrective actions undertaken should also be included.
		• all waste materials which meet the specification to be reused/ recycled will be processed on-site or be taken to an approved facility, capable of accepting those materials.
		• all other waste is to be disposed in accordance with the classification of the waste material at an approved licenced facility.

Annex C

ADDITIONAL TRAFFIC INFORMATION

GTAconsultants

Reference: #15S1269000

27 November 2014

Sell and Parker
PO Box 755
MATRAVILLE NSW 2036

Attention: Mr. Nigel Fox (General Manager Property & Development)

Dear Nigel,

RE: KINGS PARK WASTE METAL RECYCLING FACILITY 23-43 TATTERSALL ROAD AND 45 TATTERSALL ROAD, KINGS PARK RESPONSE TO RMS CORRESPONDENCE

The following sets out a response to the RMS correspondence from Gordon Trotter (dated 10 October 2014) regarding the proposed Development Application for the Kings Park Metal Recycling Site. The RMS correspondence has been provided as Attachment 1 of this letter, with each of the RMS comments provided below (in bold) and responded to thereafter.

The following should be read in conjunction with the GTA report previously prepared for the site *'Kings Park Waste Metal Recovery, Processing and Recycling Facility: Transport Impact Assessment'* dated 13 March 2014.

"1. It is noted that the details of the intersection modelling has not been provided to Roads and Maritime for review. The applicant needs to provide electronic copies of the SIDRA models to Roads and Maritime for review."

The SIDRA INTERSECTION 6 outputs are attached to this letter (the electronic files have also been attached as part of this package). It is noted that the results vary slightly from those presented in the GTA Report, as these were undertaken using version 5 of SIDRA INTERSECTION. Version 6 has now been used to address RMS Comment #2 (see below discussion).

"2. It seems the intersections of Sunnyholt Road / Vardys Road and Sunnyholt Road / Tattersall Road have been modelled in isolation. These two intersections are too close to each other and one intersection would impact the performance of the other intersection. Therefore, these two intersections need to be modelled as coordinated intersections."

The modelling assessment contained in the GTA report was undertaken using SIDRA 5, which modelled each of the intersections in isolation. An updated assessment has now been undertaken using SIDRA INTERSECTION 6 using the 'Network Model' function. The existing conditions outputs are summarised in Table 1, with the detailed results provided in Attachment 2.

25YEARS

melbourne
sydney
brisbane
canberra
adelaide
gold coast
townsville
perth

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CHATSWOOD NSW 2067
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Table 1: SIDRA INTERSECTION 6 Modelling Results – Existing Conditions

Intersection	Peak Hour	Degree of Saturation (DOS)	Average Delays (secs)	95th Percentile Queue Length (m)	Level of Service (LOS)
Sunnyholt Rd / Vardys Rd	AM	1.00	57	505	E
	PM	0.85	42	261	C
Sunnyholt Rd / Tattersall Rd	AM	0.68	8	74	A
	PM	0.74	9	152	A

The modelling indicates that when modelled in a network each of the existing intersections are approaching their theoretical capacities.

The post development outputs are summarised in Table 2, with the detailed results provided in Attachment 2.

Table 2: SIDRA INTERSECTION 6 Modelling Results – Post Development

Intersection	Peak Hour	Degree of Saturation (DOS)	Average Delays (secs)	95th Percentile Queue Length (m)	Level of Service (LOS)
Sunnyholt Rd / Vardys Rd	AM	1.00	59	529	E
	PM	0.87	42	261	C
Sunnyholt Rd / Tattersall Rd	AM	0.68	8	77	A
	PM	0.77	11	192	A

The assessment indicates a marginal change to the operation of the intersections as a result of the development generated traffic.

Further to the above, it is noted that the anticipated additional traffic generation through each of the intersections is one vehicle approximately every 2 minutes. This confirms that the level of additional traffic through each of the intersections will not have a noticeable impact on the operation of both intersections.

"3. The assumptions for the traffic distribution need to be clearly stated and justified."

As detailed in the GTA report the following distributions have been adopted:

- Sunnyholt Road (north): 60%
- Sunnyholt Road (south): 20%
- Vardys Road (west): 20%

These distributions have then been applied to the additional traffic generation estimates for each peak period identified in the report (AM Peak Hour = 19 in / 10 out, PM Peak Hour = 12 in / 38 out).

There was a minor error in the GTA report when the traffic was distributed onto the road network during the AM peak hour. The updated traffic distributions for the AM and PM (unchanged) peaks hours are provided below.

Figure 1: AM Peak Hour Traffic Volumes – Existing (+Additional)

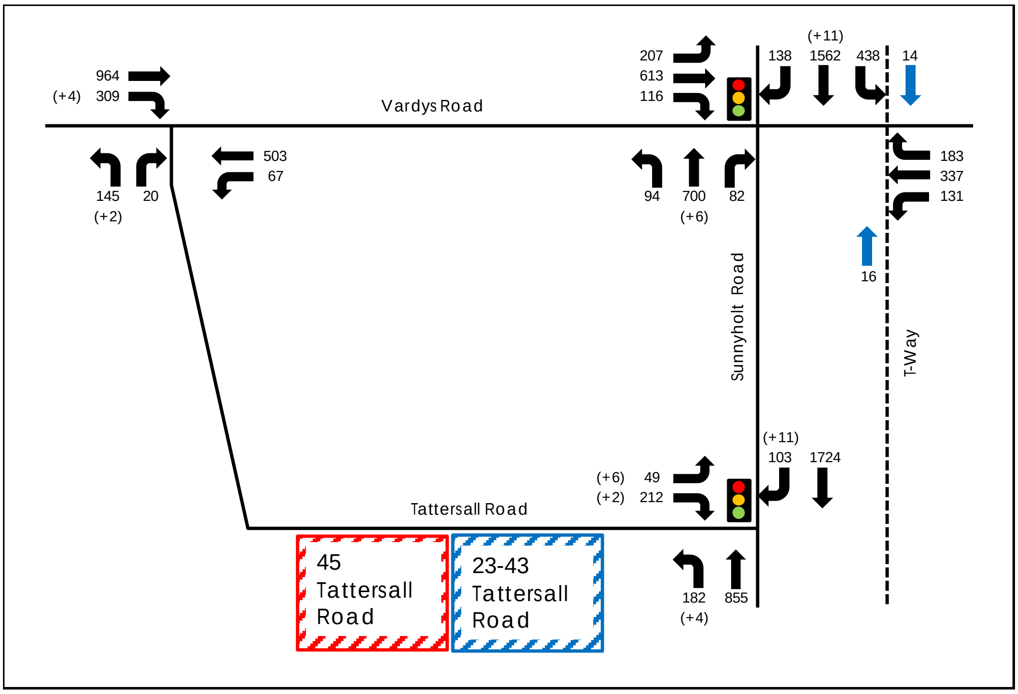
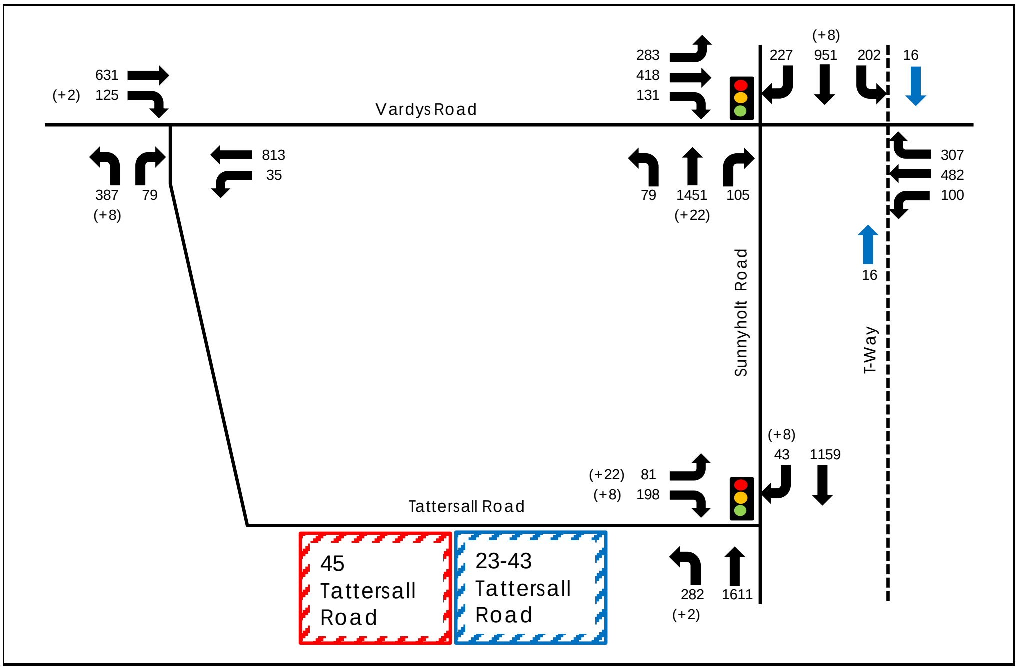


Figure 2: PM Peak Hour Traffic Volumes – Existing (+Additional)



I trust that the above meets your requirements for the time being and responds adequately to each of the RMS queries. Naturally, should you have any questions or require any further information, please do not hesitate to contact me in our Sydney office on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS

Ken Hollyoak
Director

encl.

Attachment 1

RMS Correspondence

Transport
Roads & Maritime Services

10 October 2014

Our Ref: SYD14/00312/02
Your Ref: SSD-5041 (SSD 6176)

A/Team Leader
Industry, Key Sites and Social Projects
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Ashley Cheong

Dear Sir/Madam,

KINGS PARK WASTE METAL RECYCLING FACILITY
23-43 TATTERSALL ROAD AND 45 TATTERSALL ROAD, KINGS PARK

Reference is made to the Department's correspondence dated 26 August 2014 regarding the abovementioned development application which was referred to Roads and Maritime Services for comment.

Roads and Maritime has reviewed the submitted information and provides following comments to the Department for its consideration:

1. It is noted that the details of the intersection modelling has not been provided to Roads and Maritime for review. The applicant needs to provide electronic copies of the SIDRA models to Roads and Maritime for review.

2. It seems the intersections of Sunnyholt Road/Vardys Road and Sunnyholt Road/Tattersall Road have been modelled in isolation. These two intersections are too close to each other and one intersection would impact on the performance of the other intersection. Therefore, these two intersections need to be modelled as coordinated intersections.

3. The assumptions for the traffic distribution need to be clearly stated and justified.

Roads and Maritime requires the abovementioned information to assess the traffic impact of the development proposal.

Any inquiries in relation to this matter can be directed to Pahee Rathan on 8849 2219.

Yours faithfully

Gordon Trotter
Manager Land Use Assessment
Network & Safety

Attachment 2

SIDRA INTERSECTION 6 Results

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Tattersall Rd (Ex-AM) **Network: Existing AM**

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Tattersall Road
Existing AM
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles														
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	192	12.1	192	12.1	0.565	11.0	LOS A	9.2	70.1	0.27	0.40	51.9
2	T1	900	10.2	900	10.2	0.565	3.5	LOS A	9.2	70.1	0.19	0.23	52.7
Approach		1092	10.5	1092	10.5	0.565	4.8	LOS A	9.2	70.1	0.20	0.26	52.5
North: Sunnyholt Road - N													
8	T1	1815	5.2	1815	5.2	0.676	0.8	LOS A	3.6	26.1	0.06	0.06	59.2
9	R2	108	6.8	108	6.8	0.376	21.1	LOS B	3.9	28.6	0.54	0.73	43.7
Approach		1923	5.3	1923	5.3	0.676	2.0	LOS A	3.9	28.6	0.09	0.10	58.0
West: Tattersal Road - W													
10	L2	52	38.8	52	38.8	0.525	59.9	LOS E	9.2	74.2	0.94	0.81	20.6
12	R2	223	6.6	223	6.6	0.525	58.0	LOS E	9.2	74.2	0.92	0.80	30.3
Approach		275	12.6	275	12.6	0.525	58.3	LOS E	9.2	74.2	0.92	0.80	28.8
All Vehicles		3289	7.6	3289	7.6	0.676	7.6	LOS A	9.2	74.2	0.20	0.21	52.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	8.2	LOS A	0.1	0.1	0.34	0.34
All Pedestrians		105	36.3	LOS D			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Vardys Rd (Ex-AM) — **Network: Existing AM**

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Vardys Road
Existing AM
Signals - Fixed Time   Coordinated   Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	99	13.8	99	13.8	0.844	60.0	LOS E	28.3	216.8	0.98	0.93	30.9
2	T1	743	10.9	743	10.9	0.844	55.2	LOS D	28.3	216.8	0.97	0.92	31.5
3	R2	93	25.0	93	25.0	0.618	83.7	LOS F	3.2	25.9	1.00	0.77	25.3
Approach		935	12.6	935	12.6	0.844	58.5	LOS E	28.3	216.8	0.97	0.90	30.7
East: Vardys Rd - E													
4	L2	138	6.9	138	6.9	0.363	51.5	LOS D	7.7	57.0	0.90	0.79	22.5
5	T1	355	6.5	355	6.5	0.553	57.8	LOS E	11.2	83.0	0.97	0.79	31.1
6	R2	193	6.0	193	6.0	0.688	77.7	LOS F	6.8	50.1	1.00	0.83	26.6
Approach		685	6.5	685	6.5	0.688	62.1	LOS E	11.2	83.0	0.96	0.80	28.4
North: Sunnyholt Road - N													
7	L2	467	3.8	467	3.8	0.498	17.7	LOS B	11.3	81.1	0.53	0.73	45.7
8	T1	1651	4.4	1651	4.4	0.959	46.9	LOS D	69.8	505.3	0.77	0.87	24.2
9	R2	145	20.3	145	20.3	0.157	45.8	LOS D	3.7	30.3	0.79	0.74	33.9
Approach		2263	5.3	2263	5.3	0.959	40.8	LOS C	69.8	505.3	0.72	0.83	29.4
West: Vardys Rd - W													
10	L2	218	14.5	218	14.5	0.283	27.9	LOS B	8.7	68.6	0.66	0.75	40.1
11	T1	645	5.4	645	5.4	1.002	111.0	LOS F	30.8	225.7	1.00	1.25	21.5
12	R2	122	15.5	122	15.5	0.929	94.5	LOS F	9.9	78.6	1.00	1.04	15.1
Approach		985	8.7	985	8.7	1.002	90.6	LOS F	30.8	225.7	0.92	1.11	23.4
All Vehicles		4868	7.5	4868	7.5	1.002	57.3	LOS E	69.8	505.3	0.84	0.90	27.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	61.4	LOS F	0.2	0.2	0.94	0.94
P2	East Full Crossing	53	33.4	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	52.4	LOS E	0.2	0.2	0.87	0.87
All Pedestrians		158	49.1	LOS E			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Tattersall Rd (Ex-PM)

Network: Existing PM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Tattersall Road
Existing PM
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	297	4.6	297	4.6	0.744	11.7	LOS A	21.1	152.2	0.35	0.44	51.7
2	T1	1702	3.5	1702	3.5	0.744	4.3	LOS A	21.1	152.2	0.27	0.30	51.7
Approach		1999	3.6	1999	3.6	0.744	5.4	LOS A	21.1	152.2	0.28	0.32	51.7
North: Sunnyholt Road - N													
8	T1	1226	7.2	1226	7.2	0.462	2.1	LOS A	4.1	30.6	0.11	0.10	58.0
9	R2	45	7.0	45	7.0	0.442	28.2	LOS B	2.0	15.0	0.64	0.75	40.3
Approach		1272	7.2	1272	7.2	0.462	3.0	LOS A	4.1	30.6	0.13	0.12	57.1
West: Tattersal Road - W													
10	L2	85	9.9	85	9.9	0.629	62.0	LOS E	9.2	69.0	0.96	0.83	20.0
12	R2	208	6.1	208	6.1	0.629	58.8	LOS E	9.2	69.0	0.93	0.81	30.1
Approach		294	7.2	294	7.2	0.629	59.7	LOS E	9.2	69.0	0.94	0.81	27.7
All Vehicles		3564	5.2	3564	5.2	0.744	9.0	LOS A	21.1	152.2	0.28	0.29	49.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	8.2	LOS A	0.1	0.1	0.34	0.34
All Pedestrians		105	36.3	LOS D			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Vardys Rd (Ex-PM)

Network: Existing PM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Vardys Road
Existing PM
Signals - Fixed Time   Coordinated   Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	83	12.7	83	12.7	0.851	23.1	LOS B	36.1	261.1	0.73	0.70	45.1
2	T1	1534	3.3	1534	3.3	0.851	16.6	LOS B	36.1	261.1	0.69	0.65	47.1
3	R2	117	10.8	117	10.8	0.361	73.9	LOS F	3.7	27.1	0.98	0.75	27.2
Approach		1734	4.3	1734	4.3	0.851	20.7	LOS B	36.1	261.1	0.71	0.66	44.8
East: Vardys Rd - E													
4	L2	105	7.0	105	7.0	0.245	47.2	LOS D	5.5	41.1	0.85	0.76	23.8
5	T1	507	4.8	507	4.8	0.854	70.2	LOS E	18.6	135.3	1.00	0.97	28.2
6	R2	323	3.3	323	3.3	0.831	79.4	LOS F	11.8	85.2	1.00	0.93	26.3
Approach		936	4.5	936	4.5	0.854	70.8	LOS F	18.6	135.3	0.98	0.93	27.1
North: Sunnyholt Road - N													
7	L2	219	7.2	219	7.2	0.345	40.6	LOS C	9.3	67.4	0.69	0.76	35.4
8	T1	1007	7.1	1007	7.1	0.637	24.1	LOS B	23.4	173.2	0.64	0.57	34.1
9	R2	239	10.6	239	10.6	0.807	80.8	LOS F	8.8	66.9	1.00	0.90	25.7
Approach		1465	7.7	1465	7.7	0.807	35.8	LOS C	23.4	173.2	0.71	0.65	31.8
West: Vardys Rd - W													
10	L2	298	8.8	298	8.8	0.702	53.3	LOS D	18.0	135.2	0.97	0.84	31.4
11	T1	440	1.9	440	1.9	0.727	62.7	LOS E	14.8	105.2	1.00	0.86	29.9
12	R2	138	9.2	138	9.2	0.738	75.3	LOS F	9.7	73.2	1.00	0.86	17.8
Approach		876	5.4	876	5.4	0.738	61.5	LOS E	18.0	135.2	0.99	0.86	28.7
All Vehicles		5011	5.5	5011	5.5	0.854	41.6	LOS C	36.1	261.1	0.81	0.74	33.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	63.3	LOS F	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	32.3	LOS D	0.1	0.1	0.68	0.68
All Pedestrians		158	53.3	LOS E			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Tattersall Rd (PD-AM)

Network: Post Development AM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Tattersall Road
Post Development AM
Signals - Fixed Time   Coordinated   Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	196	13.4	196	13.4	0.583	11.1	LOS A	9.6	73.3	0.28	0.41	51.7
2	T1	900	10.2	900	10.2	0.583	3.6	LOS A	9.6	73.3	0.19	0.24	52.6
Approach		1096	10.8	1096	10.8	0.583	5.0	LOS A	9.6	73.3	0.21	0.27	52.3
North: Sunnyholt Road - N													
8	T1	1815	5.2	1815	5.2	0.676	0.8	LOS A	3.6	26.1	0.06	0.06	59.2
9	R2	120	12.3	120	12.3	0.445	22.6	LOS B	4.6	35.6	0.58	0.74	42.8
Approach		1935	5.6	1935	5.6	0.676	2.2	LOS A	4.6	35.6	0.10	0.10	57.8
West: Tattersal Road - W													
10	L2	58	41.8	58	41.8	0.564	60.4	LOS E	9.3	76.6	0.94	0.81	20.4
12	R2	225	7.5	225	7.5	0.564	58.3	LOS E	9.3	76.6	0.92	0.80	30.2
Approach		283	14.5	283	14.5	0.564	58.7	LOS E	9.3	76.6	0.93	0.80	28.6
All Vehicles		3314	8.1	3314	8.1	0.676	7.9	LOS A	9.6	76.6	0.20	0.22	51.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	8.2	LOS A	0.1	0.1	0.34	0.34
All Pedestrians		105	36.3	LOS D			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Vardys Rd (PD-AM)

Network: Post Development AM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Vardys Road
Post Development AM
Signals - Fixed Time   Coordinated   Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	99	13.8	99	13.8	0.852	60.9	LOS E	28.9	221.8	0.99	0.94	30.6
2	T1	749	11.4	749	11.4	0.852	56.0	LOS D	28.9	221.8	0.97	0.93	31.3
3	R2	93	25.0	93	25.0	0.618	83.7	LOS F	3.2	25.9	1.00	0.77	25.3
Approach		941	13.0	941	13.0	0.852	59.2	LOS E	28.9	221.8	0.98	0.91	30.5
East: Vardys Rd - E													
4	L2	138	6.9	138	6.9	0.363	51.5	LOS D	7.7	57.0	0.90	0.79	22.5
5	T1	355	6.5	355	6.5	0.553	57.8	LOS E	11.2	83.0	0.97	0.79	31.1
6	R2	193	6.0	193	6.0	0.688	77.7	LOS F	6.8	50.1	1.00	0.83	26.6
Approach		685	6.5	685	6.5	0.688	62.1	LOS E	11.2	83.0	0.96	0.80	28.4
North: Sunnyholt Road - N													
7	L2	467	3.8	467	3.8	0.498	17.7	LOS B	11.3	81.1	0.53	0.73	45.7
8	T1	1662	4.9	1662	4.9	0.967	50.4	LOS D	72.8	529.3	0.78	0.89	23.1
9	R2	145	20.3	145	20.3	0.157	45.8	LOS D	3.7	30.3	0.79	0.74	33.9
Approach		2275	5.6	2275	5.6	0.967	43.4	LOS D	72.8	529.3	0.73	0.85	28.4
West: Vardys Rd - W													
10	L2	218	14.5	218	14.5	0.283	27.9	LOS B	8.7	68.6	0.66	0.75	40.1
11	T1	645	5.4	645	5.4	1.002	111.0	LOS F	30.8	225.7	1.00	1.25	21.5
12	R2	122	15.5	122	15.5	0.929	94.5	LOS F	9.9	78.6	1.00	1.04	15.1
Approach		985	8.7	985	8.7	1.002	90.6	LOS F	30.8	225.7	0.92	1.11	23.4
All Vehicles		4886	7.8	4886	7.8	1.002	58.6	LOS E	72.8	529.3	0.85	0.91	27.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	61.4	LOS F	0.2	0.2	0.94	0.94
P2	East Full Crossing	53	33.4	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	52.4	LOS E	0.2	0.2	0.87	0.87
All Pedestrians		158	49.1	LOS E			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Tattersall Rd (PD-PM)

Network: Post Development PM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Tattersall Road
Post Development PM
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	299	5.3	299	5.3	0.769	13.6	LOS A	26.6	192.0	0.44	0.51	50.3
2	T1	1702	3.5	1702	3.5	0.769	6.1	LOS A	26.6	192.0	0.36	0.38	49.2
Approach		2001	3.7	2001	3.7	0.769	7.2	LOS A	26.6	192.0	0.38	0.40	49.5
North: Sunnyholt Road - N													
8	T1	1226	7.2	1226	7.2	0.476	3.4	LOS A	6.2	45.8	0.16	0.15	56.8
9	R2	54	17.6	54	17.6	0.616	42.5	LOS D	3.2	25.9	0.79	0.84	34.7
Approach		1280	7.6	1280	7.6	0.616	5.0	LOS A	6.2	45.8	0.19	0.18	55.3
West: Tattersal Road - W													
10	L2	108	23.3	108	23.3	0.749	65.4	LOS E	10.5	85.4	0.97	0.89	19.3
12	R2	217	8.7	217	8.7	0.749	57.6	LOS E	10.5	85.4	0.92	0.82	30.4
Approach		325	13.6	325	13.6	0.749	60.2	LOS E	10.5	85.4	0.94	0.84	27.2
All Vehicles		3606	6.0	3606	6.0	0.769	11.2	LOS A	26.6	192.0	0.36	0.36	47.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	61.4	LOS F	0.2	0.2	0.94	0.94
P4	West Full Crossing	53	9.3	LOS A	0.1	0.1	0.37	0.37
All Pedestrians		105	35.4	LOS D			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: Sunnyholt Rd / Vardys Rd (PD-PM)

Network: Post Development PM

14S1107000 Kings Park Metal Recycling Facility
Sunnyholt Road / Vardys Road
Post Development PM
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunnyholt Road - S													
1	L2	83	12.7	83	12.7	0.868	24.4	LOS B	35.8	261.1	0.76	0.73	44.4
2	T1	1557	4.3	1557	4.3	0.868	17.8	LOS B	35.8	261.1	0.71	0.68	46.4
3	R2	117	10.8	117	10.8	0.361	73.9	LOS F	3.7	27.1	0.98	0.75	27.2
Approach		1757	5.2	1757	5.2	0.868	21.9	LOS B	35.8	261.1	0.73	0.69	44.2
East: Vardys Rd - E													
4	L2	105	7.0	105	7.0	0.245	47.2	LOS D	5.5	41.1	0.85	0.76	23.8
5	T1	507	4.8	507	4.8	0.854	70.2	LOS E	18.6	135.3	1.00	0.97	28.2
6	R2	323	3.3	323	3.3	0.831	79.4	LOS F	11.8	85.2	1.00	0.93	26.3
Approach		936	4.5	936	4.5	0.854	70.8	LOS F	18.6	135.3	0.98	0.93	27.1
North: Sunnyholt Road - N													
7	L2	219	7.2	219	7.2	0.345	40.6	LOS C	9.3	67.4	0.69	0.76	35.4
8	T1	1016	7.7	1016	7.7	0.646	24.2	LOS B	23.9	177.3	0.65	0.58	34.0
9	R2	239	10.6	239	10.6	0.807	80.8	LOS F	8.8	66.9	1.00	0.90	25.7
Approach		1474	8.1	1474	8.1	0.807	35.8	LOS C	23.9	177.3	0.71	0.66	31.8
West: Vardys Rd - W													
10	L2	298	8.8	298	8.8	0.702	53.3	LOS D	18.0	135.2	0.97	0.84	31.4
11	T1	440	1.9	440	1.9	0.727	62.7	LOS E	14.8	105.2	1.00	0.86	29.9
12	R2	138	9.2	138	9.2	0.738	75.3	LOS F	9.7	73.2	1.00	0.86	17.8
Approach		876	5.4	876	5.4	0.738	61.5	LOS E	18.0	135.2	0.99	0.86	28.7
All Vehicles		5042	5.9	5042	5.9	0.868	41.9	LOS C	35.8	261.1	0.82	0.75	33.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	63.3	LOS F	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	32.3	LOS D	0.1	0.1	0.68	0.68
All Pedestrians		158	53.3	LOS E			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Annex D

REVISED AIR QUALITY ASSESSMENT AND BENCHMARKING STUDY

Waste Metal Recovery, Processing and Recycling Facility Expansion, Tattersall Road, Kings Park, Blacktown

Air Quality Assessment

For Sell and Parker

December 2014

0226308_AirQual_Rp02

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ERM

Waste Metal Recovery, Processing and Recycling Facility Expansion, Tattersall Road, Kings Park, Blacktown

Air Quality Assessment

Sell and Parker

December 2014

Approved by:	*Nathan Hegerty*
Position:	Project Manager
Signed:	
Date:	*19 December 2014*
Approved by:	*Murray Curtis*
Position:	Partner
Signed:	
Date:	*19 December 2014*

Environmental Resources Management Australia Pty Ltd Quality System

0226308_AirQual_rp01 DRAFT

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FINAL REPORT

Sell and Parker Pty Ltd

Waste Metal Recovery, Processing and Recycling Facility Expansion - 45 and 23-43 Tattersall Road, Kings Park, Blacktown

Air Quality Assessment

December 2014

Reference: 0226308_AirQual_Rp02

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1 INTRODUCTION

Sell and Parker Pty Ltd (Sell and Parker) currently operate a waste metal recovery, processing and recycling facility at 45 Tattersall Road, Kings Park, Blacktown (the "Site"). Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Sell and Parker to prepare an air quality assessment as part of the Environmental Impact Statement (EIS) to increase the capacity of the existing waste metal recovery, processing and recycling facility at 45 Tattersall Road (Lot 5 DP 7086), Kings Park, from the approved 90,000 tonnes per annum (tpa) to 350,000 tpa. The increase in the processing capacity of the waste metal recovery and processing business would result in the expansion of the facility to encompass the adjoining lot to the east (Lot 2 DP 550522 or 23-43 Tattersall Road). Both Lot 5 DP 7086 and Lot 2 DP 550522 are collectively referred to as 'the site' within this air quality assessment.

The main site at 45 Tattersall Road is currently used by Sell and Parker as a waste metal resource recovery, processing and recycling facility involving the shearing, fragmenting and shredding of industrial scrap metal, demolition material and car bodies. 23-43 Tattersall Road is currently occupied by 'Dexion', a manufacturing business, which intends to cease operations at this site and relocate offshore.

1.1 SITE ACTIVITIES

The operational process on site post-upgrade is required to be understood in detail when assessing impacts to air quality. In operations like metals recycling, there are many opportunities for particulates to be emitted including:

- truck delivery/removal of materials;
- truck dumping of materials onto stockpiles;
- material handling (pick up and drop off activities with front end loaders/mobile material handlers with grapples, conveyor drop points onto stockpiles etc.);
- conveying and conveyor transfer points;
- wet scrubber outlet vents of the hammer mill;
- manual metal cutting; and
- dust from wind erosion off the stockpiles.

A comprehensive understanding of the processes that occur on-site allows the development of a full emissions inventory and the selection of appropriate sources to be included in air dispersion modelling, with the proposed controls and mitigation measures taken into account. The following process description for the proposed handling capacity has informed the emissions inventory and mitigation measures applied. The mass of materials handled is considered to be the upper limit for each piece of equipment discussed.

1.1.1 Process Description

A simplified process diagram showing the proposed metal recycling process is provided in *Figure 2.2* of the main EIS document.

Petrol tanks will be emptied and liquefied petroleum gas (LPG) cylinders will be removed from cars before they are fed through the facility. LPG cylinders will be stored in a quarantined area before being removed offsite for decommissioning. Petrol and oil will be drained from tanks and collected in an above ground storage tanks and removed offsite for processing. Scrap metal that are too large in size to fit on a conveyor will be cut manually in the unloading zone.

Cars and scrap metal are lifted onto a heavy-duty feed conveyor (Cl) by an electric scrap handler. The operator of the mobile material handler will also check the feed material while loading it onto the conveyor. The materials will pass the control cabin, where an operator will also check incoming materials. The control cabin is an enclosed structure with sound proofing and air conditioning for operator comfort.

The feed conveyor transports raw material into the hammer mill which shreds the metal into fist-sized pieces.

The fragmented raw material is carried upwards by an incline conveyor and will then be dropped into a 'cascade' chute, hitting against its corners and therefore loosening any dirt and dust. Air from the cascade will be extracted by an induced draft fan and passed into the cascade cyclone, which will drop out particulates. Cleaned air will then pass through a wet scrubber to remove fine dust.

The cleaned fragmented material will then pass under drum magnets, which will pick up ferrous metals and drop them onto the picking conveyor (C2), where operators will remove remaining non-ferrous materials. The ferrous metals ·will continue up a conveyor (C3) which offloads the ferrous product into the product stockpile, that is contained in a designated area.

The non-ferrous materials will drop beneath the drum magnets to a conveyor which runs perpendicular to the ferrous product. This conveyor carries non-ferrous metals and wastes such as plastic and glass. The material is conveyed beneath another magnet, which picks up any small remaining quantities of ferrous metals and drops them into a skip for collection. Non-ferrous materials will continue through a pan feeder and trommel which will separate the materials into size streams for sorting.

The streams pass through an eddy-current separator, which collects aluminium, copper and brass into a skip. The streams then join and pass beneath a final eddy-current separator to win any remaining aluminium.

After passing through these stages, the remaining materials are waste products, which will be conveyed to an enclosed building. The new Post Shredder will involve a confidential proprietary arrangement of sizing, screening, eddy currents and induction sorters.

1.1.2 *Relevant Emissions*

Based on the process description in *Section 1.1.1*, the emissions relevant to the site activities are as follows:

- Total suspended particulates (TSP);
- Particulate matter with aerodynamic diameter of 10 µm or less (PM_{10});
- Dust deposition;
- Toxic air pollutants (metals);
- Nitrogen oxide (NO_x); and
- Odour.

2 *ENVIRONMENTAL SETTING*

This section provides a description of the environmental setting of the Site in the context of air quality and provides a description of:

- climate;
- existing ambient air quality; and
- additional sources of emissions.

2.1 *CLIMATE*

The Site is located in a temperate environment, with the local climate generally mild. *Table 2.1* provides an overview of the climatic extremes as recorded by the Bureau of Meteorology between the years 1965 - 2014. Overall, the local area is characterised by:

- annual average rainfall of 760.6 mm;
- average maximum daytime temperature of 29.8°C in January;
- average minimum daytime temperature of 5.9°C in July;
- average maximum humidity of 81% in March; and
- average minimum humidity of 42% in both August and September.

2.1.1 *Typical Wind Conditions*

Figure 2.1 provides wind roses showing the frequency of strength and direction of winds for the past five years (2008-2012 inclusive) at Horsley Park, NSW. The data has been divided to show seasonal and annual trends. The data shows that:

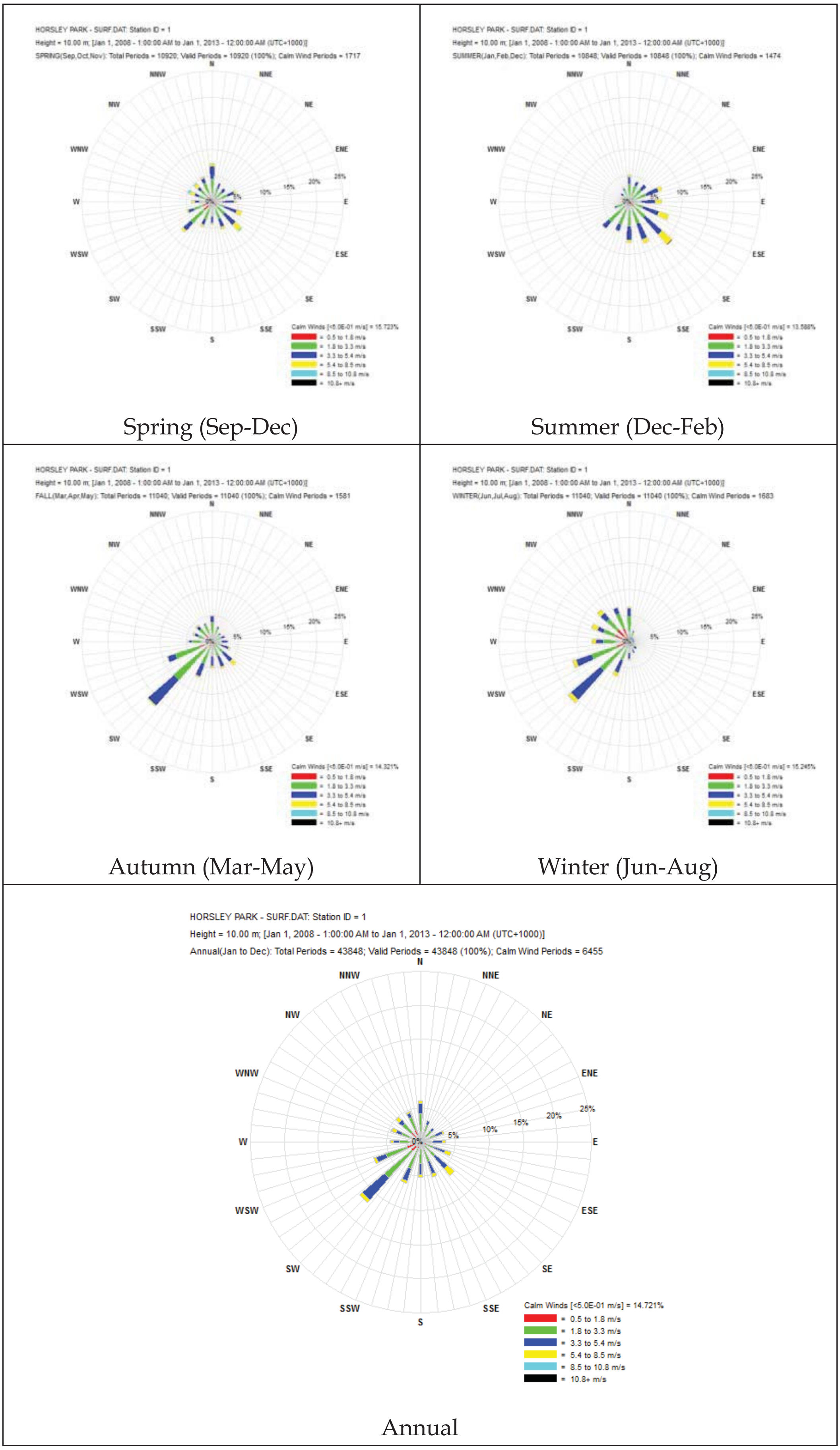
- Strong (5.4 – 8.5 m/s) south-easterly winds predominant in the summer and spring months;
- South-westerly winds predominant (15%) in autumn and winter; and
- Annually, south-west is the predominant wind direction however the strongest winds originate from the south-east.

Table 2.1 ***Mean climatic conditions for nearest Bureau of Meteorology observation station at Horsley Park, NSW***

Statistic Element	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Start Year	End Year
Mean maximum temperature (°C)	29.8	28.7	26.7	23.6	20.3	17.6	17.1	19	22.3	24.3	26.2	27.9	23.6	1997	2013
Mean minimum temperature (°C)	17.7	17.8	15.9	12.7	8.9	6.9	5.9	6.5	9.3	11.6	14.4	16.1	12	1997	2013
Mean rainfall (mm)	66.9	119.2	72.3	70.6	50.2	69.8	40.3	32.3	37.3	57.1	84.9	58.8	760.6	1997	2014
Mean number of clear days	12.6	11.7	11.7	8	9.5	8.3	6.6	6.3	7.1	9.2	10.6	10.5	112.1	1968	2001
Mean number of cloudy days	6.6	5	6.7	8.8	9	10	11.3	13.2	11.4	8.3	6.8	7.1	104.2	1968	2001
Mean daily evaporation (mm)	5.5	4.7	3.9	3	2	1.6	1.7	2.5	3.6	4.4	4.9	5.7	3.6	1965	2013
Mean 9am temperature (°C)	22	21.5	19.4	17.5	13.8	11.1	10.3	12	15.6	18.1	19.2	20.9	16.8	1997	2010
Mean 9am relative humidity (%)	73	77	81	76	77	80	78	70	65	61	70	71	73	1997	2010
Mean 9am cloud cover (oktas)	4.8	4.9	4.5	3.7	3.8	3.6	3.2	2.9	3.2	4	4.4	4.5	4	1965	2010
Mean 9am wind speed (km/h)	10.1	9.7	8.9	10.5	10.7	10.3	10.8	11.7	12.2	12.5	11.8	10.7	10.8	1997	2010
Mean 3pm temperature (° C)	28.2	27.1	25.3	22.2	19.2	16.6	16.1	17.8	20.8	22.5	24.2	26.5	22.2	1997	2010
Mean 3pm relative humidity (%)	49	53	54	53	52	55	50	42	42	45	50	48	49	1997	2010
Mean 3pm cloud cover (oktas)	4.8	5	4.8	4.2	4.3	4.2	3.9	3.8	3.9	4.4	4.8	4.6	4.4	1968	2001
Mean 3pm wind speed (km/h)	19.4	17	14.8	14.4	13	12.9	13.9	16.1	18.1	19.8	19.5	19.9	16.6	1997	2010

1. Mean cloudy days, mean clear days, mean daily evaporation, mean 9am cloud cover, and mean 3pm cloud cover have been taken from Prospect Reservoir [067019], 6.2 km away from Horsley Park.

Figure 2.1 Seasonal and annual wind roses for the past five years 2008-2012 at Horsley Park, NSW



2.1.2 *Atmospheric Stability*

Atmospheric stability is one of the key parameters that effects dispersion and dilution of emissions away from source. In essence it describes the degree of thermal and mechanical mixing of the atmosphere that occurs due to wind and thermal heating. Higher stability of the atmosphere typically results in poor dispersion conditions and higher ground level concentrations, whilst unstable atmospheres typically have the opposite impact.

Atmospheric stability is described by the Pasquil-Gifford classification where:

- Category A describes a very unstable atmosphere;
- Category B describes an unstable atmosphere;
- Category C describe a moderately unstable atmosphere;
- Category D describes a neutral atmosphere;
- Category E describes a stable atmosphere;
- Category F describes a very stable atmosphere; and
- Category G describes a very, very stable atmosphere.

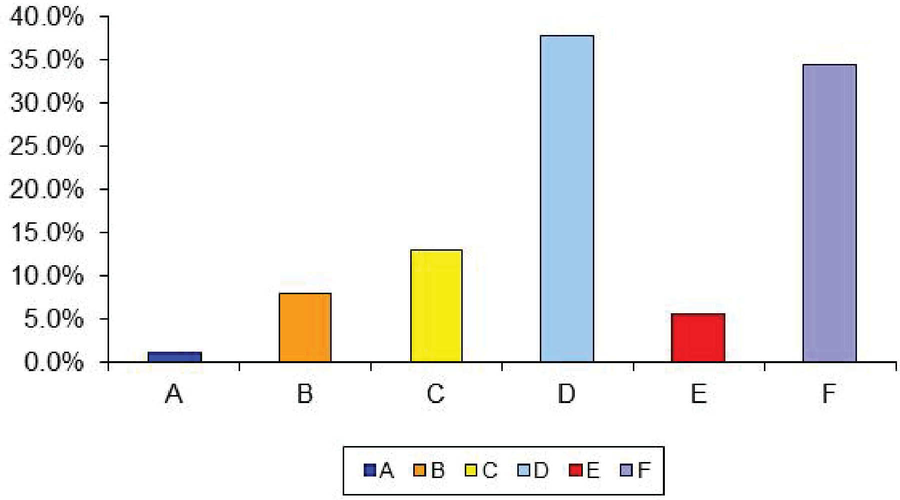
Usually, categories F and G are combined when describing the frequency of these categories.

Typically, these atmospheric conditions occur under the following conditions:

- Category A – very sunny and very windy conditions;
- Category B – Very sunny but less windy conditions;
- Category C – Moderately sunny and moderately windy conditions;
- Category D – Cloudy conditions; and
- Category E, F and G – Mostly clear or clear night time conditions with decreasing wind speed.

Figure 2.2 shows the predicted frequency of stability categories at the Site. Stability categories have been predicted using the methodology outlined in Section *4.3*.

Figure 2.2 Frequency of atmospheric stability categories predicted for the Site



The highest frequency of atmospheric stabilities for the 5 years of predicted meteorological data indicate that category D and F dominate the model domain. This reflects the prevalence of relative neutral day time conditions followed by clear and calm night time conditions.

2.2 EXISTING AMBIENT AIR QUALITY

Existing ambient air quality provides the basis on to which emissions from the project are projected. It is the cumulative concentration, resulting from existing air quality plus project contribution, which forms the prediction that is tested against the adopted assessment criteria.

2.2.1 PM_{10} Background

The nearest measurements of ambient air quality are undertaken by the Department of Environment and Heritage (DEH)[1] in William Lawson Park, Myrtle Street, Prospect, 5 km south to south-east of the Site. The maximum 24-hour average and the annual average per year for PM_{10} are presented in *Table 2.2*.

[1] Data downloaded from http://www.environment.nsw.gov.au/AQMS/search.htm

Table 2.2 ***Ambient Background Air Quality PM_{10} Concentrations***

Ambient Background Air Quality Concentration (µg/m³)	2008	2009	2010	2011	2012
Maximum 24-hour average	41.8	1680.3	40.1	41.5	38.7
Annual Average	17.8	25.9	15.4	15.8	17.2

2.2.2 *TSP Background*

Ambient air quality monitoring does not exist for TSP in the local environment, however it is commonly found in the ambient atmosphere. No measurements of existing ambient air quality exist for TSP within the surrounding area. This assessment has taken an average of the 5 years of annual average PM_{10} background concentrations of 18.4 µg/m³ and multiplied by two (2). It is commonly assumed that the particle size distribution ratio between PM_{10} and TSP is 0.5. This provides a typical annual average background concentration for TSP of 36.8 µg/m³.

2.2.3 *Nitrogen Dioxide (NO_2) Background*

The nearest measurements of NO_2 are undertaken at the Prospect monitoring site by the DEH, 5 km south to south-east of the Site. The maximum 1-hour average and annual average per year for NO_2 are presented in *Table 2.3*.

Table 2.3 ***Ambient Background Air Quality NO_2 Concentrations***

Ambient Background Air Quality Concentration (µg/m³)	2008	2009	2010	2011	2012
Maximum 1-hour average	-	95.9	80.8	73.3	94.0
Annual Average	-	20.7	22.6	18.8	18.8

2.2.4 *Ozone (O_3) Background*

Background levels of ozone (O_3) are needed to calculate the NO_2 conversion from NO_X, based on the O_3 limiting method. Levels of O_3 (O_3 is the oxidant which enables the oxidation of NO_X to NO_2) presents the upper limit of the NO_2 levels in the atmosphere once NO_X is emitted (see *Section 4.4.3* for the conversion methodology).

The nearest measurements of O_3 are undertaken at the Prospect monitoring site by the DEH, 5 km south to south-east of the Site. The maximum 1-hour average and annual average per year for O_3 is presented in *Table 2.3*.

Table 2.4 Ambient Background Air Quality O_3 Concentrations

Ambient Background Air Quality Concentration (μg/m³)	2008	2009	2010	2011	2012
Maximum 1-hour average	209.7	247.0	203.8	247.0	156.8
Annual Average	27.4	35.3	29.4	29.4	29.4

2.3 ADDITIONAL SOURCE OF EMISSIONS

Additional sources of emitted species within the modelled area include emissions from vehicular traffic and possible sources from other industry in the immediate vicinity of the site. These sources are implicitly included through the use of ambient monitoring to supply background air quality concentrations.

2.4 SENSITIVE RECEPTORS

Sensitive receptors are locations where the general population is likely to be exposed to the resultant ground level concentrations from the atmospheric emissions. The Approved Methods defines these as:

- "A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area" (Department of Environment and Conservation, 2005).

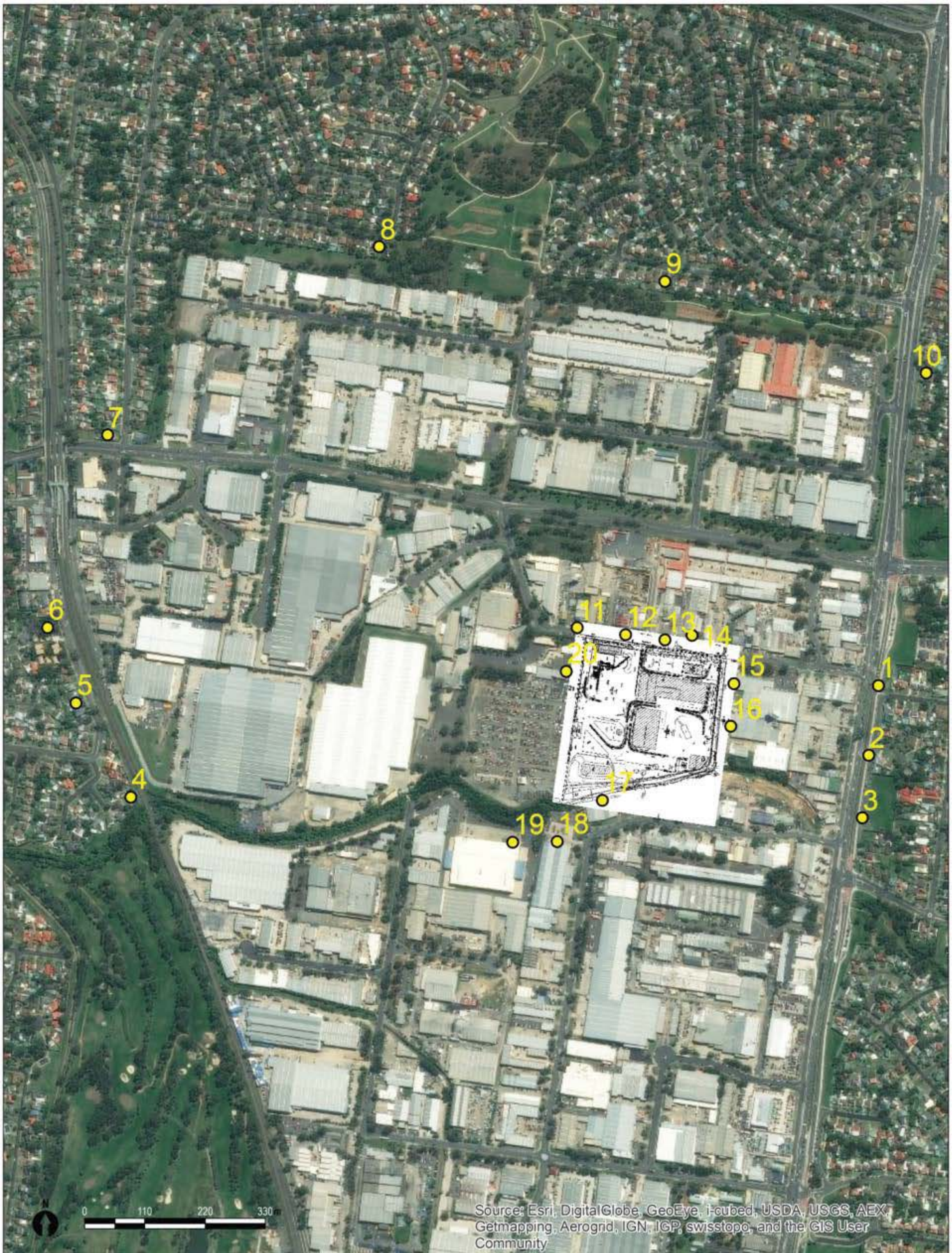
Ten (10) sensitive receptors (R1 – R10) in residential areas have been selected on the basis of proximity to Site. These sensitive receptors are intended to be representative of the general residential area. The modelled grid will provide assessment for all other residential addresses not specifically included in the dispersion model. In addition, ten (1) sensitive receptors in the industrial area (R11 – R20) immediately adjacent to the Site and beyond were included in the modelling. It is noted that since the locations of R11 – R20 have been selected to be immediately adjacent to the Site, the modelled results at R11- R20 will also provide the worst-case maximum offsite impacts.

The locations of sensitive receptors included in the model are provided in *Table 2.5* and *Figure 2.3*.

Table 2.5 Locations of Sensitive Receptors

Receptor #	Description	X-coordinate	Y-coordinate
R1	Residence	306993	6263656
R2	Residence	306975	6263528
R3	Residence	306963	6263414
R4	Residence	305627	6263452
R5	Residence	305527	6263624
R6	Residence	305475	6263762
R7	Residence	305584	6264114
R8	Residence	306081	6264458
R9	Residence	306603	6264395
R10	Residence	307080	6264227
R11	Industrial	306442	6263762
R12	Industrial	306531	6263749
R13	Industrial	306602	6263739
R14	Industrial	306653	6263748
R15	Industrial	306728	6263659
R16	Industrial	306723	6263581
R17	Industrial	306489	6263446
R18	Industrial	306406	6263371
R19	Industrial	306325	6263369
R20	Industrial	306423	6263682

Figure 2.3 Modelled sensitive receptor locations



Rev. N.	Date	Revision	Drawn by	Rev. by	Client: Sell and Parker	Modelled Sensitive Receptor Locations
0	26/02/14	Initial Issue	A. Radford	I. Cowan	Drawing No: Sensitive Receptor Locations.mxd	
1	16/12/14	Revised to add receptors	I. Cowan	S. Lo	Date: 16/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

ERM

3 LEGISLATIVE CONTEXT

This section defines the legislative context of the project in relation to air quality impacts, and discusses the adopted assessment criteria.

3.1 EMISSION CONCENTRATIONS

The *Protection of the Environment Operations (Clean Air) Regulation 2002* (the 'Regulation') provides the framework for the protection of the air environment in NSW and has been enacted under the *Protection of the Environment Operations Act 1997* (POEO Act). The Regulation:

- sets emission concentration standards and rate for certain activities;
- sets certain requirements in respect of domestic solid fuel heaters and motor vehicles; and
- establishes a framework for controlling where and what type of substances may be burnt.

Division 2 of the POEO Regulation states standards for scheduled premises and sets standards of concentrations for air impurities for stack or vent emissions. Schedule 4 provides a specific standard of concentration for TSP for any crushing, grinding, separating or materials handling activity of 20 mg/m^3 (Group 6). The emissions from the wet scrubber onsite must comply with this in-stack concentration of TSP. The manufacturer's guarantee is limited at 2 mg/m^3 of TSP from the wet scrubber vent and so the standard of concentration is met.

3.2 IMPACT ASSESSMENT CRITERIA

Part 4: Emission of Air Impurities from Activities and Plant in the Regulation refers to the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* ('Approved Methods') (Department of Environment and Conservation, 2005). The Approved Methods lists the statutory methods for modelling and assessing emissions of air pollutants from stationary sources in the state. Industry has an obligation to ensure compliance with the requirements specified in the Regulation.

The NSW EPA prescribes impact assessment criteria, which are outlined in the Approved Methods (Department of Environment and Conservation, 2005). The impact assessment criteria refer to the total pollutant load in the environment and impacts from new sources of these pollutants must be added to existing background levels for assessment of compliance. In accordance with the guidance document, ERM has adopted the assessment criteria shown in *Table 3.1* for particulate matter, nitrogen dioxide (NO_2) and individual toxic air pollutants (metals). It is noted that even though $PM_{2.5}$ are emitted from the Site activities, there are no assessment criteria for $PM_{2.5}$ under the Approved Methods; therefore, no individual impact assessment of $PM_{2.5}$ has been undertaken.

In addition to health impacts, airborne dust also has the potential to cause nuisance impacts by depositing on surfaces. *Table 3.1* also shows the maximum acceptable increase in dust deposition over the existing dust levels (2 g/m^2/month) and the maximum total deposited dust level (4 g/m^2/month). Given that there are no ambient dust deposition levels for the local area, this assessment will be compared to the maximum increase in deposited dust level. These criteria for dust deposition levels are set to protect against nuisance impacts.

Odour nuisance impact has been included in the impact assessment. The impact assessment criteria for complex mixtures of odours have been designed to take into account the range of sensitivity to odours within the community and to provide additional protection for individuals with a heightened response to odours. This is achieved by using a statistical approach, dependent upon population size.

The assessment criteria for particulate matter (TSP and PM_{10}), NO_2, dust deposition and lead were applied, in accordance with the requirements of the Approved Methods, as follows:

- at the nearest existing or likely future off-site sensitive receptor;
- the incremental impact (predicted impacts from the site alone) for each pollutant must be reported;
- background concentrations must be included; and
- total impact (incremental impact plus background) must be reported as the 100^{th} percentile and compared with the relevant impact assessment criteria.

The assessment criteria for individual toxic air pollutants (were applied, in accordance with the requirements of the Approved Methods, as follows:

- at and beyond the boundary of the facility;
- the incremental impact (predicted impacts from the site alone) for each pollutant must be reported in concentration units consistent with the criteria (mg/m^3 or ppm), for an averaging period of 1 hour and as the:
- 100th percentile of dispersion model predictions for Level 1 (screening-level dispersion modelling technique using worst-case input data) impact assessments; and
- 99.9th percentile of dispersion model predictions for Level 2 (refined dispersion modelling technique using site-specific input data) impact assessments.

The assessment criteria for complex mixtures of odorous air pollutants were applied, in accordance with the requirements of the Approved Methods, as follows:

- at the nearest existing or likely future off-site sensitive receptor;
- the incremental impact (predicted impacts from the site alone) must be reported in units consistent with the impact assessment criteria (odour unit (OU)), as peak concentrations (i.e. approximately 1 second average) in accordance with the requirements of Section 6 of the Approved Methods and as the:
- 100th percentile of dispersion model predictions for Level 1 impact assessments; and
- 99th percentile of dispersion model predictions for Level 2 impact assessments.

Table 3.1 Adopted Assessment Criteria

Species	Averaging Period	Criteria	Units
Particulate matter, NO_2 and lead			
TSP	Annual mean[1,4]	90	µg/m³
PM_{10}	Annual mean[2,4]	30	µg/m³
	24-hour maximum[3,4]	50	µg/m³
NO_2	1 hour[3,4]	246	µg/m³
	Annual mean[3,4]	62	µg/m³
Lead	Annual mean[3,4]	0.5	µg/m³
Individual toxic air pollutants			
Iron oxide fumes	1 hour[5]	0.09	mg/m³
Manganese and compounds	1 hour[5]	0.018	mg/m³
Copper dusts and mists	1 hour[5]	0.018	mg/m³
Chromium VI compounds	1 hour[5]	0.00009	mg/m³
Nickel and nickel compounds	1 hour[5]	0.00018	mg/m³
Dust deposition			
Maximum increase in deposited dust level	Annual[4]	2	g/m²/month
Maximum total deposited dust level	Annual[4]	4	g/m²/month

Odorous air pollutants (complex mixtures)[4,6]	
Population of affected community	**Impact assessment criteria for complex mixtures of odorous air pollutants (OU) (nose-response-time average, 99th percentile)**
Urban (≥~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

1. National Health and Medical Research Council (National Health and Medical Research Council, 1996)
2. Environment Protection Authority (NSW Environment Protection Authority, 1998)
3. National Environment Protection Council (National Environment Protection Council, 1998)
4. Department of Environment and Conservation (Department of Environment and Conservation, 2005)
5. State Environment Protection Policy (Air Quality Management) (Government of Victoria, 2001)
6. Environment Protection Authority ((NSW Environment Protection Authority, 2001)

4 METHODOLOGY

In order to determine the predicted ground level concentrations that result from the project, the following approach was adopted:

- dispersion model selection;
- emission estimation;
- meteorological modelling;
- dispersion modelling;
- post processing; and
- assessment.

4.1 DISPERSION MODEL SELECTION

Several different dispersion models are routinely used in Australia for the assessment of air quality impacts from industrial releases. These include:

- AERMOD;
- CALPUFF; and
- Ausplume.

Ausplume is the approved dispersion model for use in most simple, near field applications in NSW. The Approved Methods states, however that Ausplume version 6.0 or later as specifically not approved in the following applications:

- complex terrain, non-steady-state conditions;
- buoyant line plumes;
- coastal effects such as fumigation;
- high frequency of stable calm night-time conditions;
- high frequency of calm conditions; and / or
- inversion break-up fumigation conditions (Department of Environment and Conservation, 2005).

Consideration of *Figure 2.1* and *Figure 2.2* show that over the five years of data:

- calm winds (< 0.5 m/sec) occur for approximately 14% of the time; and
- stable night time conditions occur for approximately 35% of all hours.

Consequently, as determined by the Approved Methods, the CALPUFF model has been used for this assessment.

CALPUFF was selected as a multi-layer, multi-species non-steady state puff dispersion model that can simulate the effects of time- and space-varying meteorological conditions on pollutant transport, transformation and removal (Scire, et al., 2000).

CALPUFF is a highly versatile and widely-used model which can be run in three-dimensional or two-dimensional mode with respect to meteorology. The three-dimensional mode allows spatially varying wind fields, for example, to be incorporated: this can be important in coastal regions with seabreeze effects. CALPUFF also allows plumes to be tracked through time as they are transported by regional winds: in coastal regions recirculation of pollutants due to seabreeze and landbreeze cycles can also be important.

CALPUFF contains algorithms for near-source effects such as building downwash, partial plume penetration, sub-grid scale interactions as well as effects such as pollutant removal, chemical transformation, vertical wind shear, a Probability Distribution Function for dispersion in the convective boundary layer and coastal interaction effects (e.g. sea-breeze recirculation and fumigation within the Thermal Internal Boundary Layer).

Meteorological data used to drive CALPUFF are processed by the CALMET meteorological pre-processor (Scire, et al., 2000). CALMET includes a wind field generator containing objective analysis and parameterised treatments of slope flows, terrain effects and terrain blocking effects. The pre-processor produces fields of wind components, air temperature, relative humidity, mixing height and other micro-meteorological variables to produce the three-dimensional meteorological fields that are used in CALPUFF. CALMET uses measured and/or modelled meteorological inputs in combination with land use and geophysical information for the modelling domain to predict gridded meteorological fields for the region of interest.

CALPUFF is a United States Environmental Protection Agency (USEPA) regulatory model and is widely used in Australia.

4.2 *EMISSION ESTIMATION*

Estimates of emissions provide the basis for atmospheric dispersion modelling. Consideration of the processes on site has concluded that the dominant species to be emitted are:

- TSP;
- PM_{10}; and
- Dust deposition.

Emissions of the following species will occur to a lesser extent:

- Toxic air pollutants (metals);
- Nitrogen dioxide (NO_2); and
- Odour.

The only combustion processes that occur on site are from vehicle engines, with the conveyors, hammermill, sheer and shredder powered by mains electricity. As discussed previously, the change in vehicle movement is expected to be less than 5%, and the change in emissions as a result of vehicle use is not considered to be a significant contribution to overall site emissions. The assessment has therefore concentrated on emissions of species described above from the handling and processing that occurs on site.

Table 4.1 shows the sources identified from the understanding of the process together with the source name used within the modelling. *Table 4.2* and *Table 4.3* include a summary of pollutant emission rates included in the dispersion modelling for volume and point sources, respectively. The pollutant emission rates take into account the water suppression as a mitigation action, achieving 70% reduction in emissions (Department of Sustainability, Environment, Water, Population and Communities, 2012). The water suppression is committed to be undertaken by site management for the following emission sources:

- Materials handling (MH01 – MH11); and
- Truck dumping (TRKD01 – TRKD02).

The sources C1 and C2 are considered fugitive emission sources; for sensitivity analysis, C1 and C2 have been modelled as volume and point sources to determine the more appropriate modelling configuration to represent these fugitive sources (see *Annex D*).

The sources TP01 – TP08, CV01 – CV33, TRKD01 - TRKD02, C1 – C2, WE01-WE06 and WSS01 are discussed in detail in *Annex A*. TP01 – TP08, CV01 – CV33, TRKD01 - TRKD02, WE01 – WE06 and WSS01 have variable TSP/PM_{10} emission rates dependent on wind speed, rainfall, or temperature, or a combination thereof, and are discussed further in *Annex A*.

Table 4.1 Source identification and process description

Source Name	Process Description
MH01	Non-ferrous material is transferred to the non-ferrous processing building
MH02 MH03	Transfer of raw material directly to the inspected stockpile of scrap metal (bypass pre-shredder)
MH04 MH05	Transfer of raw material from stockpile to pre-shredder
MH06 MH07	Transfer of pre-shredder output to a truck to convey to the inspected stockpile of scrap metal close to the conveyor into the hammer mill
MH08 MH09	Transfer of the inspected stockpile of scrap metal close to the conveyor onto the hammer mill conveyor
MH10 MH11	Ferrous metals are collected from the stockpile by front end loader and loaded into trucks.
TP01	Pre-shredder drop point
TP02	The cleaned fragmented material (on a conveyor C1) passes under a drum magnet, where ferrous metals are dropped onto the picking conveyor (C2)
TP03	Ferrous metals transferred from C2, where operators remove remaining non-ferrous materials, to C3.
TP04	Ferrous metals are conveyed onto the product stockpile.
TP05	Non-ferrous materials drop beneath the drum magnet to a conveyor (C4) that runs perpendicular to the ferrous product.
TP06	Transfer point at conveyor bend 1
TP07	Transfer point at conveyor bend 2
TP08	Transfer point at conveyor bend 3
CV01 - CV03	Wind erosion from exposed conveyor (material from the stockpiles is conveyed into the hammer mill)
CV04	Wind erosion from exposed conveyor (material from hammer mill is carried upwards by an incline conveyor and dropped into chute)
CV05	Wind erosion from exposed conveyor (the cleaned fragmented material from the cascade chute passes under the drum magnet and ferrous metals are removed)
CV06 - CV07	Wind erosion from exposed conveyor (operators remove remaining non-ferrous materials)
CV08 - CV09	Wind erosion from exposed conveyor (ferrous materials are taken and dropped onto a conveyor, which are conveyed to the product stockpile)
CV10 - CV11	Wind erosion from exposed conveyor (non-ferrous materials are dropped onto a conveyor, which transports material to the conveyor before the non-ferrous processing building)

Source Name	Process Description
CV12	Wind erosion from exposed conveyor (conveys non-ferrous material into the non-ferrous recovery plant)
CV13 - CV15	Wind erosion from exposed conveyor (floc product is transferred onto conveyor)
CV16 - CV33	Wind erosion from exposed conveyor (conveyor transports floc product to the post shredder processing building. Conveyor is enclosed)
TRKD01	Truck dumping at raw material delivery
TRKD02	Truck carries pre-shredder output to the inspected stockpile of scrap metal close to the conveyor into the hammer mill
C1	Metals cutting at scrap unloading area
C2	Metals cutting at scrap unloading area
WE01	Wind erosion (scrap stockpile)
WE02	Wind erosion (scrap stockpile)
WE03	Wind erosion (post pre-shredder stockpile 1 - at pre-shredder)
WE04	Wind erosion (post pre-shredder stockpile 2 - at hammer mill)
WE05	Wind erosion (ferrous product stockpile)
WE06	Wind erosion (ferrous product stockpile)
WSS01	Wet scrubber stack (hammermill)

1. Emission rates for sources TP01 – TP08, CV01 – CV33, TRKD01 - TRKD02, C1 – C2, WE01-WE06 and WSS01 are discussed in detail in *Annex A*.

Table 4.2 Mass emission rates by volume source

Source Name[1]	Source Type	Throughput (tonnes/day)	Operation[2] (hours/day)	Units	Species TSP	PM$_{10}$
MH01	Volume	50	15	g/sec	0.0014	0.0006
MH02	Volume	750	14	g/sec	0.022	0.0089
MH03	Volume	750	14	g/sec	0.022	0.0089
MH04	Volume	300	14	g/sec	0.0089	0.0036
MH05	Volume	300	14	g/sec	0.0089	0.0036
MH06	Volume	300	14	g/sec	0.0089	0.0036
MH07	Volume	300	14	g/sec	0.0089	0.0036
MH08	Volume	1050	14	g/sec	0.031	0.013
MH09	Volume	1050	14	g/sec	0.031	0.013
MH10	Volume	790	14	g/sec	0.024	0.0094
MH11	Volume	790	14	g/sec	0.024	0.0094
TP01	Volume	300	14	g/sec	See Annex A	
TP02	Volume	790	14	g/sec	See Annex A	
TP03	Volume	790	14	g/sec	See Annex A	
TP04	Volume	790	14	g/sec	See Annex A	
TP05	Volume	40	14	g/sec	See Annex A	
TP06	Volume	240	14	g/sec	See Annex A	
TP07	Volume	240	14	g/sec	See Annex A	
TP08	Volume	240	14	g/sec	See Annex A	
CV01 - CV04	Volume	1050	14	g/sec	See Annex A	

Source Name[1]	Source Type	Throughput (tonnes/day)	Operation[2] (hours/day)	Units	Species TSP	Species PM_{10}
CV05 - CV09	Volume	790	14	g/sec	See Annex A	
CV10 - CV12	Volume	40	14	g/sec	See Annex A	
CV13 - CV15	Volume	220	14	g/sec	See Annex A	
CV16 - CV33	Volume	240	14	g/sec	See Annex A	
TRKD01 – TRKD02	Volume	1500	15	g/sec	See Annex A	
C1 - C2[3]	Volume	-	10	g/sec	See Annex A	
WE01 – WE06	Volume	-	24	g/sec	See Annex A	
WSS01	Volume	-	14	g/sec	See Annex A	

1. Sources TP01 – TP08, CV01 – CV33, TRKD01 - TRKD02, C1 – C2, WE01-WE06 and WSS01 are discussed in detail in *Annex A*. These sources have variable emission rates dependent on wind speed, rainfall, or a combination thereof.
2. Sources have been modelled as occurring between the hours of 6am-9pm (15 hours/day), 6am-8pm (14 hours/day), or 7am – 5 pm (10 hours/day).
3. C1 – C2 are modelled as both volume and point sources for sensitivity testing to assess the more appropriate modelling configuration to represent these fugitive sources. Modelling results will only be taken from the more appropriate modelling configuration. See *Annex D* for further details.

Table 4.3 Mass emission rates by point source (C1 and C2) for NO_X, odour and toxic air pollutants

Source Name[1]	Source Type	Operation[2] (hours/day)	Species: Odour (OU/s)	Species: NO_X (g/s)	Species: Iron oxide fumes (g/s)	Species: Manganese and compounds (g/s)	Species: Copper dusts and mists (g/s)
C1[3]	Point	10	0.018	0.33	1.15	0.12	0.016
C2[3]	Point	10	0.018	0.33	1.15	0.12	0.016

1. Sources C1 – C2 are discussed in detail in *Annex A*.
2. Metals cutting take place from 7am to 5 pm (10 hours/day).
3. C1 – C2 are modelled as both volume and point sources for sensitivity testing to assess the more appropriate modelling configuration to represent these fugitive sources. Modelling results will only be taken from the more appropriate modelling configuration. See *Annex D* for further details.

Annex A provides a description of the methodology used to derive the emission estimates for each of the sources listed, together with the input data used in the emission estimation.

The proposed expansion is likely to result in a decrease in emissions of particulate matter from the site whilst increasing in the throughput from the approved 90,000 tonnes/annum to 350,000 tonnes/annum. This reduction will be achieved through effective dust control measures and operational efficiencies.

Efficiencies and mitigation measures proposed for the expansion that reduce the level of particulate matter emitted on site include:

- The site will be totally sealed. A sealed surface provides a paved road for truck movement on and off site. This eliminates a large source of particulate matter emissions compared to an unpaved road (Department of Sustainability, Environment, Water, Population and Communities, 2012). Unpaved roads emit particulate matter as the force of the wheels on the road surface pulverise the surface material into fine particles. These fine particles are lifted by and dropped from the rolling wheels of vehicles and are removed by traffic through re-entrainment into the atmosphere. The road surface is also exposed to strong air currents in turbulent shear with the surface. The turbulent wake that is left behind the vehicle continues to act on the road surface after the vehicle has passed, resulting in further emissions of particulate matter. Therefore, paving the road surface reduces the emission of particulate matter on site significantly, assuming the silt loading on the surface of the road is maintained at an acceptable level.

- A sealed surface also reduces the emission of particulate matter from the mobile materials handling equipment due to a more consistent driving surface and the ability to select more direct routes across the site.

- The new site design no longer requires trucks to enter the site twice but allows for one main entrance and exit point, reducing the kilometres travelled by trucks. This reduces the emissions of particulate matter from the exhaust and reduces any potential emissions from wheel generated dust. Emissions from vehicle exhaust are not considered significant unless a change in net annual average daily traffic (AADT) or peak traffic flows are greater than ±5% or ±10% (Environmental Protection UK, 2010). The proposed expansion will not result in a change in traffic conditions of more than 5% net across the expanded site (accounting for existing Dexion operations) and hence vehicle emissions have not been considered in this assessment.

- Additional equipment purchased for the upgrade will conform to the standards of the latest technology.

4.3 METEOROLOGICAL MODELLING

In dispersion modelling, meteorology drives dispersion and dilution of emissions and therefore determines the predicted concentrations at ground level. It is important, therefore, that meteorology used in the dispersion modelling provides a reasonable representation of Site meteorology.

In order to provide the dispersion model with appropriate meteorological information, the following approach was taken:

- Meteorological model selection;

- Year selection;
- Meteorological model setup; and
- Meteorological model validation.

4.3.1 *Meteorological Model Selection*

Meteorological modelling conducted for this assessment included The Air Pollution Model (TAPM) and CALMET (a three dimensional micro-meteorological model). Insufficient site specific meteorological data was available for the site to adequately describe the local wind flows given the complex nature of the terrain in the model domain. TAPM was selected as an industry standard method able to create a 3-dimensional data file of gridded meteorological parameters by predicting airflow important to local scale air pollution from large scale meteorology provided by synoptic analyses. The TAPM outputs can be converted to file compatible with CALMET using CALTAPM and used as an initial estimated wind field in CALMET.

CALMET is the meteorological pre-processor for the chosen dispersion model and considers the initial estimated wind fields together with any observational data from further afield, terrain and land use information to produce a three-dimensional micro-meteorological model for use in dispersion modelling.

4.3.2 *Year Selection*

The most recent five years with available meteorological data at the time of preparing the assessment (2008-2012) were selected as the meteorological model years in accordance with international standard practice for dispersion modelling.

4.3.3 *Meteorological Model Setup*

Meteorological modelling was conducted in accordance with the *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia'* (Barclay & Scire, 2011). The following sub-sections detail the adopted methodology.

TAPM

Meteorological data was prepared for the dispersion modelling using TAPM developed by CSIRO. TAPM v4 solves the fundamental fluid dynamics and scalar transport equations to predict meteorology and (optionally) pollutant concentrations. It consists of coupled prognostic meteorological and air pollution concentration components. The model predicts airflow important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of larger scale meteorology provided by synoptic analyses. The Technical Paper by Hurley (2008a) describes technical details of the model equations, parameterisations, and numerical methods. A summary of some verification studies using TAPM is also given in Hurley (2008b).

A meteorological dataset for 2008-2012 was created using meteorological information and terrain data inherent to TAPM. TAPM v4 has a tendency to over-predict the incidence of light winds in some situations. However, this tendency is considered to lend a conservative bias as low wind speeds are conducive to higher ground level concentrations.

TAPM was configured with the following information:

- centre grid point: 306580mE, 6263617mN (UTM Grid Zone 56S);
- grid points NX x NY x NZ = 35 x 35 x 25;
- 4 grid resolutions (nests) were defined: 30,000, 10,000, 3,000, 1,000; and
- 4 spin up days were allocated and meteorology was output after 2 days.

CALTAPM

CALTAPM was developed to provide users of the TAPM model the ability to create an hourly, 3-dimensional data file of gridded meteorological parameters of the type 3D.DAT for direct use in the CALMET diagnostic meteorological model. When used this way the TAPM data can be used in CALMET to determine the initial guess wind field, prior to the weighting of true observations or even to run CALMET in no-observation mode. The TAPM output file was converted to a 3D.DAT file using CALTAPM for input into CALMET as an initial guess wind field.

CALMET

CALMET is a meteorological pre-processor that includes a wind field generator containing objective analysis and parameterised treatments of slope flows, terrain effects and terrain blocking effects. The pre-processor produces fields of wind components, air temperature, relative humidity, mixing height and other micro-meteorological variables to produce the three-dimensional meteorological fields that are used in the CALPUFF dispersion model.

CALMET requires several datasets in order to resolve the surface and upper air meteorology occurring for each hour of the year:

- surface observations
- wind speed
- temperature
- cloud cover amount
- precipitation amount and type

- base cloud height
- upper air observations
- height of observation
- wind speed and direction at each height
- temperature at each height
- barometric pressure at each height
- land use data
- topographical data

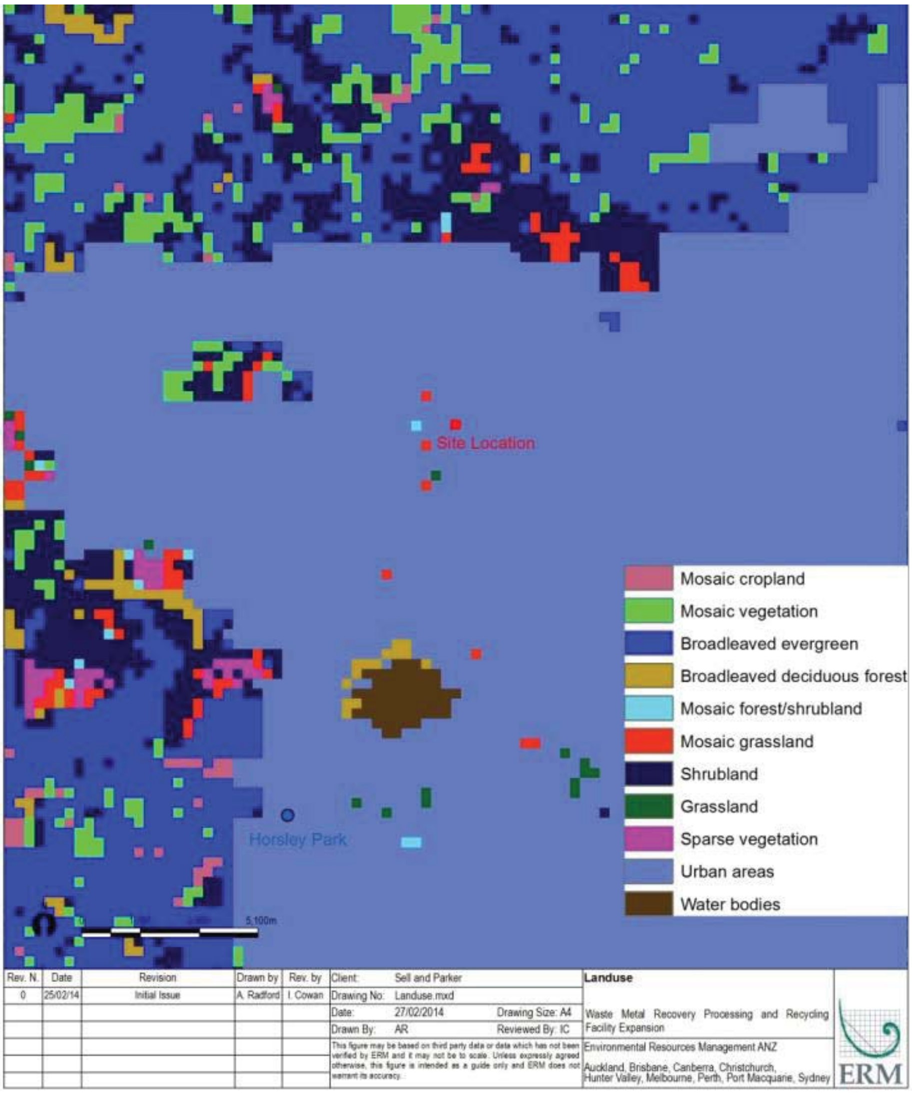
Surface observation data in the surrounding area was available from a Bureau of Meteorology (BoM) meteorological station at Horsley Park, NSW. A precipitation file was also generated from observations at Horsley Park. CALTAPM provided a 3D.DAT file containing surface and upper air observations at every grid point in the model domain. CALMET was run with a grid resolution of 0.2 km covering a 24 km by 24 km model domain. The vertical resolution incorporated 12 cell face heights up to 2000 m. The grid origin was located at 294580 mE, 6251617mN (UTM Zone 56S).

Land Use

The land use for the Project area was obtained from European Space Agency (ESA) GlobCover Portal. ESA delivers global composites and land cover maps using as input observations from the 300 m MERIS sensor on board the ENVISAT satellite mission. The land use maps were generated from observations taken during January - December 2009.

The model domain is mainly characterised by the urban land use category given the location in the north-western suburbs of Sydney.

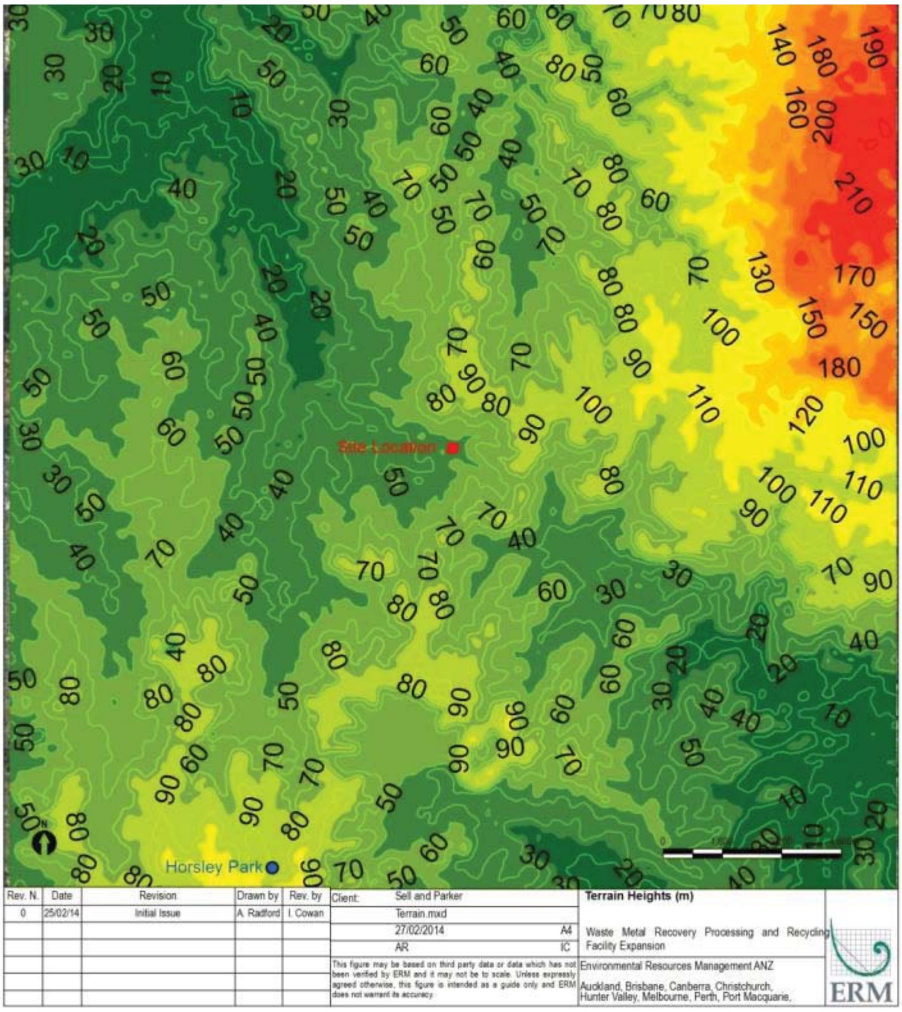
Figure 4.1 Landuse used in the meteorological modelling



Terrain

The terrain for the Project area was obtained from the NASA SRTM Mission at a 90 m spatial resolution. The terrain close to the site is quite uniform with a change in height of less than 40 m within 5 km of the site. The landscape could be described as gentle rolling hills with some larger terrain features to the north-east of the site. Horsley Park in the south-west of the modelling domain is likely to experience significantly different local wind flows than that at the site. Horsley Park is an elevated location is dominated by wind flows from the south-west. Given the undulating hills surrounding the site, wind directions are likely to channel through the valleys to the west-south-west. Both sites will be influenced on a local scale by drainage flows characterised by mountain-valley interactions.

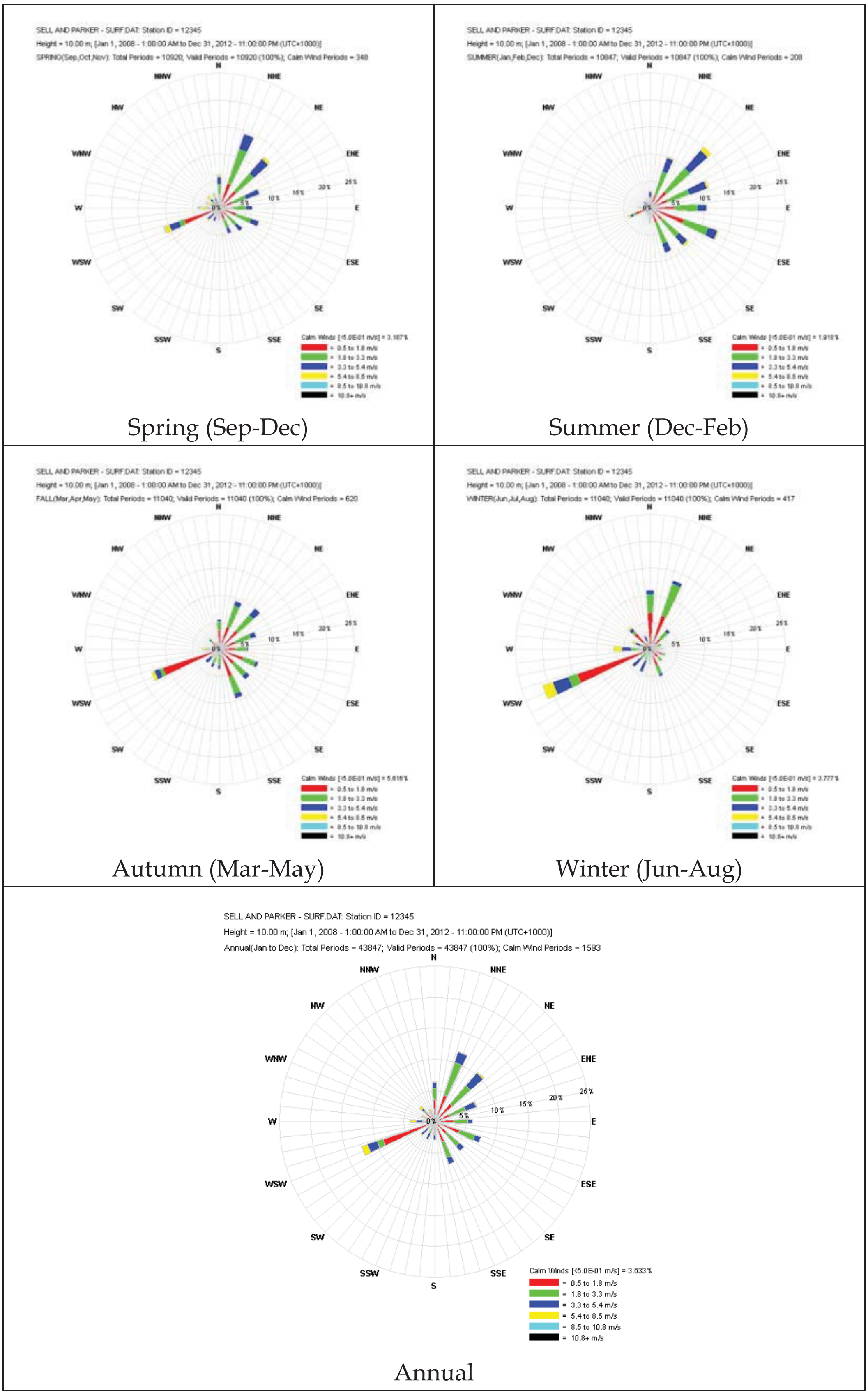
Figure 4.2 Terrain used in the meteorological modelling



4.3.4 Meteorological Model Validation

Figure 4.3 shows the wind roses predicted for the Site by CALMET including the data from TAPM and observation location at Horsley Park as described above.

Figure 4.3 Predicted wind roses for the site



Comparison of *Figure 4.3* with *Figure 2.1* indicates similarities between the datasets with almost no wind flow from the west or north-west. Comparison of the wind roses predicted for the site (*Figure 4.3*) with the local terrain (*Figure 4.2*) shows that the wind flows for both sites are likely to align with their local shallow valley system. It is considered that the decrease in calm conditions at the Site compared to Horsely Park is reflective of local drainage in a shallow valley system at the Site compared to the position of the BoM monitor at the base of a hill at Horsely Park. The calm conditions demonstrated at Horsely Park are likely to be reflected in the higher frequency of 0.5 m/sec to 1.0 m/sec winds predicted at the Site as a result of cool air drainage.

4.4 *DISPERSION MODELLING*

Dispersion modelling was undertaken using the CALPUFF dispersion model. The emission sources were configured in the dispersion model using the parameters shown in *Table 4.4* together with the rates shown in *Table 4.2* and *Table 4.3*.

Table 4.4 Emission parameters used in dispersion model

Source Name[1]	Source Type	Diameter (m)	Release velocity (m/sec)	Release Height (m)	σy (m)	σz (m)
WSS01	Volume	-	-	10	0.47	4.65
TRKD01	Volume	-	-	2.5	1.16	2.33
TRKD02	Volume	-	-	2.5	1.16	2.33
MH01	Volume	-	-	4	1.02	0.37
MH02	Volume	-	-	3.5	1.02	2.16
MH03	Volume	-	-	4	1.02	0.37
MH04	Volume	-	-	3.5	1.02	2.16
MH05	Volume	-	-	4	1.02	0.37
MH06	Volume	-	-	2	1.02	2.16
MH07	Volume	-	-	4	1.02	0.37
MH08	Volume	-	-	2	1.02	2.16
MH09	Volume	-	-	2	1.02	0.37
MH10	Volume	-	-	3.5	0.84	2.21
MH11	Volume	-	-	4	0.84	0.37
TP01	Volume	-	-	7	0.47	0.23
TP02	Volume	-	-	1.0	0.47	0.09
TP03	Volume	-	-	1.0	0.47	0.09
TP04	Volume	-	-	7.0	0.47	0.23
TP05	Volume	-	-	1.0	0.47	0.09
TP06	Volume	-	-	3	0.70	0.09
TP07	Volume	-	-	3	0.70	0.09
TP08	Volume	-	-	3	0.70	0.09
CV01	Volume	-	-	2	1.40	0.47
CV02	Volume	-	-	2	1.40	0.47
CV03	Volume	-	-	2	1.40	0.47

Source Name[1]	Source Type	Diameter (m)	Release velocity (m/sec)	Release Height (m)	σy (m)	σz (m)
CV04	Volume	-	-	3.5	0.47	0.81
CV05	Volume	-	-	1	0.47	0.23
CV06	Volume	-	-	1	0.47	0.23
CV07	Volume	-	-	1	0.47	0.23
CV08	Volume	-	-	3.5	0.47	0.81
CV09	Volume	-	-	3.5	0.47	0.81
CV10	Volume	-	-	1	0.47	0.23
CV11	Volume	-	-	1	0.47	0.23
CV12	Volume	-	-	1	0.47	0.23
CV13	Volume	-	-	3	0.70	0.70
CV14	Volume	-	-	3	0.70	0.70
CV15	Volume	-	-	3	0.70	0.70
CV16	Volume	-	-	3	0.70	0.70
CV17	Volume	-	-	3	0.70	0.70
CV18	Volume	-	-	3	0.70	0.70
CV19	Volume	-	-	3	0.70	0.70
CV20	Volume	-	-	3	0.70	0.70
CV21	Volume	-	-	3	0.70	0.70
CV22	Volume	-	-	3	0.70	0.70
CV23	Volume	-	-	3	0.70	0.70
CV24	Volume	-	-	3	0.70	0.70
CV25	Volume	-	-	3	0.70	0.70
CV26	Volume	-	-	3	0.70	0.70
CV27	Volume	-	-	3	0.70	0.70
CV28	Volume	-	-	3	0.70	0.70
CV29	Volume	-	-	3	0.70	0.70
CV30	Volume	-	-	3	0.70	0.70
CV31	Volume	-	-	5	0.70	1.16
CV32	Volume	-	-	5	0.70	1.16
CV33	Volume	-	-	5	0.70	1.16
WE01	Volume	-	-	3.5	2.33	3.26
WE02	Volume	-	-	3.5	2.33	3.26
WE03	Volume	-	-	3.5	1.16	3.26
WE04	Volume	-	-	3.5	2.33	3.26
WE05	Volume	-	-	3.5	2.33	3.26
WE06	Volume	-	-	3.5	2.33	3.26
C1[3]	Volume	-	-	0.75	0.23	0.70
C2[3]	Volume	-	-	0.75	0.23	0.70
C1[3]	Point	0.05	0.01	1	-	-
C2[3]	Point	0.05	0.01	1	-	-

1. The release temperature for all sources (aside from C1 – C2 as point sources, see *Annex A*) is ambient air temperature.
2. C1 – C2 are modelled as both volume and point sources for sensitivity testing to assess the more appropriate modelling configuration to represent these fugitive sources. Modelling results will only be taken from the more appropriate modelling configuration.

The locations of the sources, described by the source names in Table 4.4, are indicated in Figure 4.4.

Figure 4.4 Location of the point and volume sources modelled

4.4.1 *Time Varying Emission Rates*

Time varying emission rates have been used for some emission sources which do not emit on a constant temporal basis and/or do not emit at a constant rate. The wet scrubber, will operate between the hours of 6 am to 8 pm and has been modelled only for these hours. The emission rate from the wet scrubber has also been correlated to the ambient temperature (*Annex A*). The metal cutting operations typically take place up to 10 hours in a day (assumed from 7 am to 5 pm).

The materials handling activities on site, which have been represented as volume sources, have also been modelled between the hours of 6 am to 8 pm. Truck dumping, associated with the transportation of raw materials on the proposed site, has been modelled between the site operation hours of 6 am to 9 pm. The emission rates associated with proposed truck dumping and wind erosion from stockpiles have utilised equations relating wind speed and rainfall to the estimate the emissions of dust from these activities (*Annex A*).

4.4.2 *Receptor Grid*

A receptor grid of dimension 12 km by 12 km with a south west corner at 300580 mE, 6257617 mN (UTM Grid Zone 56) at a resolution of 200m was used to model predicted concentrations at ground level. The height of each receptor within the grid was extracted from the SRTM data.

4.4.3 *NO_X-to-NO_2 Conversion*

On emission to atmosphere nitrogen species are emitted in two main forms:

- Nitric oxide (NO); and
- Nitrogen dioxide (NO_2).

Together these oxidation states of nitrogen species are termed oxides of nitrogen or NO_X.

Atmospheric chemistry results in the oxidation of NO to form NO_2, whilst photodisassociation of NO_2 results in the formation of NO and an oxygen radical.

Consequently, not all emitted NO_X forms NO_2, and the formation of NO_2 is limited by the amount of oxidant in the atmosphere. One of the most prevalent oxidants that converts NO to NO_2 is tropospheric ozone (O_3). The formation of NO_2 can therefore be considered to be limited by the amount of ozone available for feed the reaction.

The ozone limiting method (OLM) presented in the Approved Methods, allows for the consideration of oxidation of NO to form NO_2 within the assessment using *Equation 4.1*.

Equation 4.1 Calculation of NO_2 through the ozone limiting method

$$[NO_2]_{total} = \{0.1 \times [NO_X]_{pred}\} + MIN\{(0.9) \times [NO_X]_{pred} \ or \ (46/48) \times [O_3]_{bkgd}\} + [NO_2]_{bkgd}$$

Where:

$[NO_2]_{total}$ is the predicted concentration of NO_2 in µg/m^3 including background

$[NO_X]_{pred}$ is the dispersion model prediction of the ground level NO_X in µg/m^3

MIN is the minimum of the two quantities in the braces

$[O_3]_{bkgd}$ is the background ambient O_3 concentration in µg/m^3

(46/48) is the molecular weight of NO_2 divided by the molecular weight of O_3 in µg/m^3

$[NO_2\}_{bkgd}$ is the background ambient $_{NO2}$ concentration in µg/m^3.

Equation 4.1 has been used in this assessment using background data from the EPA prospect monitoring station.

4.5 POST-PROCESSING

Post processing has been undertaken using CALPOST for each of the five years modelled. This process reviews each of the hourly predicted concentrations across the model grid and at the sensitive receptors, averages the concentrations according to the requirements of the assessment criteria and retrieves the maximum predicted concentration at each location for the requisite averaging period specified by the Impact Assessment Criteria (*Table 3.1*).

5 RESULTS

The assessment of impacts has considered the predicted concentrations of TSP, PM_{10}, deposited dust, toxic air pollutants (metals), NO_2 and odour at the sensitive receptors, with and without background air quality concentrations.

5.1 CONTOUR PLOTS

The concentration or deposition contours for the modelled domain are presented in *Annex B* for the highest predicted concentration in the five modelled years. Contours plots have been presented without the background concentrations as the elevated background concentrations for certain species do not allow the scale of the predicted results to be clearly demonstrated, or that certain species do not have available background concentrations in the public domain.

5.2 MODELLING RESULTS

The predicted concentrations are to be assessed against the assessment criteria at the nearest existing off-site sensitive receptors (R1 – R20), as listed previously in *Table 2.5*. It is noted that since R11 – R20 are set up to be immediately adjacent to the Site boundary and beyond, the maximum offsite impacts are also included within the results reported for R11 – R20.

The following tables report the incremental impact from the site, the maximum background concentration (if applicable) and the total impact (increment impact plus background) as the 100^{th} percentile concentration (or deposition), aside from toxic air pollutants and odour. Toxic air pollutants and odour are reported as the 99.9^{th} percentile and 99^{th} percentile (mixed odorants), respectively, for a Level 2 assessment, as required by the Approved Methods.

5.2.1 TSP Annual Mean

The predicted annual average TSP concentrations at the receptors were produced from the model. The highest concentration at each receptor over a 5 year period is presented in *Table 5.1* for sensitive receptors. Whilst ambient TSP is not measured at Prospect, typically PM_{10} is considered to be half of the ambient TSP value. Taking the annual average PM_{10} value of 18.4 $\mu g/m^3$ this indicates an annual average background TSP value of 36.8 $\mu g/m^3$.

The results in *Table 2.1* indicate that the total impact at all the assessed sensitive receptors are below the TSP annual assessment criterion of 90 $\mu g/m^3$.

Table 5.1 Highest Annual Average TSP Concentrations at Receptors over 5 years

Sensitive Receptor	X	Y	Maximum TSP Concentration (Increment)[1] (µg/m³)	Background Air Quality[2] (µg/m³)	Increment plus background (µg/m³)	Impact Assessment Criterion (µg/m³)
R1	306993	6263656	0.22	36.8	37.0	
R2	306975	6263528	0.19	36.8	37.0	
R3	306963	6263414	0.14	36.8	36.9	
R4	305627	6263452	0.09	36.8	36.9	
R5	305527	6263624	0.07	36.8	36.9	
R6	305475	6263762	0.06	36.8	36.9	
R7	305584	6264114	0.06	36.8	36.9	
R8	306081	6264458	0.08	36.8	36.9	
R9	306603	6264395	0.07	36.8	36.9	
R10	307080	6264227	0.06	36.8	36.9	90
R11	306442	6263762	0.04	36.8	36.8	
R12	306531	6263749	5.53	36.8	42.3	
R13	306602	6263739	3.19	36.8	40.0	
R14	306653	6263748	1.89	36.8	38.7	
R15	306728	6263659	2.06	36.8	38.9	
R16	306723	6263581	1.41	36.8	38.2	
R17	306489	6263446	1.85	36.8	38.6	
R18	306406	6263371	1.20	36.8	38.0	
R19	306325	6263369	1.01	36.8	37.8	
R20	306423	6263682	12.98	36.8	49.8	

1. Maximum at each of the receptors over 5 years.
2. Typically PM_{10} is considered to be half of the ambient TSP value. Taking the annual average PM_{10} value of 18.4 µg/m³ this indicates an annual average background TSP value of 36.8 µg/m³

5.2.2 *Dust Deposition Annual Mean*

With an unknown background, the maximum allowable increase in deposited dust is 2 g/m²/month. *Table 5.2* shows the highest annual average dust deposition at each of the receptors produced from 5 years of data. The predicted deposition levels at all of the sensitive receptors are below the assessment criteria (*Table 5.2*).

Table 5.2 Highest Annual Average Dust Deposition at Receptors over 5 years

Sensitive Receptor	X	Y	Annual Average Dust Deposition (Increment)[1] ($g/m^2/month$)	Impact Assessment Criterion ($g/m^2/month$)
R1	306993	6263656	0.03	2 (allowable increase)
R2	306975	6263528	0.03	
R3	306963	6263414	0.02	
R4	305627	6263452	0.01	
R5	305527	6263624	0.01	
R6	305475	6263762	0.01	
R7	305584	6264114	0.01	
R8	306081	6264458	0.01	
R9	306603	6264395	0.01	
R10	307080	6264227	0.01	
R11	306442	6263762	0.01	
R12	306531	6263749	0.90	
R13	306602	6263739	0.61	
R14	306653	6263748	0.33	
R15	306728	6263659	0.20	
R16	306723	6263581	0.14	
R17	306489	6263446	0.18	
R18	306406	6263371	0.12	
R19	306325	6263369	0.11	
R20	306423	6263682	1.42	

1. Maximum at each of the receptors over 5 years.

5.2.3 *PM_{10} Annual Mean*

The highest annual average PM_{10} concentrations at each receptor are presented in *Table 5.3*. The corresponding background concentration for the year in which the maximum concentration was predicted is also presented. The addition of the background concentration and the maximum increment results concentrations below the annual mean criteria for PM_{10} (*Table 5.3*).

Table 5.3 Maximum Annual Average PM_{10} Concentrations at Receptors over 5 years

Sensitive Receptor	X	Y	Annual Average PM_{10} Concentration (Increment)[1] (µg/m³)	Background Air Quality (µg/m³)	Increment plus Background (µg/m³)	Impact Assessment Criterion (µg/m³)
R1	306993	6263656	0.13 (2009)	25.8	25.9	30
R2	306975	6263528	0.12 (2009)	25.8	25.9	
R3	306963	6263414	0.09 (2009)	25.8	25.9	
R4	305627	6263452	0.06 (2012)	17.3	17.4	
R5	305527	6263624	0.05 (2012)	17.3	17.3	
R6	305475	6263762	0.04 (2012)	17.3	17.3	
R7	305584	6264114	0.04 (2012)	17.3	17.3	
R8	306081	6264458	0.05 (2011)	15.8	15.9	
R9	306603	6264395	0.05 (2012)	17.3	17.3	
R10	307080	6264227	0.04 (2012)	17.3	17.3	
R11	306442	6263762	0.03 (2009)	25.8	25.8	
R12	306531	6263749	2.61 (2012)	17.3	19.9	
R13	306602	6263739	1.55 (2012)	17.3	18.9	
R14	306653	6263748	0.95 (2008)	17.8	18.8	
R15	306728	6263659	1.04 (2008)	17.8	18.8	
R16	306723	6263581	0.73 (2010)	15.4	16.1	
R17	306489	6263446	0.93 (2010)	15.4	16.3	
R18	306406	6263371	0.63 (2012)	17.3	17.9	
R19	306325	6263369	0.55 (2012)	17.3	17.8	
R20	306423	6263682	5.93 (2010)	15.4	21.3	

1. Maximum at each of the receptors over 5 years. Corresponding worst-case year in parentheses.

5.2.4 *PM_{10} 24-Hour Mean*

As shown in *Table 2.2*, the maximum 24-hour maximum average PM_{10} background concentration for 2009 exceeds the assessment criterion. The highest 24-hour average PM_{10} concentrations at each receptor are presented in *Table 5.3*, together with the maximum 24-hour average background concentration for the relevant year in which the prediction occurred.

While the highest maximum site contribution to 24-hour average PM_{10} concentrations at each of the receptors over the modelled 5 years are below the assessment criteria, the increment plus background exceeds the assessment criteria at receptors 4, 5, 6, 7, 8, 12, 13, 14, 15, 17 and 20 (*Table 5.4*). The exceedances of the background are the result of elevated backgrounds that are either close to or above the assessment criteria.

Table 5.4 Maximum 24-hour Average PM_{10} Concentrations at Receptors over 5 years

Sensitive Receptor	X	Y	Maximum 24-hour Average PM_{10} Concentration (Increment) [1] (µg/m³)	Background Air Quality (µg/m³)	Increment plus Background (µg/m³) [2]	Impact Assessment Criterion (µg/m³)
R1	306993	6263656	2.65 (2010)	40.1	42.7	
R2	306975	6263528	2.80 (2010)	40.1	42.9	
R3	306963	6263414	1.78 (2010)	40.1	41.9	
R4	305627	6263452	1.19 (2009)	1680.3	**1681.5**	
R5	305527	6263624	0.95 (2009)	1680.3	**1681.2**	
R6	305475	6263762	0.64 (2009)	1680.3	**1680.9**	
R7	305584	6264114	0.66 (2009)	1680.3	**1681.0**	
R8	306081	6264458	0.88 (2009)	1680.3	**1681.2**	
R9	306603	6264395	0.97 (2008)	41.8	42.8	
R10	307080	6264227	0.57 (2010)	40.1	40.7	50
R11	306442	6263762	0.51 (2010)	40.1	40.6	
R12	306531	6263749	26.46 (2009)	1680.3	**1706.8**	
R13	306602	6263739	18.77 (2012)	38.7	**57.5**	
R14	306653	6263748	11.54 (2009)	1680.3	**1691.8**	
R15	306728	6263659	10.60 (2009)	1680.3	**1690.9**	
R16	306723	6263581	9.60 (2010)	40.1	49.7	
R17	306489	6263446	9.85 (2008)	41.8	**51.6**	
R18	306406	6263371	6.78 (2012)	38.7	45.5	
R19	306325	6263369	5.14 (2012)	38.7	43.8	
R20	306423	6263682	48.66 (2009)	1680.3	**1729.0**	

1. Maximum at each of the receptors over 5 years. Corresponding worst-case year in parentheses.
2. Exceedances of the impact assessment criterion are highlighted in bold font.

Level 2 Contemporaneous Assessment

The guidance document for the modelling and assessment of air pollutants (Department of Environment and Conservation, 2005) states that, where a Level 1 assessments indicates an exceedance of the impact assessment criteria, it must be demonstrated that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity through a contemporaneous assessment.

The guidance indicates that the maximum predicted concentrations at the receptors, as a result of site activities, must be matched with the corresponding 24-hour average in the background ambient air quality data. This approach also needs to be applied vice versa, in that the maximum concentrations in the ambient air quality data are matched with the corresponding predicted 24-hour average concentration from site activities at the receptors.

To facilitate this analysis, the highest maximum 24-hour average PM_{10} concentrations as a result of site operations was extracted at each of the receptors for 5 years from the model data for receptors that indicated an exceedance in the Level 1 assessment. These maximum concentrations at the receptors were matched with the corresponding 24-hour background concentration and added together to provide the increment plus background, when the concentrations at the receptors are at their highest over 5 years (*Table 5.5*).

Of the identified receptors with a cumulative exceedance in the Level 1 assessment, the contemporary analysis demonstrates that for the five modelled years all receptors, with the exception of receptor 20, indicate that there would be no additional exceedances at these receptors.

This contemporary analysis indicates that at receptor 20 there would be twenty-three additional exceedances over the five modelled years as a result of site activities and ambient air quality. Of these additional exceedances, it was predicted that:

- Three would occur using similar meteorology from 2008;
- Nine would occur using similar meteorology from 2009;
- Four would occur using similar meteorology from 2010;
- Two would occur using similar meteorology from 2011; and
- Four would occur using similar meteorology from 2012.

It is considered that the meteorology from 2009 was atypical, resulting in a higher than normal number of exceedances. It would therefore be expected that the number of additional exceedances per year would typically range from two to four.

Table 5.6 shows the maximum, non-exceedance background concentrations, together with the date on which they occurred, the predicted site contribution at the sensitive receptors and the cumulative impact of background plus site contribution for receptors which indicated an exceedance in the Level 1 assessment.

In these analyses, the results indicate that there would be:

- Two additional exceedances at receptor 13;
- One additional exceedance at receptor 14;
- One additional exceedance at receptor 15; and
- One additional exceedance at receptor 20.

The additional exceedances at receptors 14 and 15 in addition to one of the exceedances at receptor 13 is due to elevated background concentrations with contribution from the site on these occasions being minimal (less than 2 $\mu g/m^3$). Of the remaining two exceedances (receptor 13 and receptor 20), the background level was moderately high (41.5 $\mu g/m^3$ and 40.1 $\mu g/m^3$ respectively) with site contributions of 12.4 $\mu g/m^3$ and 15.6 $\mu g/m^3$ respectively.

All of the receptors which show an additional exceedance either in *Table 5.5* or *Table 5.6* are located in the industrial estate area. None of the receptors in the residential area surrounding the industrial area is predicted to experience additional exceedances. It is considered that the sensitive receptors in an industrial area should be considered as less sensitive than in residential areas as the exposed population are working rather than residing at these premises, consequently:

- Workers are typically present for 8 to 10 hours a day, 5 to 6 days a week for a working lifetime, rather than a potential of up to 24 hours a day for an entire lifetime;

- Workers are generally considered to be healthier than the general population as they do not include the very young or very old; and

- Visitors to the industrial estate would be present for a fraction of the 24 hour averaging period for PM_{10}.

Consequently, it is considered that as the additional exceedances occur only within the industrial area, this is an acceptable outcome for this type of land use and the reason why the metals recycling business is located in the centre rather than the edge of the industrial estate.

Table 5.5 Maximum 24-hour average Site contribution to PM_{10} Concentrations at the Receptors plus background

Date	Background[1] (µg/m³)	PM_{10} Maximum Predicted 24-hour average Site contribution (µg/m³) Sensitive Receptors											Increment plus Background (µg/m³) Sensitive Receptors										
		4	5	6	7	8	12	13	14	15	17	20	4	5	6	7	8	12	13	14	15	17	20
4/06/2009	21.8	1.2	0.9										23	22.7									
22/06/2009	11.9			0.6	0.7	0.9	26.5								12.5	12.6	12.8	38.4					
08/03/2012	5.6							18.8											24.4				
27/06/2009	25.2								11.5	10.6										36.7	38.8		
26/06/2008	15.5										10.6											26.1	
02/06/2009	18.7											48.7											67.4

1. Sourced from the Prospect ambient monitoring station

Table 5.6 *24-hour average Site contribution to PM10 concentrations at the sensitive receptors at the time of the highest non-exceeding background concentrations*

Date	Back-ground[1] (µg/m³)	PM_{10} Maximum Predicted 24-hour average Site contribution (µg/m³)											Increment plus Background (µg/m³)										
		Sensitive Receptors											Sensitive Receptors										
		4	5	6	7	8	12	13	14	15	17	20	4	5	6	7	8	12	13	14	15	17	20
27/11/2009	48.5	0.1	0.0	0.0	0.0	0.0	0.5	1.8	1.6	1.9	0.0	0.1	48.6	48.5	48.5	48.5	48.5	49.0	**50.3**	**50.1**	**50.4**	48.5	48.6
20/11/2009	48.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1	49.3	48.1
25/02/2009	44.7	0.0	0.0	0.0	0.1	0.0	2.9	0.5	0.4	0.5	0.0	5.1	44.7	44.7	44.7	44.8	44.7	47.6	45.2	45.1	45.2	44.7	49.8
2/10/2009	42.6	0.0	0.0	0.0	0.1	0.0	1.7	0.1	0.0	0.0	0.0	4.5	42.6	42.6	42.6	42.7	42.6	44.3	42.7	42.6	42.6	42.6	47.1
6/12/2008	41.8	0.0	0.0	0.0	0.0	0.0	0.2	1.9	2.1	2.5	0.0	0.0	41.8	41.8	41.8	41.8	41.8	42.0	43.7	43.9	44.3	41.8	41.8
16/09/2008	41.5	0.0	0.0	0.0	0.0	0.0	8.2	12.4	8.2	4.2	0.2	1.9	41.5	41.5	41.5	41.5	41.5	49.7	**53.9**	49.7	45.7	41.7	43.4
20/09/2011	41.5	0.0	0.0	0.0	0.0	0.0	0.2	1.1	1.3	0.9	0.4	0.0	41.5	41.5	41.5	41.5	41.5	41.7	42.6	42.8	42.4	41.9	41.5
25/08/2009	40.9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.8	0.0	0.0	40.9	40.9	40.9	40.9	40.9	40.9	41.1	41.1	42.7	40.9	40.9
1/07/2008	40.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.8	1.7	15.6	40.1	40.1	40.1	40.1	40.1	40.1	40.3	40.3	41.9	41.8	**55.7**
27/03/2010	40.1	0.0	0.0	0.0	0.2	0.0	2.7	1.0	0.7	0.6	0.0	0.0	40.1	40.1	40.1	40.3	40.1	42.8	41.1	40.8	40.7	40.1	40.1
26/03/2009	39.7	0.3	0.2	0.0	0.0	0.0	0.1	0.8	0.7	0.3	1.0	5.2	40.0	39.9	39.7	39.7	39.7	39.8	40.5	40.4	40.0	40.7	44.9
15/09/2008	39.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	40.7	39.2
14/10/2009	38.8	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.4	1.9	0.5	0.0	38.8	38.8	38.8	38.8	38.8	38.9	39.3	39.2	40.7	39.3	38.8
23/09/2011	38.7	0.0	0.0	0.0	0.1	0.0	1.3	2.5	1.3	0.5	0.8	3.6	38.7	38.7	38.7	38.8	38.7	40.0	41.2	40.0	39.2	39.5	42.3
26/10/2012	38.7	0.0	0.0	0.0	0.0	0.0	3.9	6.2	4.7	1.8	0.0	0.0	38.7	38.7	38.7	38.7	38.7	42.6	44.9	43.4	40.5	38.7	38.7
12/09/2009	38.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	39.7	38.1
25/01/2011	37.5	0.1	0.0	0.0	0.0	0.0	8.5	7.2	4.8	1.8	0.0	1.5	37.6	37.5	37.5	37.5	37.5	46.0	44.7	42.3	39.3	37.5	39.0

1. Sourced from the Prospect ambient monitoring station

5.2.5 *Hammermill Metal Emissions*

Particulate emissions of less than 2.5 µm in aerodynamic diameter ($PM_{2.5}$) are also emitted from the hammermill in operation. As discussed, there is no assessment criterion for $PM_{2.5}$ within the Approved Methods. The USEPA Speciate program has however measured the constituents of $PM_{2.5}$ from hammermills and the following species are emitted as $PM_{2.5}$, which also have an assessment criterion within the Approved Methods:

- Chromium;
- Copper;
- Lead;
- Manganese; and
- Nickel.

Table 5.7 Predicted concentrations at identified sensitive receptors for metals associated with $PM_{2.5}$ emissions from the Hammermill. *Table 5.7* shows the predicted 1 hour average concentrations at the identified sensitive receptors together with the relevant assessment criteria. It can be seen from *Table 5.7* that none of the predicted concentrations exceeds the relevant assessment criteria for these species.

Table 5.7 Predicted concentrations at identified sensitive receptors for metals associated with $PM_{2.5}$ emissions from the Hammermill

Sensitive Receptor	Chromium as Chromium VI (µg/m³) 1 hr mean	Copper (µg/m³) 1hr Mean	Lead (µg/m³) Annual Mean	Manganese (µg/m³) 1 hr mean	Nickel (µg/m³) 1 hr mean
1	0.0005	0.0011	0.00007	0.0010	0.0004
2	0.0004	0.0011	0.00006	0.0009	0.0003
3	0.0004	0.0009	0.00005	0.0008	0.0003
4	0.0002	0.0006	0.00004	0.0005	0.0002
5	0.0002	0.0005	0.00003	0.0004	0.0002
6	0.0002	0.0004	0.00003	0.0004	0.0001
7	0.0001	0.0004	0.00002	0.0003	0.0001
8	0.0002	0.0004	0.00004	0.0004	0.0001
9	0.0002	0.0004	0.00003	0.0004	0.0001
10	0.0001	0.0004	0.00002	0.0003	0.0001
11	0.0001	0.0003	0.00002	0.0002	0.0001
12	0.0043	0.0107	0.00119	0.0094	0.0033
13	0.0028	0.0070	0.00067	0.0061	0.0022
14	0.0019	0.0049	0.00045	0.0043	0.0015
15	0.0021	0.0053	0.00046	0.0046	0.0016
16	0.0017	0.0042	0.00029	0.0037	0.0013
17	0.0023	0.0058	0.00038	0.0051	0.0018
18	0.0014	0.0035	0.00029	0.0031	0.0011
19	0.0013	0.0032	0.00029	0.0028	0.0010
20	0.0132	0.0331	0.00399	0.0291	0.0102
Criterion	0.09	3.7	0.5	18	0.18

5.2.6 *Odour*

The evaluation of odour impacts requires the estimation of short or peak concentrations on the time scale of less than one second. The peak odour impacts are estimated from the 1-hour odour modelling results by multiplying with the appropriate factor from Table 6.1 of the Approved Methods. The selection of the appropriate factor to estimate peak concentrations in flat terrain is based on the wet scrubber (volume source) of the hammer mill, which is the biggest source of odour (see *Sections A1.5* and *A1.6* in *Annex A)*, i.e. the value of 2.3 for a volume source.

It is noted that the odour concentrations are emitted from the wet scrubber (WSS01) and the metals cutting operations (C1 – C2). From the analysis of the contour plots and the results, it has been assessed that the C1 – C2 fugitive source is best represented as point sources in the modelling. The results in *Table 5.8* are reported for WSS01 as a volume source and C2-C2 as point sources (*Annex D*).

In *Table 5.8*, the incremental odour results are reported for the nearest sensitive receptors (99th percentile for mixed odorants for a Level 2 assessment), as required by the Approved Methods. In addition, the maximum incremental offsite odour impact (99th percentile) has also been reported, as requested by the EPA. No odour background concentrations are available for this assessment.

Table 5.8 Maximum predicted peak odour concentrations at Receptors and maximum offsite odour concentrations over 5 years

Sensitive Receptor	X	Y	Year	Maximum peak odour concentration[1] (OU)	Impact assessment criterion (OU)
1	306993	6263656	2009	0.0	
2	306975	6263528	2009	0.0	
3	306963	6263414	2008	0.0	
4	305627	6263452	2012	0.0	
5	305527	6263624	2012	0.0	
6	305475	6263762	2012	0.0	
7	305584	6264114	2012	0.0	
8	306081	6264458	2011	0.0	
9	306603	6264395	2012	0.0	2
10	307080	6264227	2012	0.0	
11	307442	6263762	2009	0.0	
12	306531	6263749	2010	**3.0**	
13	306602	6263739	2010	2.0	
14	306653	6263748	2008	1.0	
15	306728	6263659	2010	1.0	
16	306723	6263581	2008	1.0	
17	306489	6263446	2009	1.0	

Sensitive Receptor	X	Y	Year	Maximum peak odour concentration[1] (OU)	Impact assessment criterion (OU)
18	306406	6263371	2012	1.0	
19	306325	6263369	2011	1.0	
20	306423	6263682	2011	**9.0**	
	Maximum offsite location			9.0	

1. Maximum at each of the receptors over 5 years.

Based on an impact assessment criterion of 2 OU (for urban population of >2000 people) as presented in *Table 3.1*, it can be seen that odour impacts from the Site at the sensitive receptors are below the assessment criterion for all locations except receptor 13 and receptor 20.

It is considered that the odour criterion of 2 OU is for a residential area rather than for an industrial area. Whilst this is not explicit in the Approved Methods, this is indicated by the detail of Table 7.5 of the Approved Methods which includes a column heading indicating size of impacted population and when describing rural areas provides a cell entry that refers to residences only rather than sensitive receptors which would also include work places such as farms or industrial areas.

Further, it is considered that industrial areas are expected to have a higher level of odour impact compared to residential areas, and this is part of the purpose of separating industrial areas from residential areas and placing industries that have the potential to result in amenity impacts (such as odour) at the centre of industrial estates in order that they do not impact residential areas. In the case of the subject site, this is the case.

Consideration of the contour plot (*Figure B.8*) shows that the 2 OU contour is not predicted to extend beyond the industrial area and that elevated levels of odour impact (greater than 7 OU[2], 99th percentile) occur within a limited area immediately adjacent to the western boundary of the facility. Given the nature of the surrounding land use this is considered to be an acceptable impact to the surrounding land use.

5.2.7 *NO_2 Annual Mean*

Nitrogen oxide (NO_X) is emitted by the metals cutting process (see *Section A1.6* of *Annex A*); however, it is NO_2 that pertains to human health impact. NO_X consists of nitrogen oxide (NO) and NO_2, but NO will undergo oxidation in the atmosphere to become NO_2. This has been taken in to account using the ozone limiting method as recommended in the Approved Methods.

[2] 7 OU, 99th percentile is the acceptable standard of odour in a rural setting.

This assessment has used a Level 1 assessment, which uses the maximum predicted annual mean concentrations of the five modelled together with the average mean for NO_2 and ozone (O_3) together with the ozone limiting method to predict site contributions to annual mean NO_2 concentrations.

The results of mean NO_2 concentrations for an annual averaging period are reported for the nearest sensitive receptors in *Table 5.9*. It is noted that the results are reported for metals cutting as a point source.

With an annual mean assessment criterion of 62 µg/m³, it can be seen from the results in *Table 5.9* that the NO_2 impacts at the sensitive receptors on an annual basis are below the assessment criterion.

Table 5.9 Maximum Annual Average NO_2 Concentrations at Receptors over 5 years

Sensitive Receptor	X	Y	Annual Average NO_2 Concentration (Increment) [1] (µg/m³)	Background Air Quality (µg/m³)	Increment plus Background (µg/m³)	Impact Assessment Criterion (µg/m³)
1	306993	6263656	0.32 (2009)	20.70	21.02	62
2	306975	6263528	0.34 (2009)	20.70	21.04	
3	306963	6263414	0.27 (2009)	20.70	20.97	
4	305627	6263452	0.13 (2012)	18.80	18.93	
5	305527	6263624	0.11 (2012)	18.80	18.91	
6	305475	6263762	0.09 (2012)	18.80	18.89	
7	305584	6264114	0.08 (2012)	18.80	18.88	
8	306081	6264458	0.14 (2011)	18.80	18.94	
9	306603	6264395	0.12 (2012)	18.80	18.92	
10	307080	6264227	0.11 (2012)	18.80	18.91	
11	307442	6263762	0.08 (2012)	18.80	18.88	
12	306531	6263749	2.66 (2011)	18.80	21.46	
13	306602	6263739	2.49 (2012)	18.80	21.29	
14	306653	6263748	1.94 (2012)	18.80	20.74	
15	306728	6263659	1.61 (2012)	18.80	20.41	
16	306723	6263581	1.60 (2009)	20.70	22.30	
17	306489	6263446	5.10 (2008)	20.70	25.80	
18	306406	6263371	3.95 (2012)	18.80	22.75	
19	306325	6263369	3.28 (2012)	18.80	22.08	
20	306423	6263682	10.34 (2011)	18.80	29.14	

1. Maximum at each of the receptors over 5 years. Year when maximum concentration occurred provided in parentheses.

5.2.8 NO_2 1-Hour Mean

In evaluating the predicted 1-hour average concentrations, a level 1 assessment has been used in the first instance. A level 1 assessment uses the maximum predicted (100th percentile) concentration together with the maximum background concentration of NO_2 and O3 with the ozone limiting method to indicate the maximum potential impact to the surrounding sensitive receptors. It is noted that the results are reported for metals cutting as a point source {TBC} (*Annex D*).

With an assessment criterion of 246 μg/m^3, it can be seen from the results in *Table 5.10* that the NO_2 impacts at the sensitive receptors on an hourly basis are below the assessment criterion for receptors 1 to 11 and above the criterion for receptors 12 to 20. Receptors 12 to 20 were therefore taken forward to a contemporaneous assessment.

Table 5.10 Maximum Hourly Average NO_2 Concentrations at Receptors over 5 years

Sensitive Receptor	X	Y	Maximum 1-hour Average NO_2 Concentration (Increment) [1] (μg/m^3)	Background Air Quality (μg/m^3)	Increment plus Background (μg/m^3)	Impact Assessment Criterion (μg/m^3)
1	306993	6263656	51.61	80.84	132.45	
2	306975	6263528	66.97	80.84	147.81	
3	306963	6263414	78.66	73.32	151.98	
4	305627	6263452	32.69	95.88	128.57	
5	305527	6263624	33.82	95.88	129.70	
6	305475	6263762	18.38	94.00	112.38	
7	305584	6264114	13.96	73.32	87.28	
8	306081	6264458	36.19	95.88	132.07	
9	306603	6264395	29.99	95.88	125.87	
10	307080	6264227	16.24	73.32	89.56	246
11	307442	6263762	22.56	80.84	103.40	
12	306531	6263749	195.97	94.00	**289.97**	
13	306602	6263739	195.84	94.00	**289.84**	
14	306653	6263748	182.28	94.00	**276.28**	
15	306728	6263659	172.73	94.00	**266.73**	
16	306723	6263581	250.24	73.32	**323.56**	
17	306489	6263446	254.22	94.00	**348.22**	
18	306406	6263371	245.34	95.88	**341.22**	
19	306325	6263369	238.06	95.88	**333.94**	
20	306423	6263682	285.20	95.88	**381.08**	

1. Maximum at each of the receptors over 5 years. Year when maximum concentration occurred provided in parentheses.

Table 5.11 Maximum 1-hour average Site contribution to NO_2 Concentrations at the Receptors exceeding the level 1 assessment plus background

Date	Background[1] (µg/m³)	NO_2 Maximum Predicted 1-hour average Site contribution (µg/m³) Sensitive Receptors									Increment plus Background (µg/m³) Sensitive Receptors								
		12	13	14	15	16	17	18	19	20	12	13	14	15	16	17	18	19	20
25/01/2011 10:00	30.1	136.1									166.2								
08/11/2012 12:00	47		108.9									155.9							
02/01/2010 16:00	30.1			90.5									120.6						
04/02/2012 08:00	30.1				104									134					
08/11/2012 11:00	47					127.5									174				
20/03/2010 07:00	77.1						189.3									**266.4**			
31/01/2008 13:00	39.5							164.7									204.2		
19/03/2009 07:00	45.1								121.1									166.2	
05/12/2009 08:00	35.7									145.3									181.1

Background concentrations are the 1 hour average daily maximum concentrations from the EPA Prospect monitoring station

Table 5.12 ***Maximum 1-hour average Site contribution to NO_2 Concentrations at the Receptors exceeding the level 1 assessment plus background during the day of maximum background concentration***

Receptor	Maximum Background NO_2 Concentration (µg/m³)	Maximum Site Contribution of NO_2 to Receptor on Day of maximum 1-Hour Background NO_2 Concentration (µg/m³)	Total NO_2 (Max background plus site contribution) Concentration (µg/m³)
12		95.7	191.6
13		79.7	175.5
14		53.4	149.2
15		24.9	120.7
16	95.9	26.6	122.5
17		154	249.9
18		19.1	114.9
19		19.4	115.3
20		25.7	97.4

1. Background concentrations are the 1 hour average daily maximum concentrations from the EPA Prospect monitoring station

Level 2 Contemporaneous Assessment

The Level 2 contemporaneous assessment indicates that all receptors meet the assessment criterion of 246 µg/m³ with the exception of receptor 13. From the analysis it was found that of the five years modelled only one hour exceeded the criterion out of the five years. Given that the surrounding land use, where the exceedance is predicted is an industrial estate the potential for an additional exceedance every five years is considered to be an acceptable risk.

Further it should be considered that as an industrial setting, the criterion set by Safe Work Australia may be a more appropriate measure. Safe Work Australia sets the criterion for NO_2 as 5,600 µg/m³ as an eight hour mean. The maximum concentration, using a Level 1 assessment for an eight hour mean at receptor 13 is 180 µg/m³, substantially below concentrations which are considered safe for the Australian workforce.

5.2.9 *Iron Oxide Fumes*

Table 5.13 presents the 99.9th percentile hourly and 100th percentile 8-hour average iron oxide fume concentrations predicted by the modelling at the sensitive receptors and at any offsite location.

Table 5.13 ***99.9th percentile predicted 1-hour mean iron oxide fume concentrations at Receptors and 8-hour maximum offsite iron oxide fume concentrations over 5 years***

Sensitive Receptor	X	Y	Maximum 1-hour Average Iron Oxide Fume Concentration (Increment) 1 (µg/m³)	Maximum 8-hour Average Iron Oxide Fume Concentration (Increment) 1 (µg/m³)
1	306993	6263656	87.01 (2011)	42.90 (2009)
2	306975	6263528	90.86 (2009)	47.25 (2009)
3	306963	6263414	79.65 (2011)	38.23 (201)
4	305627	6263452	48.60 (2009)	19.93 (2009)
5	305527	6263624	39.57 (2009)	20.24 (2009)
6	305475	6263762	28.71 (2012)	18.63 (2012)
7	305584	6264114	29.25 (2011)	16.61 (2011)
8	306081	6264458	26.60 (2010)	16.83 (2009)
9	306603	6264395	28.29 (2009)	37.36 (2008)
10	307080	6264227	25.73 (2012)	8.81 (2012)
11	307442	6263762	25.04 (2012)	10.95 (2009)
12	306531	6263749	**680.44** (2010)	404.64 (2009)
13	306602	6263739	**526.91** (2009)	292.41 (2009)
14	306653	6263748	**388.39** (2009)	219.53 (2009)
15	306728	6263659	**406.34** (2009)	223.87 (2009)
16	306723	6263581	**485.63** (2011)	196.72 (2009)
17	306489	6263446	**1091.60** (2011)	603.45 (2008)
18	306406	6263371	**815.00** (2008)	335.93 (2011)
19	306325	6263369	**596.42** (2008)	354.45 (2008)
20	306423	6263682	**1579.30** (2012)	1337.20 (2009)
Impact Assessment Criterion (µg/m3)			90	5000

1. Maximum at each of the receptors over 5 years. Year when maximum concentration occurred provided in parentheses.
2. Approved Methods Assessment Criterion
3. Safe Work Australia Time Weighted Average

Based on the Approved Methods toxic air pollutants criterion of 90 µg/m³, it can be seen that at the maximum offsite location and at the sensitive receptors, the predicted 1 hour concentrations at 99.9th percentile are at or below the Approved Methods assessment criterion at receptors 1 to 11 and above the Approved Methods assessment criteria at receptors 12 to 20.

As stated in the Approved Methods, the criterion for iron oxide fumes was derived from the Victorian State Environment Protection Policy for Air Quality Management (SEPP(AQM)). The criteria in the SEPP(AQM) were themselves derived from standards for occupational health with additional safety factors built in to the criteria to account for exposure at residential receptors, schools and hospitals rather than a work place environment.

There is concern, when comparing the results at locations in the surrounding industrial estate to the Approved Methods criterion, that the required levels are not appropriate for the exposure profile. The criterion contained in the Approved Methods was developed for assessment of exposure 24 hours a day, 365 days a year for an entire lifetime. The surrounding working population are likely to be exposed for 8 to 10 hours a day, 5 to 6 days a week, for up to a working lifetime.

It is considered, therefore that the more appropriate criterion for receptors 11 to 20 is that set by Safe Work Australia of 5,000 µg/m3. As shown in *Table 5.13*.

*t*he predicted concentrations at the receptors within the industrial estate (receptors 11 to 20) meet this criterion indicating there is a low risk of impact to the health of the surrounding workforce.

5.2.10 Manganese and Compounds

Table 5.14 presents the 99.9th percentile hourly and the 100th percentile 8-hour average manganese concentrations predicted by the modelling at the sensitive receptors and at any offsite location. The concentrations have been assessed against a 1-hour criterion of 0.018 mg/m^3 as per *Table 3.1*.

Table 5.14 shows that ambient manganese concentrations are below the adopted assessment criteria in the relevant locations.

Table 5.14 99.9th percentile predicted 1-hour mean manganese and compounds concentrations at Receptors and 8-hour maximum offsite manganese and compounds concentrations over 5 years

Sensitive Receptor	X	Y	Maximum 1-hour Average Manganese Fume Concentration (Increment) [1] (µg/m^3)	Maximum 8-hour Average Manganese Fume Concentration (Increment) [1] (µg/m^3)
1	306993	6263656	9.08 (2011)	4.48 (2009)
2	306975	6263528	9.48 (2009)	4.93 (2009)
3	306963	6263414	8.31 (2011)	3.99 (2011)
4	305627	6263452	5.07 (2009)	2.08 (2009)
5	305527	6263624	4.13 (2009)	2.11 (2009)
6	305475	6263762	3.00 (2012)	1.94 (2012)
7	305584	6264114	3.05 (2011)	1.73 (2011)
8	306081	6264458	2.78 (2010)	1.76 (2009)
9	306603	6264395	2.95 (2009)	3.90 (2008)
10	307080	6264227	2.69 (2012)	0.92 (2012)
11	307442	6263762	2.61 (2012)	1.14 (2009)
12	306531	6263749	**71.00** (2010)	42.23 (2009)
13	306602	6263739	**54.99** (2009)	30.52 (2009)
14	306653	6263748	**40.53** (2009)	22.91 (2009)
15	306728	6263659	**42.40** (2009)	23.36 (2009)

Sensitive Receptor	X	Y	Maximum 1-hour Average Manganese Fume Concentration (Increment) [1] (µg/m³)	Maximum 8-hour Average Manganese Fume Concentration (Increment) [1] (µg/m³)
16	306723	6263581	**50.67** (2011)	20.53 (2009)
17	306489	6263446	**113.91** (2011)	62.97 (2008)
18	306406	6263371	**85.04** (2008)	35.05 (2011)
19	306325	6263369	**62.24** (2008)	36.99 (2008)
20	306423	6263682	**164.80** (2012)	139.54 (2009)
Impact Assessment Criterion (µg/m3)			18	1000

1. Maximum at each of the receptors over 5 years. Year when maximum concentration occurred provided in parentheses.
2. Approved Methods Assessment Criterion
3. Safe Work Australia Time Weighted Average

Based on the Approved Methods toxic air pollutants criterion of 18 µg/m³, it can be seen that at the maximum offsite location and at the sensitive receptors, the predicted 1 hour concentrations at 99.9th percentile are below the Approved Methods assessment criterion at receptors 1 to 11 and above the Approved Methods assessment criteria at receptors 12 to 20.

As stated in the Approved Methods, the criterion for iron oxide fumes was derived from the Victorian State Environment Protection Policy for Air Quality Management (SEPP(AQM)). The criteria in the SEPP(AQM) were themselves derived from standards for occupational health with additional safety factors built in to the criteria to account for exposure at residential receptors, schools and hospitals rather than a work place environment.

There is concern, when comparing the results at locations in the surrounding industrial estate to the Approved Methods criterion, that the required levels are not appropriate for the exposure profile. The criterion contained in the Approved Methods was developed for assessment of exposure 24 hours a day, 365 days a year for an entire lifetime. The surrounding working population are likely to be exposed for 8 to 10 hours a day, 5 to 6 days a week, for up to a working lifetime.

It is considered, therefore that the more appropriate criterion for receptors 11 to 20 is that set by Safe Work Australia of 1,000 µg/m³. As shown in *Table 5.14, t*he predicted concentrations at the receptors within the industrial estate (receptors 11 to 20) meet this criterion indicating there is a low risk of impact to the health of the surrounding workforce.

5.2.11 Copper Dusts And Mists 1-Hour Mean

Table 5.15 presents the 99.9th percentile hourly and the 100th percentile 8-hour average copper dusts and mists concentrations predicted by the modelling at the sensitive receptors and at any offsite location.

Table 5.15 ***99.9th percentile predicted 1-hour mean copper dusts and mists concentrations at Receptors and 10-hour maximum offsite copper dusts and mist concentrations over 5 years***

Sensitive Receptor	X	Y	Maximum 1-hour Average Copper Fume Concentration (Increment) (µg/m³)	Maximum 8-hour Average Manganese Fume Concentration (Increment) (µg/m³)
1	306993	6263656	1.21 (2011)	0.60 (2009)
2	306975	6263528	1.26 (2009)	0.66 (2009)
3	306963	6263414	1.11 (2011)	0.53 (2011)
4	305627	6263452	0.68 (2009)	0.28 (2009)
5	305527	6263624	0.55 (2009)	0.28 (2009)
6	305475	6263762	0.40 (2012)	0.26 (2012)
7	305584	6264114	0.41 (2011)	0.23 (2011)
8	306081	6264458	0.37 (2010)	0.23 (2009)
9	306603	6264395	0.39 (2009)	0.52 (2008)
10	307080	6264227	0.36 (2012)	0.12 (2012)
11	307442	6263762	0.35 (2012)	0.15 (2009)
12	306531	6263749	**9.47** (2010)	5.63 (2009)
13	306602	6263739	**7.34** (2009)	4.07 (2009)
14	306653	6263748	**5.41** (2009)	3.06 (2009)
15	306728	6263659	**5.66** (2009)	3.12 (2009)
16	306723	6263581	**6.76** (2011)	2.74 (2009)
17	306489	6263446	**15.19** (2011)	8.40 (2008)
18	306406	6263371	**11.34** (2008)	4.67 (2011)
19	306325	6263369	**8.30** (2008)	4.93 (2008)
20	306423	6263682	**21.98** (2012)	18.61 (2009)
Impact Assessment Criterion (µg/m3)			3.7	200

1. Maximum at each of the receptors over 5 years. Year when maximum concentration occurred provided in parentheses.
2. Approved Methods Assessment Criterion
3. Safe Work Australia Time Weighted Average

Based on the Approved Methods toxic air pollutants criterion of 18 µg/m³, it can be seen that at the maximum offsite location and at the sensitive receptors, the predicted 1 hour concentrations at 99.9th percentile are below the Approved Methods assessment criterion at receptors 1 to 11 and above the Approved Methods assessment criteria at receptors 12 to 20.

As stated in the Approved Methods, the criterion for iron oxide fumes was derived from the Victorian State Environment Protection Policy for Air Quality Management (SEPP(AQM)). The criteria in the SEPP(AQM) were themselves derived from standards for occupational health with additional safety factors built in to the criteria to account for exposure at residential receptors, schools and hospitals rather than a work place environment.

There is concern, when comparing the results at locations in the surrounding industrial estate to the Approved Methods criterion, that the required levels are not appropriate for the exposure profile. The criterion contained in the Approved Methods was developed for assessment of exposure 24 hours a day, 365 days a year for an entire lifetime. The surrounding working population are likely to be exposed for 8 to 10 hours a day, 5 to 6 days a week, for up to a working lifetime.

It is considered, therefore that the more appropriate criterion for receptors 11 to 20 is that set by Safe Work Australia of 1,000 $\mu g/m^3$. As shown in *Table 5.15, t*he predicted concentrations at the receptors within the industrial estate (receptors 11 to 20) meet this criterion indicating there is a low risk of impact to the health of the surrounding workforce.

6 BENCHMARKING SITE MITIGATION/ MANAGEMENT FOR AIR QUALITY AGAINST RECOMMEN DED INDUSTRY BEST PRACTICES

The operations of the Site activities under the future 350,000 tpa scenario will be undertaken using recommended industry best practices for the proposed air quality mitigation and management, where such mitigation and management are considered to be relevant to the Site operations. The benchmarking of the major process steps of the Site operations against industry best practices is provided in *Table 6.1*.

The recommended industry best practices is based on a comprehensive guideline

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Table 6.1 Benchmarking Site Mitigation/ Management for Air Quality against Industry Best Practices

Process	Industry Best Practices	Site Mitigation
Control of waste input	<u>Implementation of acceptance procedure</u> BAT[1] recommendation: Operators should select only appropriate feed materials for processing, to achieve low emission levels in line with overall BAT objectives.	1) Site management has established guidelines/framework on the types and quality of incoming waste materials to be accepted. Scrap metals such as those that contain concealed items such as LPG cylinders, or contaminated materials are not to be accepted. 2) All site personnel are to be trained on identifying the types of incoming waste material that are unacceptable to be recycled on site.
	<u>Waste inputs</u> BAT recommendation: Operators should follow a clear documented and auditable procedure for the assessment of potential incoming feed material.	3) Site management has established procedures for assessment of incoming feed material, in line with the guidelines on the types and quality of incoming material that can be accepted. The procedures include, but are not limited to: i) screening of delivery paperwork; ii) weighing of incoming materials; iii) visual inspection; iii) spot sampling of materials to confirm their suitability; iv) notification of non-compliance with paperwork descriptions etc.
	<u>Control of incoming materials</u> BAT recommendation: Operators should ensure that materials received at the	4) The operator of the mobile material handler will visually check the feed material while loading it onto the conveyor. 5) The incoming materials will pass

Process	Industry Best Practices	Site Mitigation
	installation are suitable for shredding.	the control cabin, where an operator will also visually check incoming materials. 6) Metal pieces that are too large to be loaded onto conveyors for transferring to the hammermill for shredding will be manually pre-shredded at designated locations within the Site.
	<u>Implementation of waste screening</u> BAT recommendation: Operators should establish quarantine areas for materials that are prohibited, awaiting full inspection, or awaiting testing or removal.	7) LPG cylinders will be removed from car before they are fed through the facility. Site has established a quarantine area to store LPG cylinders before being removed offsite for decommissioning and disposal. Manual inspection of the quarantined area is undertaken daily [TBC] to ensure that the LPG cylinders are in good condition. 8) Petrol tanks will be emptied by draining petrol and oil from tanks and collecting them in above ground storage tanks and removed offsite for processing. Manual inspection of the storage tanks is undertaken daily [TBC] to ensure that the tanks are in good condition.
	<u>Dedicated reception area</u> BAT recommendation: Operators should clearly designate a material reception area, with staff controlling the inspection, reception and validation of materials at the installation, trained in their role.	9) The Site has a materials reception area, where materials will be pre-checked, pre-weighed and pre-shredded (if the size is too big). The work will be undertaken by personnel trained in their roles to identify wastes that are not appropriate to be processed.
Management of process generated emissions	<u>Residue management planning</u> BAT recommendation: Operators should ensure that all materials (including waste products, residues and other materials) are stored in such a way as to prevent or reduce emissions from the installation.	10) The Site will prepare a residue management plan to ensure that all materials (including waste products, residues and other materials) are stored in an appropriate manner to prevent emissions to atmosphere.
	<u>Material handling techniques</u> BAT recommendation: Operators should prevent or reduce emissions including dust from material handling and transport. BAT recommendation: Operators should produce	11) The Site will produce and regularly update a detailed material handling plan that reduces emissions to atmosphere. In particular, emissions from the materials handling and transport operations will be mitigated through the use of water sprays which will reduce dust emissions to atmosphere by 70% or more in

Process	Industry Best Practices		Site Mitigation
	and update a documented detailed material handling plan.		comparison to unmitigated emissions.
	Covering conveyor belts BAT recommendation: Operators should prevent or reduce the generation of dusts or other emission by the movement and handling of materials by conveyor belt. BAT recommendation: Operators should ensure that conveyors, transfer points and drop points downstream of the hammermill, are covered to prevent the release of dusts and particulates.	12)	The Site does not anticipate the conveyors and transfer points to be large sources of emissions, and therefore they will not be covered or enclosed.
Process efficiency	Process efficiency BAT recommendation: Operators should monitor and manage the installation's processing efficiency.	13)	The Site will keep a detailed site record of processing of metals with a view to managing the processing efficiency of the site and to determine whether any further efficiencies can be achieved, thus reducing atmospheric emissions.
	Accident management plan BAT recommendation: Operators should ensure that the installation is prepared to deal with unusual events/ accidents to prevent and control the uncontrolled release of emissions to the environment.	14)	The Site will update the accident management plan for the revised Site layout and operations.
	Site diary BAT recommendation: Operators should keep a detailed site diary or other similar method to record daily events for the installation.	15)	The Site will continue to keep a detailed site diary to record daily events for the operation.
Utilities and raw material management	Energy consumption BAT recommendation: Operators should keep a detailed site diary or other similar method to record daily events for the installation. BAT recommendation: Operators should meter the consumption of electrical power within the installation to produce detailed power	16)	The Site will keep a detailed site diary or similar to record daily events for the Site. Electrical consumption will be monitored to provide an understanding of power use requirements with a view to reducing power consumption and improving energy efficiency.

Process	Industry Best Practices	Site Mitigation
	use assessments. BAT recommendation: Operators should produce detailed production/ power reports to inform on the improvements to energy efficiency.	
	<u>Control and abatement of emissions to air</u> BAT recommendation: Operators should prevent or reduce dust and other emissions to air from the installation. BAT recommendation: Operations should undertake regular air emission and stack emission monitoring on their installations.	17) Site has installed a wet scrubber for the hammermill to control dust emissions. The wet scrubber is cleaned and maintained regularly and its performance monitored to ensure it meets the required efficiency. 18) All truck transfer (loading/unloading) and materials handling process onsite are dust controlled via water sprays/misters using water collected at the onsite dam (used to capture e.g. rainwater, water run-off from roofs). 19) Site surfaces onsite will be sealed to prevent dust re-entrainment from movements from vehicles and other equipment. 20) Site surfaces are regularly swept to reduce dust and debris accumulation, and water (from the onsite dam) is used to dampen down the site surfaces to suppress dust. 21) Through good control of waste input, materials received at the site are large free from materials which may produce emissions. 22) Undesirable items (such as LPG cylinders) are removed from the feed material to prevent flame events which produce emissions. 23) Plans for fire-fighting are in place, equipment is provided, and staff are trained in its use, to prevent/ control flame events which produce emissions.

1 – BAT: Best Available Technology

7 *CONCLUSION*

An air quality assessment has been undertaken for an expansion and increase in the handling capacity of Sell and Parker's existing waste metal recovery, processing and recycling facility at Blacktown, New South Wales.

The number and type of sources of emission from the site were thoroughly investigated and appropriately assessed for inclusion in the air dispersion modelling. The air dispersion modelling results indicated that:

- TSP:
  - Annual mean concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
- Dust deposition:
  - Annual mean concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
- PM_{10}:
  - Annual mean concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
  - the maximum predicted 24-hour average PM_{10} concentration together with the maximum measured background concentration results in levels that exceed the assessment criteria at ten of the sensitive receptors due to the elevated background ambient air quality concentration in this area;
  - Using a contemporary analysis additional exceedances of the criterion contained in the Approved Methods are predicted to occur at sensitive receptors located immediately adjacent to the Site within the industrial area. These exceedances of the standard are considered to be acceptable as:
    - Workers are typically present for 8 to 10 hours a day, 5 to 6 days a week for a working lifetime, rather than a potential of up to 24 hours a day for an entire lifetime;
    - Workers are generally considered to be healthier than the general population as they do not include the very young or very old;
    - Visitors to the industrial estate would be present for a fraction of the 24 hour averaging period for PM10.

- Chromium assumed to be chromium VI:
    - 1-hour 99.9th percentile concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
- Lead:
- Annual mean concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
- Nickel:
    - 1-hour 99.9th percentile concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
- Odour:
    - Peak 99th percentile concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods with the exception of two receptors in the industrial estate. Given the location of the exceedances it is considered that amenity impacts within an industrial estate are acceptable as this is the purpose of setting aside land for industrial rather than residential use.
- NO_2:
- Annual mean concentrations at all sensitive receptors will be below the assessment criterion contained in the Approved Methods.
    - the maximum predicted 1-hour average NO_2 concentration together with the maximum measured background concentration results in levels that exceed the assessment criteria at nine of the sensitive receptors; and
    - Using a contemporary analysis additional exceedances of the criterion contained in the Approved Methods are predicted to occur at one sensitive receptor located immediately adjacent to the Site within the industrial area. This single additional exceedances was found to be a one hour occurrence within 5 years of modelled data. It is considered likely that this one result in an anomaly of modelling and the use of the 100th percentile 1 hour result.
- Iron oxide fume:
    - the maximum (99.9th percentile) predicted 1-hour average iron oxide fume concentration is predicted to be in excess the assessment criteria contained in the Approved Methods at nine of the sensitive receptors that are all within the industrial estate. Levels are therefore predicted to be at levels below the Approved Methods criterion within all residential areas;

- the criteria for iron oxide fume contained in the Approved Methods is taken from the Victorian State Environment Protection Policy for Air Quality Management, and was developed for application in residential areas; and
- The maximum predicted 8-hour average iron oxide fume concentration complies with Safe Work Australia guidelines at all sensitive receptors indicating that impact is safe at workplaces within the industrial area.

- Manganese and compounds:
  - the maximum (99.9th percentile) predicted 1-hour average manganese concentration is predicted to be in excess the assessment criteria contained in the Approved Methods at nine of the sensitive receptors that are all within the industrial estate. Levels are therefore predicted to be at levels below the Approved Methods criterion within all residential areas;
  - the criteria for iron oxide fume contained in the Approved Methods is taken from the Victorian State Environment Protection Policy for Air Quality Management, and was developed for application in residential areas; and
  - the maximum predicted 8-hour average iron oxide fume concentration complies with Safe Work Australia guidelines at all sensitive receptors indicating that impact is safe at workplaces within the industrial area.

- Copper and compounds:
  - the maximum (99.9th percentile) predicted 1-hour average copper concentration is predicted to be in excess the assessment criteria contained in the Approved Methods at nine of the sensitive receptors that are all within the industrial estate. Levels are therefore predicted to be at levels below the Approved Methods criterion within all residential areas;
  - The criteria for iron oxide fume contained in the Approved Methods is taken from the Victorian State Environment Protection Policy for Air Quality Management, and was developed for application in residential areas; and
  - The maximum predicted 8-hour average iron oxide fume concentration complies with Safe Work Australia guidelines at all sensitive receptors indicating that impact is safe at workplaces within the industrial area.

8 LIMITATIONS

This report was prepared in accordance with the scope of work outlined and/or referenced within this report and subject to the applicable cost, time and other constraints. ERM performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental profession. No warranties, expressed or implied, are made.

ERM makes no warranty concerning the suitability of the Site for any purpose or the permissibility of any use, development or re-development of the Site. Use of the Site for any purpose may require planning and other approvals and, in some cases, EPA and accredited site auditor approvals. ERM offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environment works.

Except as otherwise stated, ERM's assessment is limited to specified environmental conditions associated with the subject Site and does not evaluate operational or other conditions of any part of the Site (including any buildings, equipment or infrastructure).

This assessment is based on Site conditions described in the report, and information provided by Sell and Parker Pty Ltd or other people with knowledge of the Site conditions. Conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved with the project and, while normal checking of the accuracy of data has been conducted, ERM assumes no responsibility or liability for errors in data obtained from such sources, regulatory agencies and/or any other external sources, nor from occurrences outside the scope of this project.

It is unlikely that the results and estimations presented in this report will represent the extremes of conditions within the Site. Conditions including impact concentrations can change in a limited period of time. ERM have used the last five years of meteorology in assessing the potential for impact to surrounding land use. No guarantee is provided that this contains the worst case meteorological conditions that could ever occur, and higher ground level concentrations than predicted in this assessment are possible. Only the chemicals specifically referred to in this report have been considered. ERM makes no statement or representation as to the existence (or otherwise) of any chemicals other than those specifically referred to herein. Except as otherwise specifically stated in this report, ERM makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials ("ACM") on the Site.

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This report does not constitute legal advice.

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Annex A

Emission Estimation

A.1 EMISSIONS ESTIMATION METHODOLOGY

Annex A provides a description of the methodology used to derive the emission estimates for each source type together with the input data used in the emission estimation.

The general equation for emissions estimation is:

Equation A.1 General Equation for Emission Estimation

$$Ei = A \times EFi$$

where:
Ei = Emission of substance i (kg/day)
A = Activity rate (quantity of materials handled through the source) (t/day)
EFi = Emission factor of substance i (kg/t)

A.1.1 Source Screening

The site activities were screened to ascertain any activities that would not produce a sufficient emission to warrant inclusion in the dispersion model. Complex air quality dispersion models, such as CALPUFF, take increasing amounts of time to run as the complexity of the site increases.

One drop point was considered adequate for the drop off of non-ferrous product by the public to the non-ferrous processing area. The building is enclosed and materials inside the shed are sorted and packed for transport off-site to end users.

Transfer of large items to the shear, the shearing process and loading of shear product onto truck for transport off-site were all deemed activities that would generate few emissions of particulate matter. The material taken to the shear was described as large (i.e. railway sleepers etc.) that were simply cut into more manageable sizes.

The post shredder processing building that processes the 'floc' is an enclosed building designed to recover additional materials from the initial recovery process. It was deemed that the building would not provide an additional source of particulate matter once the conveyor had delivered the 'floc' into the enclosed shed.

A.1.2 Materials Handling/Transfer Points

The materials handling sources include materials handling of raw material, shredded material, product or waste material by front end loaders and/or other material handling equipment fitted with grapples.

The National Pollution Inventory (NPI) Manual for Mining (Department of Sustainability, Environment, Water, Population and Communities, 2012) was used to estimate the emissions from the materials handling processes.

The default emission factors for TSP and PM_{10} are 0.005 kg/t and 0.002 kg/t, respectively, for materials handling of high moisture content ores from metalliferous mines. The high moisture content ore emission factors were selected on the basis that the particulate matter fractions from metals recycling will be much larger than that for metalliferous mines.

The resulting emission factor was fed into *Equation A.1* and applied to every hour the source is operational (6am-8pm for all materials handling operations).

Each of the sources involved in materials handling processes (MH01-MH11), will operate with water suppression controls, which will result in a 70% reduction in emissions.

Transfer points (TP01-TP08) will operate without additional controls (i.e. they will not be enclosed).

A.1.3 Truck Dumping

Truck dumping (TRKD01 – TRKD02) only occurs at two areas of the site, where the raw materials are delivered onto the scrap stockpile, and the dumping of the output from the pre-shredder onto the inspected stockpile near the shredder.

The National Pollution Inventory (NPI) Manual for Mining (Department of Sustainability, Environment, Water, Population and Communities, 2012) provides an equation for the loading and unloading of trucks (rear dumping) that takes into account mean wind speed and moisture content of the product. This equation was used to estimate the emissions from the truck dumping processes.

Equation A.2 Emission Estimation for Loading and Unloading Trucks

$$EFTSP = KTSP \times 0.0016 \times \frac{(\frac{U}{2.2})^{1.3}}{(\frac{M}{2})^{1.4}}$$

Where:
EFTSP = emission factor for total suspended particles (kg/t)
$EFPM_{10}$ = emission factor for PM_{10} (kg/t)
KTSP = 0.74 for particles less than 30 micrometres in aerodynamic diameter
KPM_{10} = 0.35 for particles less than 10 micrometres in aerodynamic diameter
U = mean wind speed (m/s)
M = moisture content (% by weight)

The moisture content entered into this equation for the raw material was 5% (high moisture). Hourly wind speed was extracted at the site from the CALMET meteorological model. This allowed for an hourly changing wind speed to be included in the emission estimation. The wind speed (extracted at 10 m) was adjusted to the release height using *Equation A.3*.

Equation A.3 Wind Speed at Release Height

$$\frac{U}{Ur} = (\frac{Z}{Zr})^{a}$$

Where:
U = wind speed (m/s) at height Z
Ur = wind speed at reference height (10 m)
Zr = reference height (10 m)
a = an empirically derived coefficient that varies dependent upon the stability of the atmosphere

The resulting emission factor was fed into *Equation A.1* and applied to every hour the source is operational (6am-9pm for raw material delivery and 6am-8pm for post pre-shredder dumping). The throughput rates for the source TRKD01 (at the raw material delivery) was 1500 tonnes/day and 300 tonnes/day for TRKD02 (truck dumping pre-shredder output at the inspected stockpile).

Truck dumping will operate with water suppression controls, which will result in a 70% reduction in emissions.

A.1.4 Wind Erosion from Stockpiles and Exposed Conveyors

Wind erosion from material stockpiles (WE01 – WE06) and materials transported on exposed conveyors (CV01 – CV33) was estimated by using an equation from The National Pollution Inventory (NPI) Manual for Mining (Department of Sustainability, Environment, Water, Population and Communities, 2012). No mitigation has been assumed from wind erosion from the stockpiles or the exposed conveyors.

Equation A.4 Wind erosion from stockpiles and exposed conveyors

$$EFTSP = 1.9 \times (\frac{S}{1.5}) \times 365 \times (\frac{365 - p}{235}) \times (\frac{f}{15})$$

Where:
EFTSP = the emission factor of TSP (kg/ha/y)
S = silt content (5.3% by weight)
p = number of days per year when rainfall is greater than 0.25mm
f = percentage of time that wind speed is greater than 5.4 m/s at the mean height of the stockpile

A silt content of 5.3% was used, which corresponded to the silt content of slag from iron and steel production (AP-42, 2006). For each year assessed, the total TSP content was calculated using *Equation A.4.*

This total emission per year was divided between the number of hours where both the wind speed and rainfall conditions were met. This kg/ha/yr emission rate was converted to a g/sec emission rate using the area of the stockpiles and exposed conveyors.

A wind erosion based particulate matter size distribution between PM_{10} and PM_{30} factor of 0.5 was used to calculate the emission rate of PM_{10} for wind erosion (SKM, 2005).

A.1.5 Wet Scrubber Vent

<u>Air Species</u>

The wet scrubber vent (WSS01) has been modelled as a volume source, as the wet scrubber vent is located within an enclosure in the hammermill which is better represented as a volume source for the plume exiting the hammermill, rather than a point source.

The wet scrubber volume source has the following parameters:

- Release height = 10 m;
- Sigma-y = 0.47m;
- Sigma-z = 4.65m;
- Temperature = ambient temperature (taken for every hour of the year from the CALMET meteorological modelling); Maximum dust concentration from the vent = 20 mg/m^3; and
- Volumetric flow rate = 20,000 Nm^3/h.

The normalised volumetric flow was converted to ambient temperature (for every hour the source was operational) and multiplied by the mass flow rate of 20 mg/m^3. This was subsequently converted to a g/sec emission rate and applied to every hour the source is operational (6am-8pm).

In addition to the dominant air species emissions of particulates, the wet scrubber vent emits other toxic air pollutants (metals) at a much smaller rate associated with PM2.5 emissions. PM2.5 emissions were considered to be 32% of PM10 emissions in accordance with the speciation provided in AP42.

The typical list of metals emitted from a hammermill (as a mass percentage of $PM_{2.5}$) was obtained from the USEPA Speciate Data Browser (for Auto Body Shredding – Composite) (USEPA, 2009), for the following metals which have a corresponding assessment criteria (*Table 3.1*) under the Approved Methods:

- Chromium (assumed conservatively to Chromium VI) – 0.04% of $PM_{2.5}$;
- Copper – 0.1% of $PM_{2.5}$;
- Lead – 0.49% of $PM_{2.5}$;
- Manganese – 0.088% of $PM_{2.5}$; and
- Nickel – 0.031% of $PM_{2.5}$.

These percentages were applied to the maximum predicted concentrations at each sensitive receptor and across the grid for the relevant averaging periods.

Odour

The odour source strength from the wet scrubber vent of the hammer mill has been assessed during an odour source monitoring exercise, undertaken on 12 June, 2014 by EML Air Pty Ltd (test results are presented in Annex C).

Using a conservative approach, the maximum measured odour concentration (in units of odour unit (OU)/m^3) for the hammer mill of 1600 OU/m^3 has been used in the odour impact assessment. The wet scrubber plume velocity is 11.28 m/s. An electric fan and throttle valve are located within the stack close to the release point, which will disrupt the laminar flow of air from the stack. To account for this disturbance to the flow, the velocity of the stack flow has been reduced by 50%.With a stack velocity of 11.28 m/s, this provides an odour source strength of 4445.2 OU/s that has been used in the modelling.

A.1.6 Metals Cutting

Air Species

Metal cutting (C1 - C2) on site takes place at the scrap metal unloading area. Sell and Parker has reported that mild steel (about 20 mm thickness) is usually cut in wet and dry conditions, with typically 8 to 10 hours cutting per day. Metal cutting emissions are considered as fugitive emissions, but fugitive sources do not lend themselves easily to modelling, as a direct modelling configuration is not available. For sensitivity testing, metal cutting has been modelled as both point sources and volume sources, to assess which modelling configuration provides a more representative (and reasonable) simulation to represent these fugitive emission sources.

The National Pollutant Inventory (NPI) has been used as a reference source for establishing the types of emissions from metals cutting. The NPI Emission Estimation Technique Manual for Structural & Fabricated Metal Product

Manufacture[3] provided metals cutting emission factors. To facilitate emissions estimation as point sources, the following assumptions were made:

- there are no control equipment for cutting emissions;
- the NPI manual is limited only to emission factors for plasma cutting (with air as the plasma gas) for mild steel of 8 mm, and therefore the set of emission factors associated with this has been used;
- as a conservative approach, conventional cutting (dry cutting) is assumed as it provides the higher emission factors when compared to wet cutting;
- as a conservative approach, cutting takes place continuously through 10 hours in a day (starting 7 am, ending 5 pm);
- metals cutting has been observed on 12 June, 2014 (during the odour monitoring) to take place at two locations within that area, therefore two point sources have been assumed;
- metals cutting was observed to be undertaken at a ground/ low level on 12 June, and therefore as a default 1 m has been assumed;
- temperature has been assumed at 700 C, which is the approximate ignition temperature of steel[4];
- exit velocity from metals cutting emissions is not well defined in literature, as it depends on the operating conditions, materials and the environment of application, which may change depend on the scrap metal received. As a conservative measure, a nominally low exit velocity of 0.01 m/s for the emissions has been assumed; and
- exit diameter for metals cutting emission is also not well defined in literature. As a conservative measure, a nominally low exit diameter of 0.05 m has been assumed.

The emissions which have corresponding assessment criteria in *Table 3.1* are shown below:

- Nitrogen oxide (NO_X) = 0.33 g/s;
- Metal fumes (as iron oxide fumes, since iron is the main metal of steel) = 1.15 g/s;

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[3] http://www.npi.gov.au/resource/emission-estimation-technique-manual-structural-fabricated-metal-product-manufacture

[4] http://www.twi-global.com/technical-knowledge/job-knowledge/oxyfuel-cutting-process-and-fuel-gases-049/

- Manganese = 0.12 g/s; and

- Copper dusts and mists = 0.016 g/s.

For modelling as volume sources, the following parameters were assumed:

- Release height = 0.75 m (half the height of an average adult);

- Sigma-y = 0.23m; and

- Sigma-z = 0.70m.

The emissions rates are the same as those assumed for point sources.

<u>Odour</u>

The odour source strength from metal cutting has been assessed during the odour source monitoring exercise on 12 June, 2014.

Using a conservative approach, the maximum measured odour concentration (in units of odour unit (OU)/m^3) for metal cutting of 940 OU/m^3 has been used in the odour impact assessment. With an exit velocity of 0.01 m/s, this provides an odour source strength of 0.018 OU/s that has been used in the modelling for each point source.

Annex B

Figures

Figure B.1 *Maximum predicted (over 5 years) Site contribution to annual average TSP Concentrations (excluding background)*

Rev. N.	Date	Revision	Drawn by	Rev. by	Client: Sell and Parker	Highest (over five years) site contribution to annual mean TSP
0	26/02/14	Initial Issue	A. Radford	I. Cowan	Drawing No: Figure 1 TSP Annual.mxd	
1	11/12/14	Revised for inclusion of mitigation	I. Cowan		Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: AR Reviewed By: IC	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ
						Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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Figure B.2 Maximum predicted (over 5 years) Site contribution to annual mean Dust Deposition (excluding background)

Rev. N.	Date	Revision	Drawn by	Rev. by
0	26/02/14	Initial Issue	A. Radford	I. Cowan
1	11/12/14	Revised for inclusion of mitigation	I. Cowan	S. Lo

Client: Sell and Parker
Drawing No: Figure 7 Dust Deposition.mxd
Date: 11/12/2014 Drawing Size: A4
Drawn By: IC Reviewed By: SYL

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Highest (over five years) site contribution to monthly dust deposition expressed as

Waste Metal Recovery, Processing and Recycling Facility Expansion

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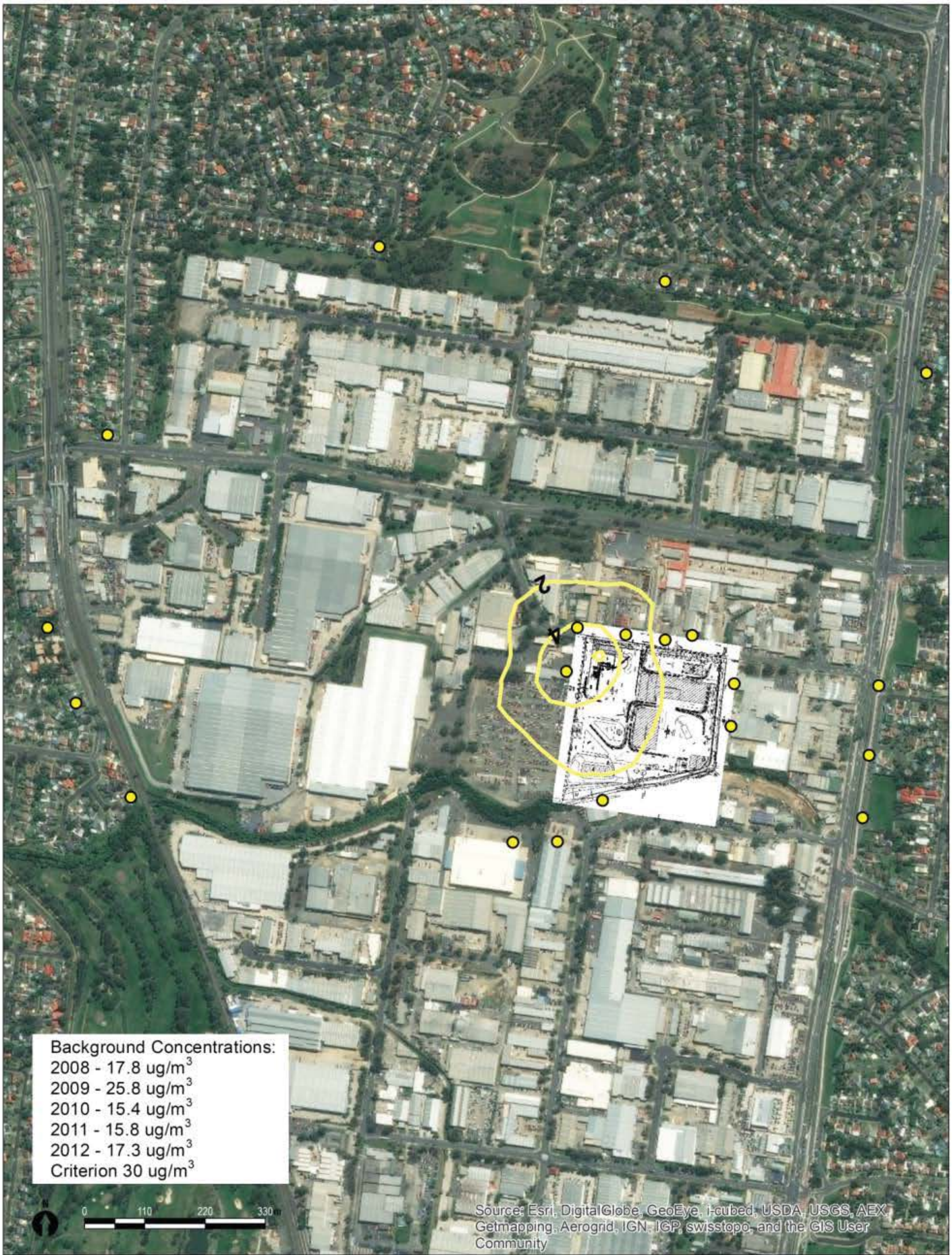
Figure B.3 Maximum predicted (over five years) Site contribution to annual average PM_{10} concentrations (excluding background)



Rev. N.	Date	Revision	Drawn by	Rev. by	Client:	Sell and Parker		Highest (over five years) site contribution to annual mean PM_{10}
0	26/02/14	Initial Issue	A. Radford	I. Cowan	Drawing No:	Figure 3 PM10 Annual.mxd		
1	11/12/14	Revised for inclusion of mitigation	I. Cowan	S. Lo	Date:	11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.			Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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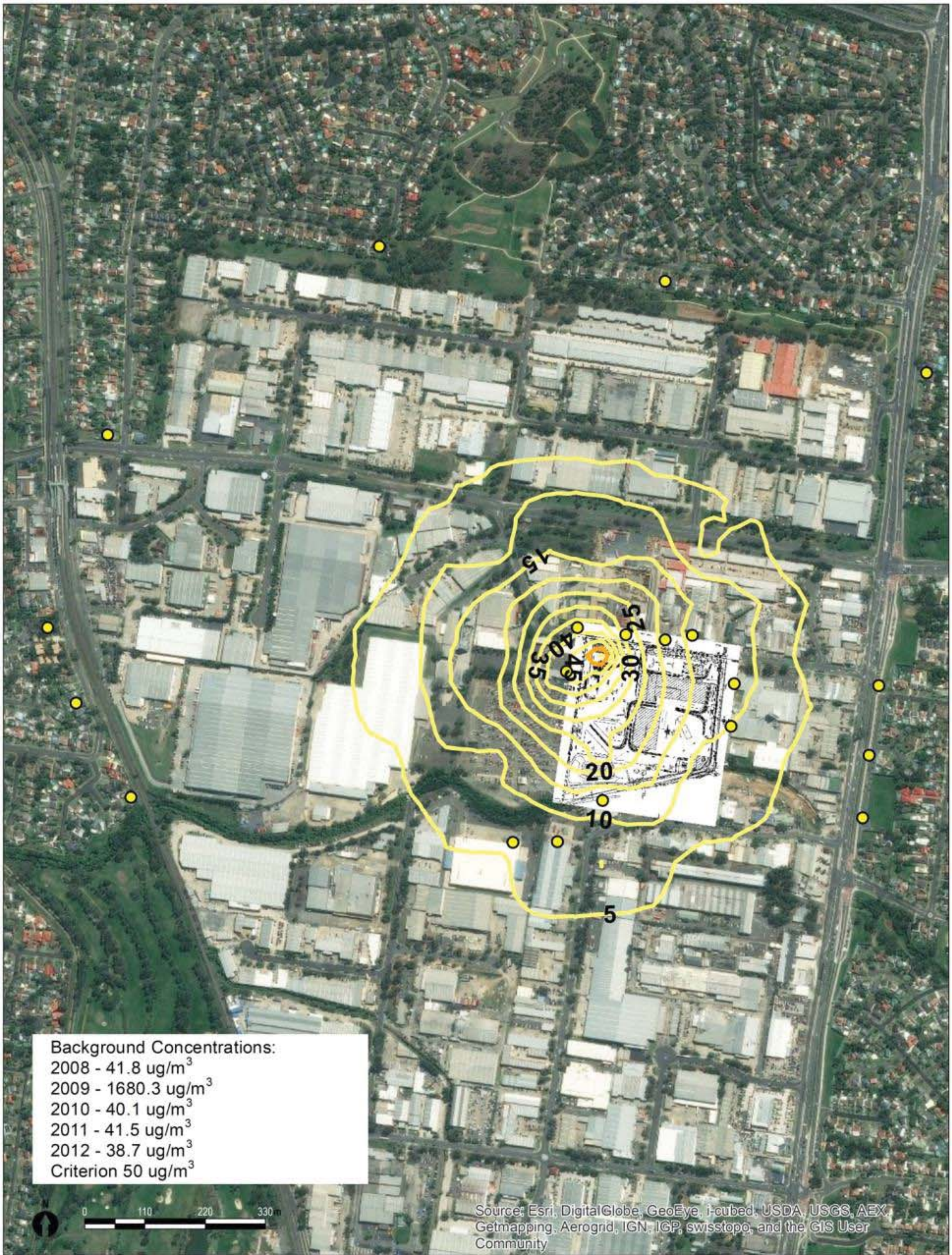
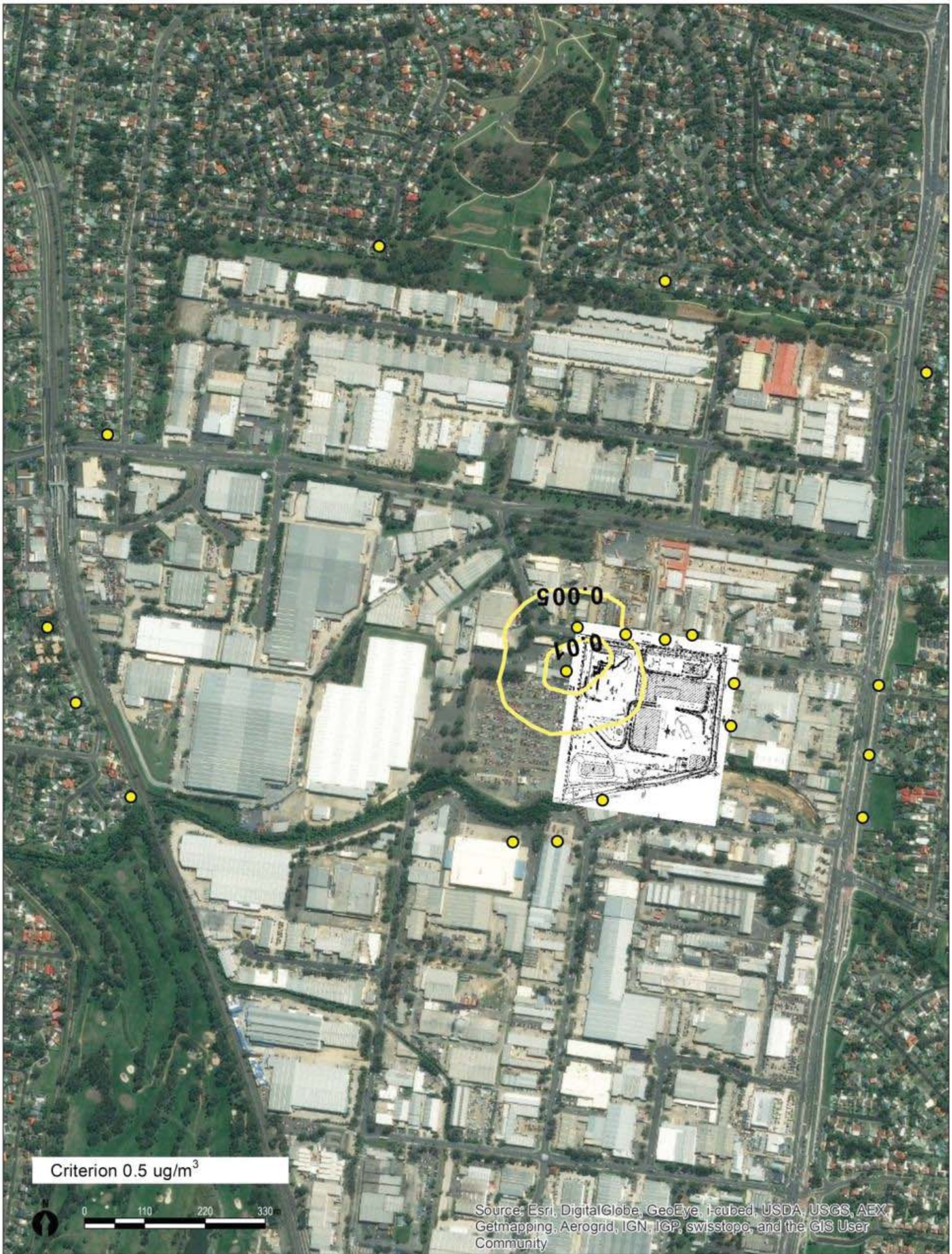
Figure B.4 Maximum predicted (over five years) Site contribution to 24-hour average PM_{10} concentrations (excluding background)



Rev. N.	Date	Revision	Drawn by	Rev. by			
0	26/02/14	Initial Issue	A. Radford	I. Cowan	Client: Sell and Parker Drawing No: Figure 2 PM10 24 Hour.mxd	Highest (over five years) site contribution to 24 hour average PM_{10}	ERM
1	11/12/14	Revised for inclusion of mitigation	I. Cowan	S. Lo	Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion	
					Drawn By: IC Reviewed By: SYL	Environmental Resources Management ANZ	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	

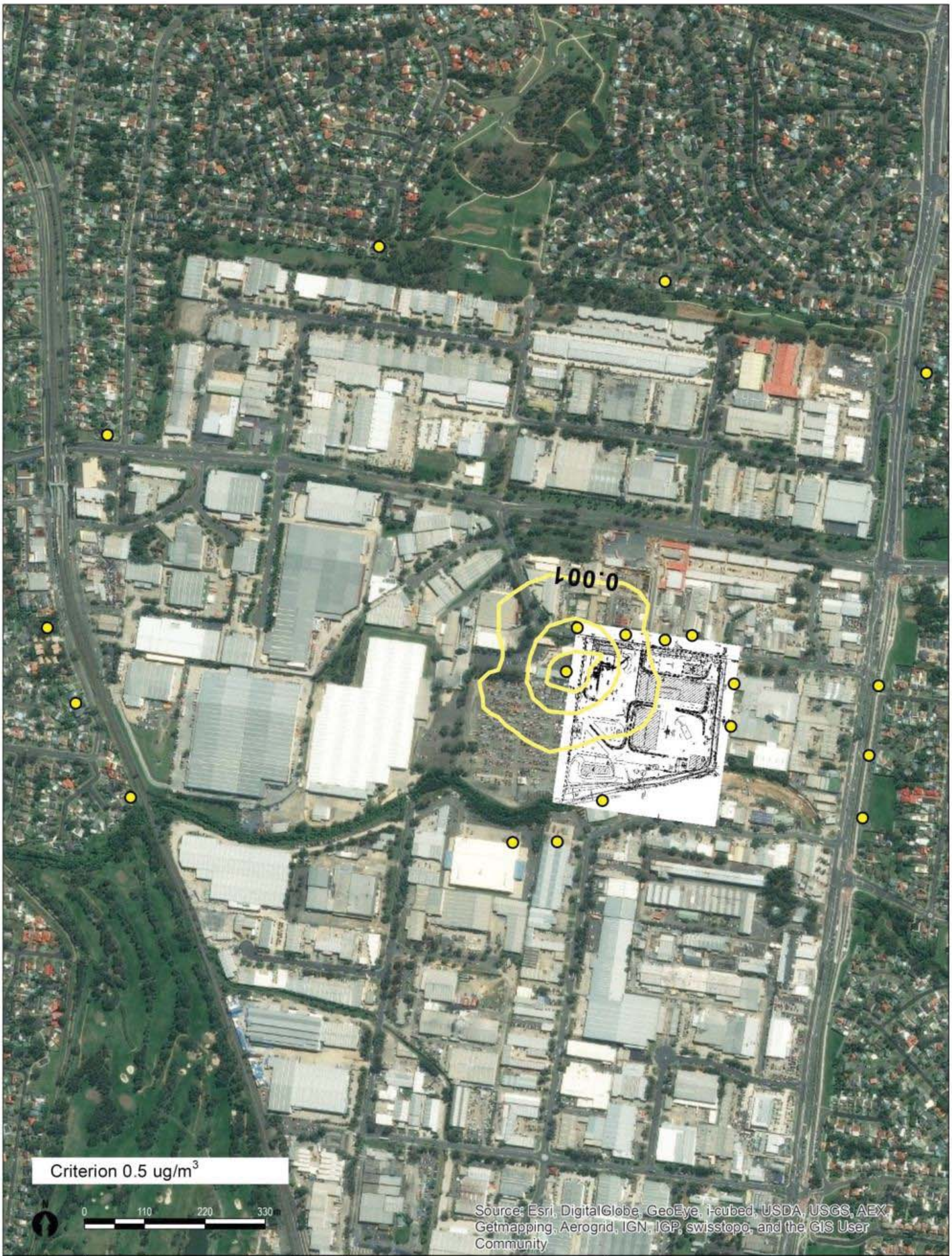
Figure B.5 Maximum (99.9th percentile) predicted (over five years) Site contribution to 1hour average chromium as chromium VI concentrations (excluding background)



Rev. N.	Date	Revision	Drawn by	Rev. by	Client: Sell and Parker	Highest (over five years) site contribution to 1 hour mean total chromium as
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Drawing No: Figure 4 Chromium.mxd	
					Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

ERM

Figure B.6 Maximum predicted (over five years) Site contribution to annual mean lead concentrations (excluding background)



Rev. N.	Date	Revision	Drawn by	Rev. by		
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker	**Highest (over five years) site contribution to annual mean lead**
					Drawing No: Figure 5 Lead.mxd	
					Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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Figure B.7 ***Maximum (99.9th percentile) predicted (over five years) Site contribution to 1hour average nickel concentrations (excluding background)***

Rev. N.	Date	Revision	Drawn by	Rev. by			
					Client:	Sell and Parker	**Highest (over five years) site contribution to 1 hour average nickel**
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Drawing No:	Figure 6 Nickel.mxd	
					Date:	11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.		Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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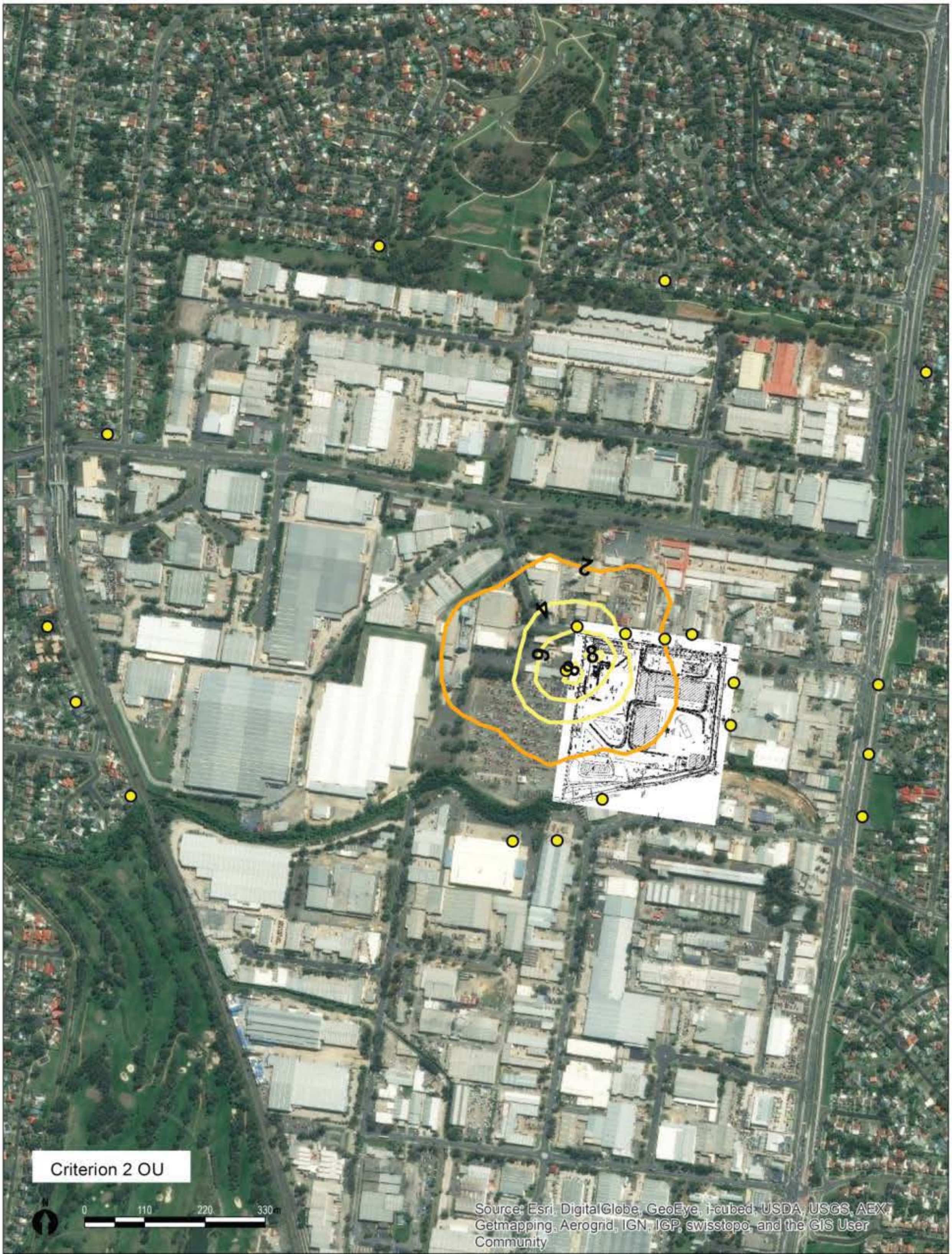
Figure B.8 *Maximum (99th Percentile) predicted (over five years) Site contribution to Peak odour concentrations (excluding background) with cutting modelled as volume sources*



Rev. N.	Date	Revision	Drawn by	Rev. by
0	11/12/14	Initial Issue	I. Cowan	S. Lo

Client: Sell and Parker
Drawing No: Figure 8 Odour Point.mxd
Date: 11/12/2014 Drawing Size: A4
Drawn By: IC Reviewed By: SYL

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Highest (over five years) site contribution to odour concentration for NRT, with cutting sources considered as volume sources

Waste Metal Recovery, Processing and Recycling Facility Expansion

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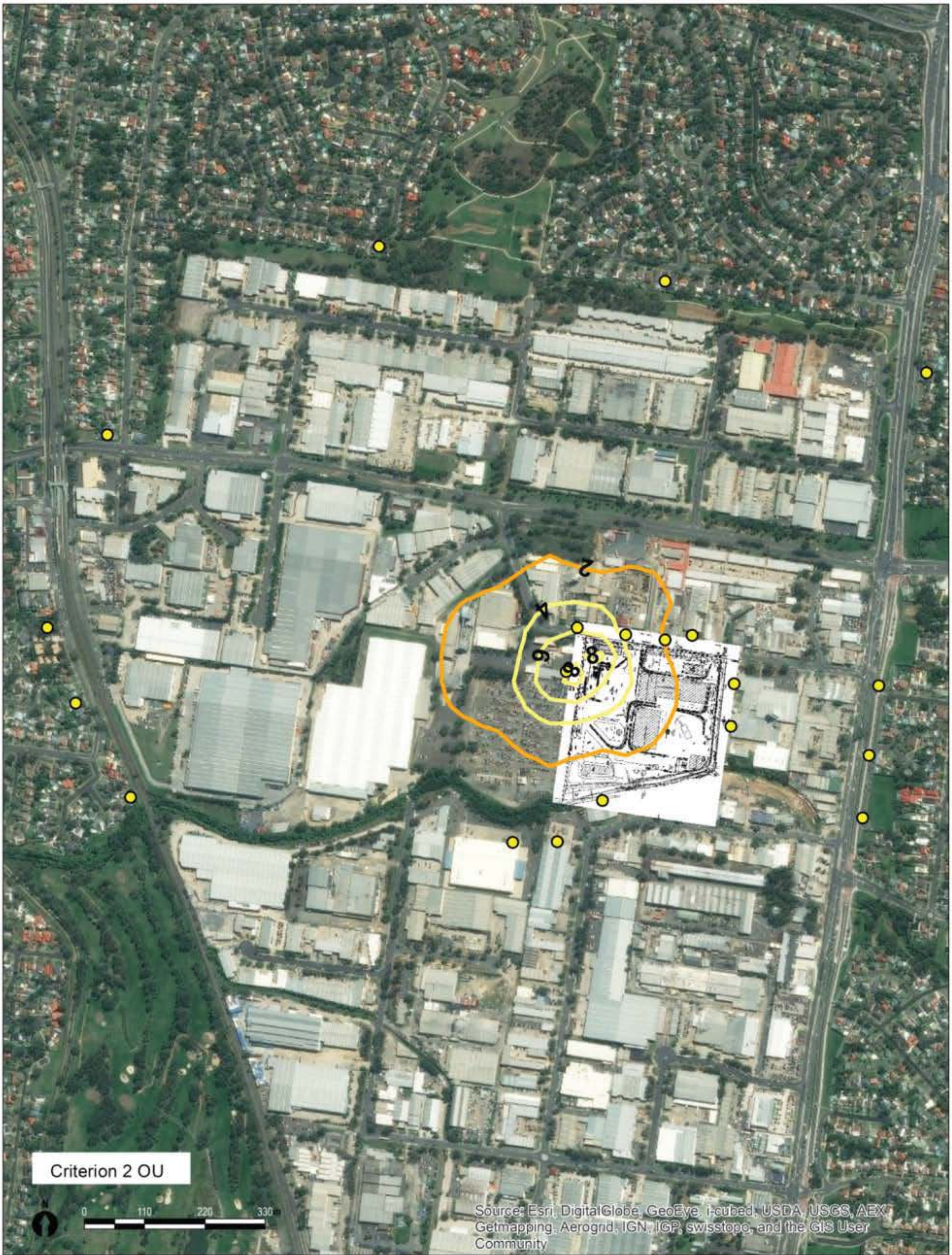
Figure B.9 Maximum (99th Percentile) predicted (over five years) Site contribution to Peak odour concentrations (excluding background) with cutting modelled as point sources



Rev. N.	Date	Revision	Drawn by	Rev. by	Client: Sell and Parker	Highest (over five years) site contribution to odour concentration for NRT, with cutting sources considered as point sources
0	26/02/14	Initial Issue	A. Radford	I. Cowan	Drawing No: Figure 8 Odour Point.mxd	
1	11/12/14	Revised to correct hammermill loc	I. Cowan	S. Lo	Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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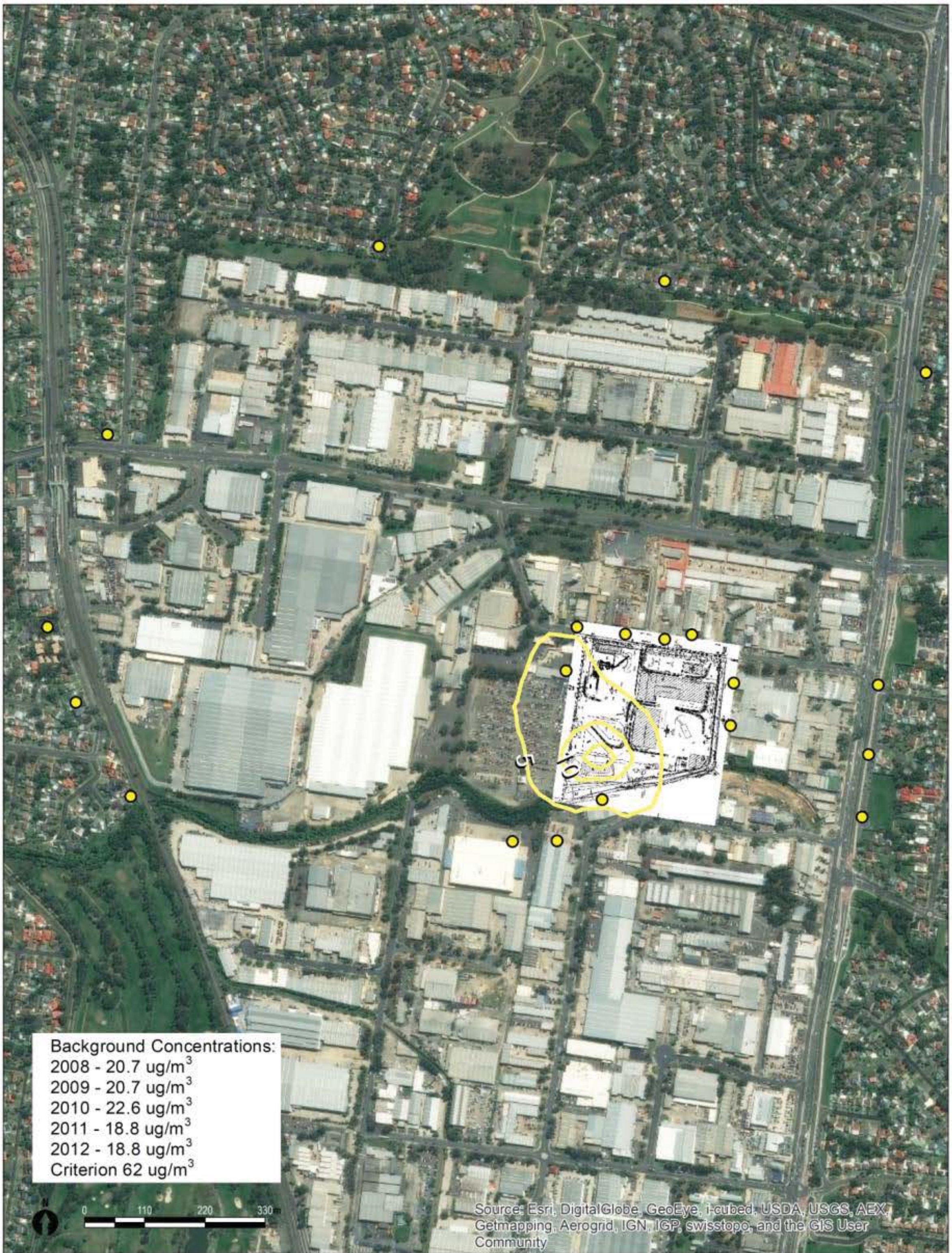
Figure B.10 Maximum predicted (over five years) Site contribution to annual average NO_2 concentrations (excluding background) with cutting modelled as volume sources



Rev. N.	Date	Revision	Drawn by	Rev. by				
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client:	Sell and Parker		Highest (over five years) site contribution to annual mean NO_2 concentrations, with cutting sources considered as Volume sources
					Drawing No:	Figure 14 NO2 Volume Annual.mxd		
					Date:	11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.			Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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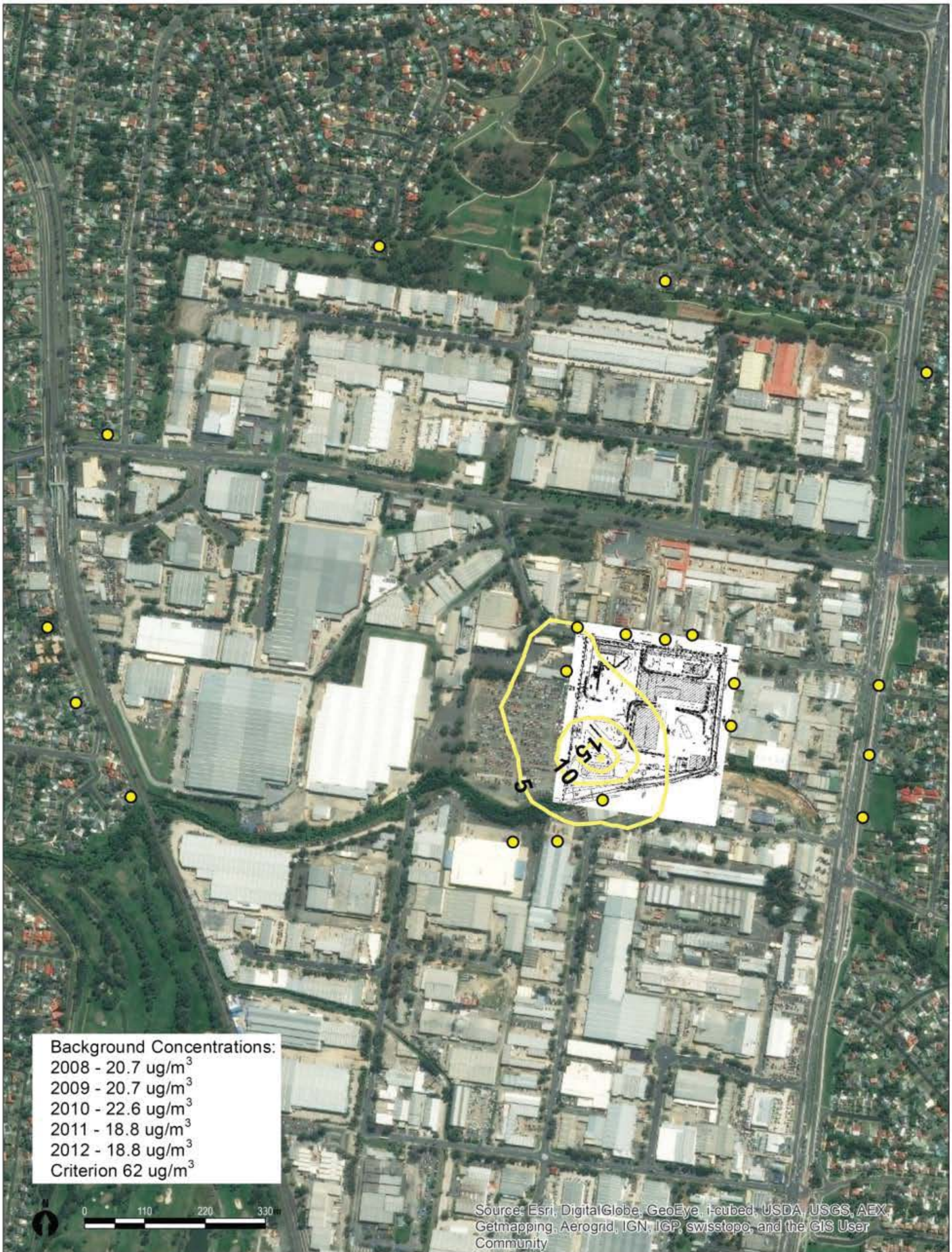
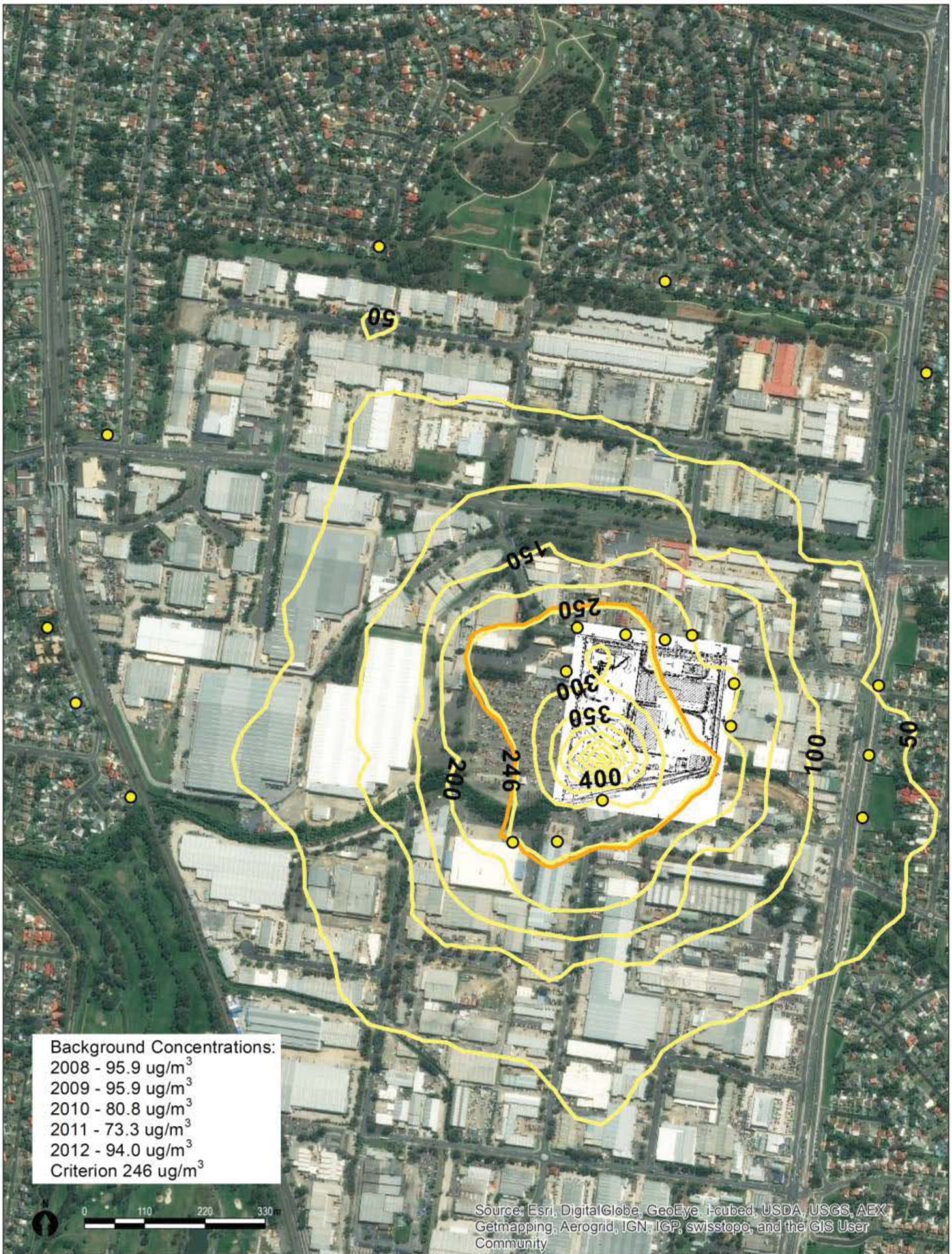
Figure B.11 Maximum predicted (over five years) Site contribution to annual average NO_2 concentrations (excluding background) with cutting modelled as point sources



Rev. N.	Date	Revision	Drawn by	Rev. by				
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client:	Sell and Parker		**Highest (over five years) site contribution to annual mean NO_2 concentrations, with cutting sources considered as Point sources**
					Drawing No:	Figure 13 NO2 Point Annual.mxd		
					Date:	11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.			Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

Figure B.12 ***Maximum predicted (over five years) Site contribution to hourly average NO_2 concentrations (excluding background) with cutting modelled as volume source***



Rev. N.	Date	Revision	Drawn by	Rev. by	Client: Sell and Parker		Highest (over five years) site contribution to 1 hour average NO_2 concentrations, with cutting sources considered as Volume sources
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Drawing No: Figure 11 NO2 Volume.mxd		
					Date: 11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.		Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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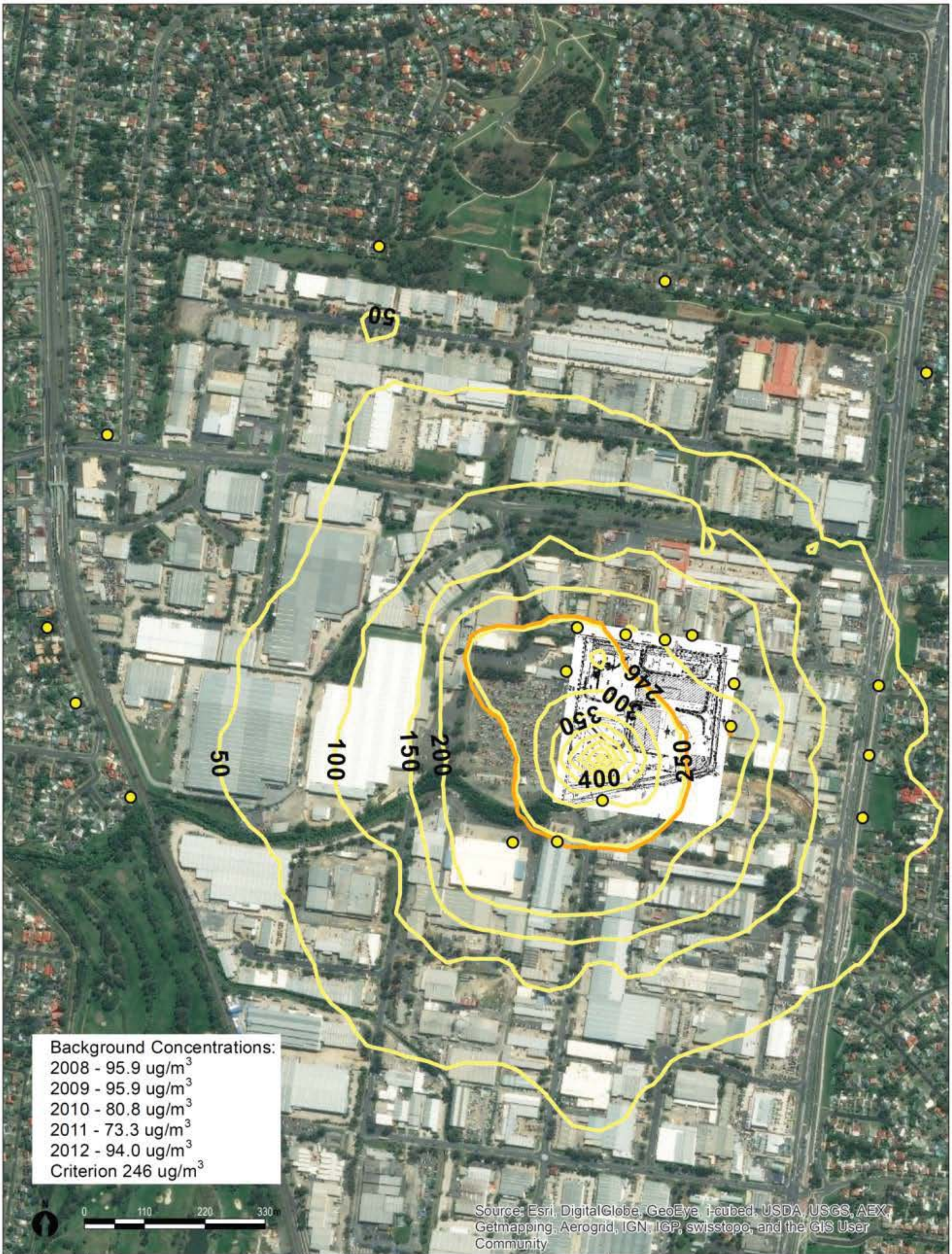
Figure B.13 Maximum predicted (over five years) Site contribution to hourly average NO_2 concentrations (excluding background) with cutting modelled as point source



Rev. N.	Date	Revision	Drawn by	Rev. by		
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker	Highest (over five years) site contribution to 1 hour average NO_2 concentrations, with cutting sources considered as Point sources
					Drawing No: Figure 9 NO2 Point.mxd	
					Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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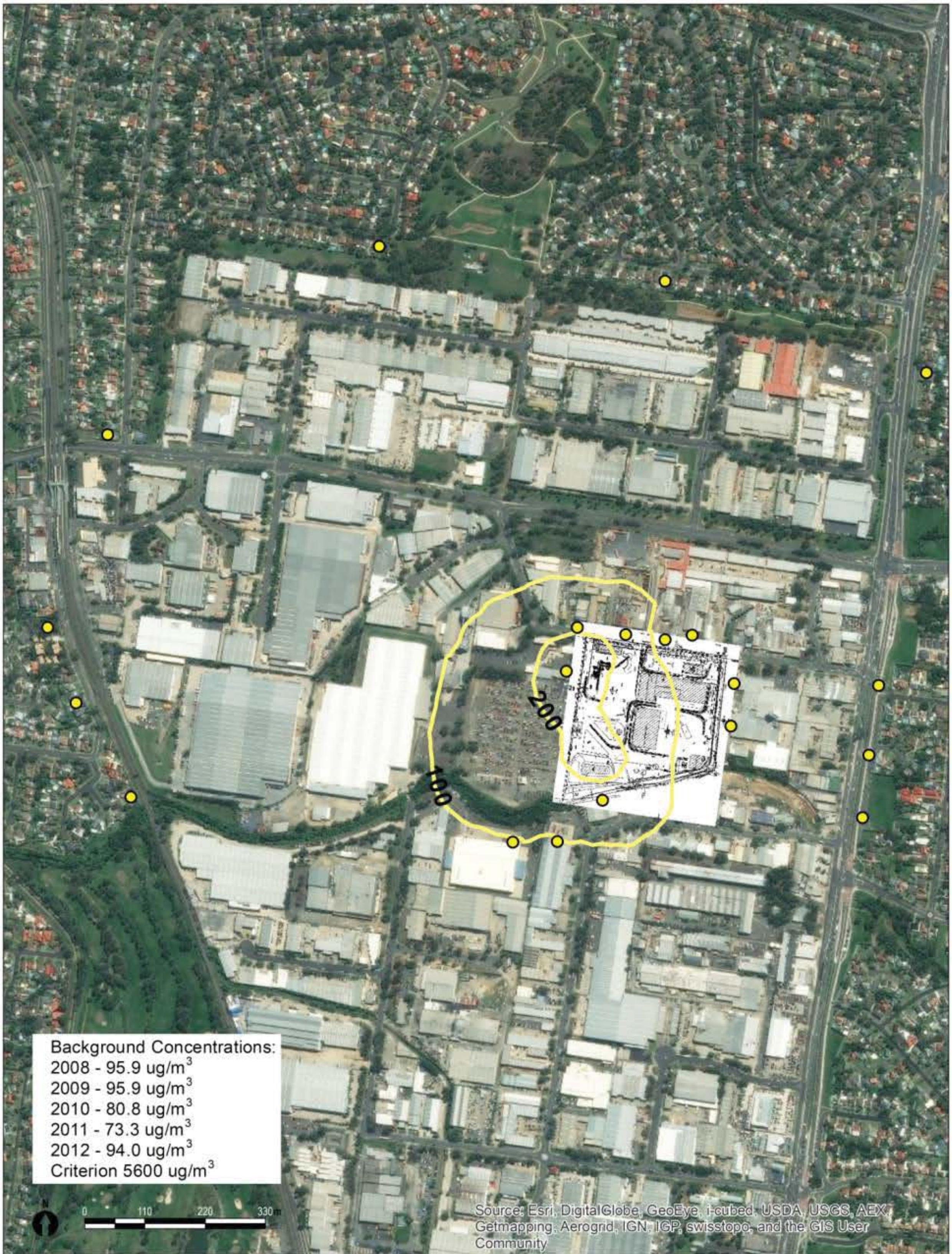
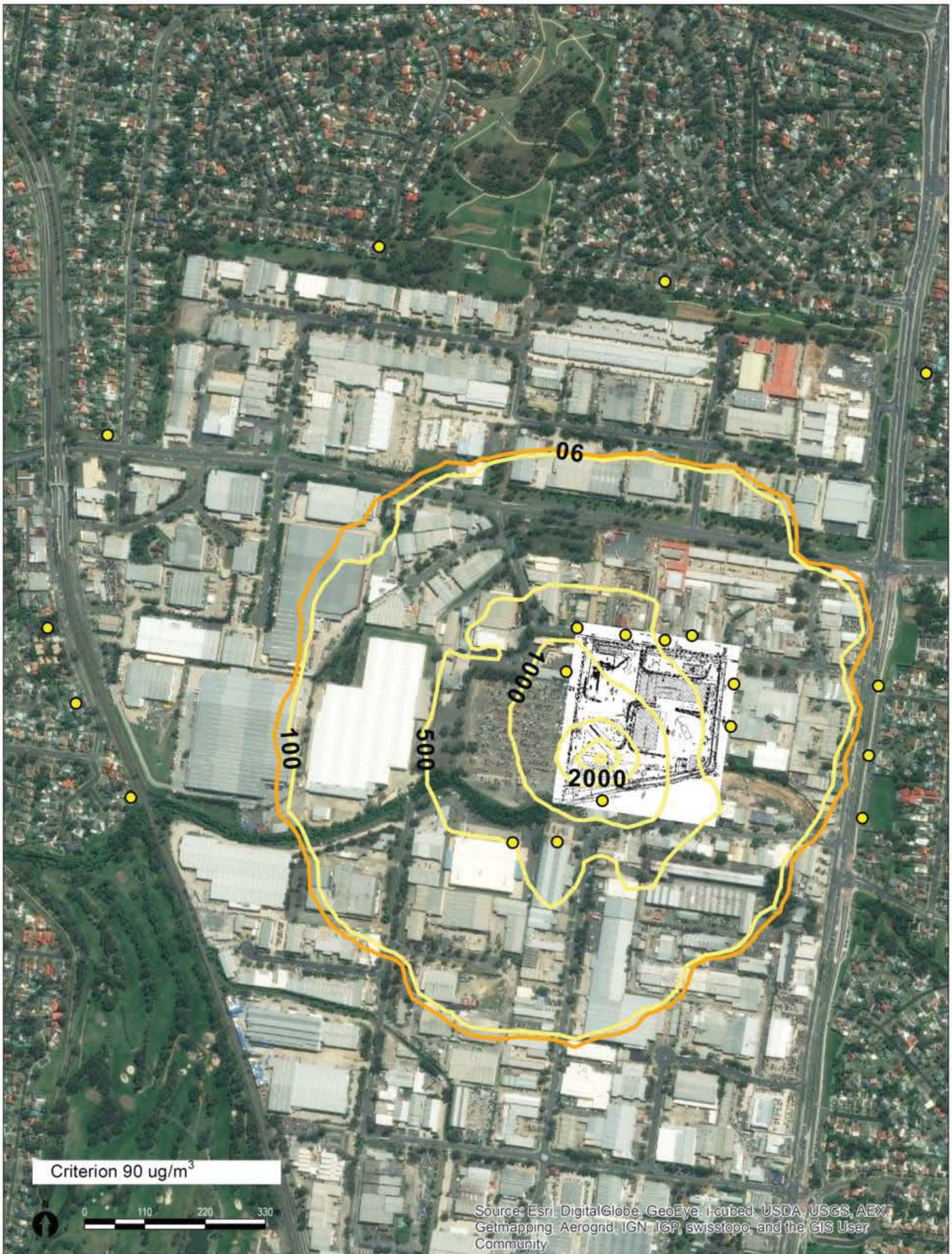
Figure B.14 Maximum predicted (over five years) Site contribution to 8-hour average (TWA) NO_2 concentrations (excluding background) with cutting modelled as point source



Rev. N.	Date	Revision	Drawn by	Rev. by		
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker	**Highest (over five years) site contribution to 8 hour average (TWA) NO_2 concentrations, with cutting sources considered as Point sources**
					Drawing No: Figure 12 NO2 Volume TWA.mxd	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Date: 11/12/2014 Drawing Size: A4	Environmental Resources Management ANZ
					Drawn By: IC Reviewed By: SYL	Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	ERM

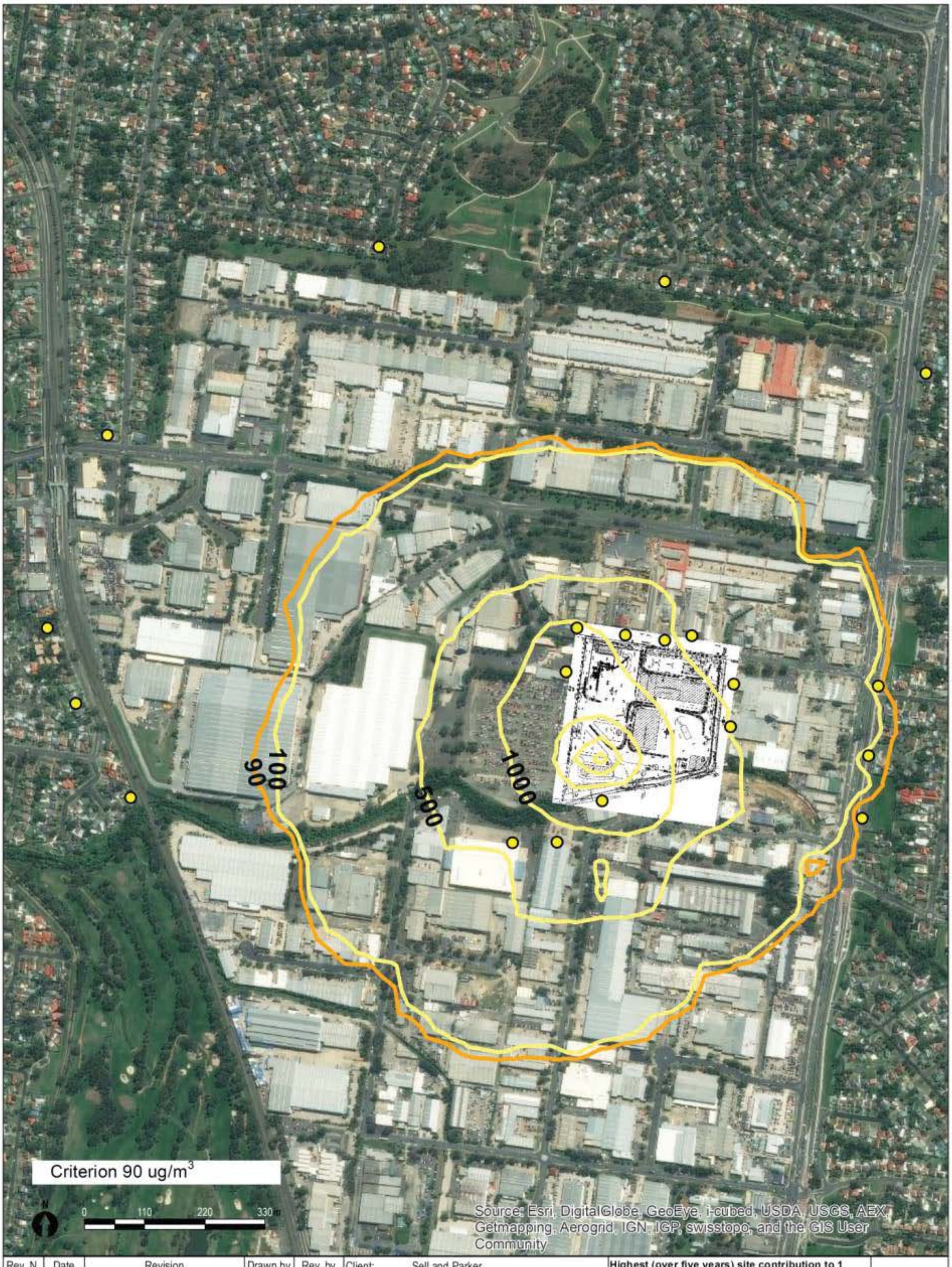
Figure B.15 *Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly iron oxide fumes concentrations (excluding background) with cutting modelled as volume sources*



Rev. N.	Date	Revision	Drawn by	Rev. by	Client:	Sell and Parker		Highest (over five years) site contribution to 1 hour average iron oxide fume concentrations, with cutting sources considered as Volume
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Drawing No:	Figure 16 FEO Volume.mxd		
					Date:	11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.			Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

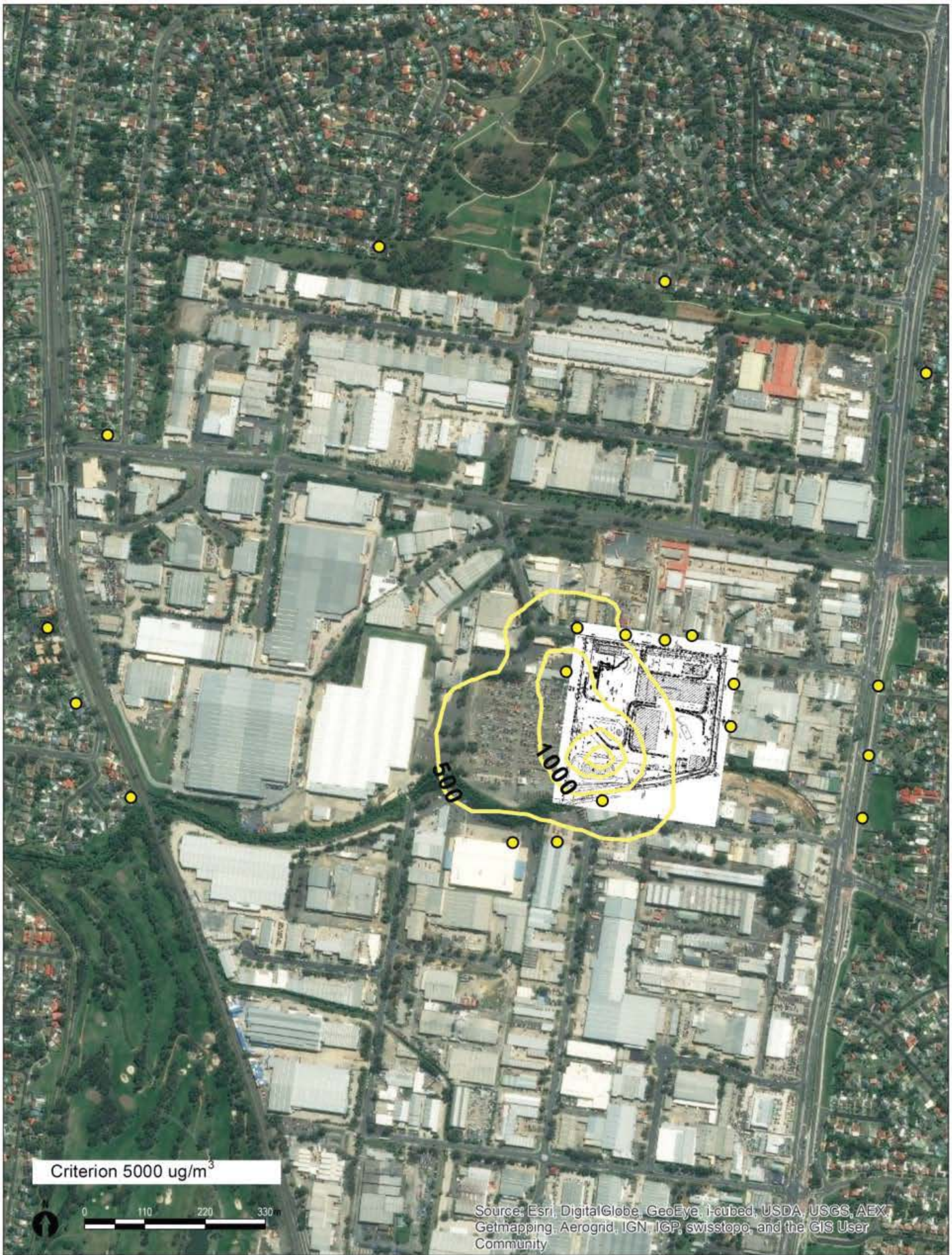
ERM

Figure B.16 ***Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly iron oxide fumes concentrations (excluding background) with cutting modelled as point sources***



Rev. N.	Date	Revision	Drawn by	Rev. by				
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client:	Sell and Parker		**Highest (over five years) site contribution to 1 hour average iron oxide fume concentrations, with cutting sources considered as Point sources**
					Drawing No:	Figure 15 FEO Point.mxd		
					Date:	11/12/2014	Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By:	IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.			Environmental Resources Management ANZ
								Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney
								ERM

Figure B.17 Maximum (99.9th percentile) predicted (over five years) Site contribution to 8-hour average (TWA) iron oxide fumes concentrations (excluding background) with cutting modelled as point sources



Rev. N.	Date	Revision	Drawn by	Rev. by			
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker		**Highest (over five years) site contribution to 8 hour average (TWA) iron oxide fume concentrations, with cutting sources considered**
					Drawing No: Figure 17 FEO Point TWA.mxd		Waste Metal Recovery, Processing and Recycling Facility Expansion
					Date: 11/12/2014	Drawing Size: A4	Environmental Resources Management ANZ
					Drawn By: IC	Reviewed By: SYL	Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.		ERM

Figure B.18 Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly manganese and compounds concentrations (excluding background) with cutting modelled as volume sources

Rev. N.	Date	Revision	Drawn by	Rev. by			
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker		**Highest (over five years) site contribution to 1 hour average manganese concentrations, with cutting sources considered as Volume sources**
					Drawing No: Figure 19 Mn Volume.mxd		Waste Metal Recovery, Processing and Recycling Facility Expansion
					Date: 11/12/2014	Drawing Size: A4	
					Drawn By: IC	Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.		Environmental Resources Management ANZ
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Figure B.19 Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly manganese and compounds concentrations (excluding background) with cutting modelled as point sources

Rev. N.	Date	Revision	Drawn by	Rev. by			
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker		**Highest (over five years) site contribution to 1 hour average manganese concentrations, with cutting sources considered as Point sources**
					Drawing No: Figure 18 Mn Point.mxd		Waste Metal Recovery, Processing and Recycling Facility Expansion
					Date: 11/12/2014	Drawing Size: A4	
					Drawn By: IC	Reviewed By: SYL	Environmental Resources Management ANZ
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.		Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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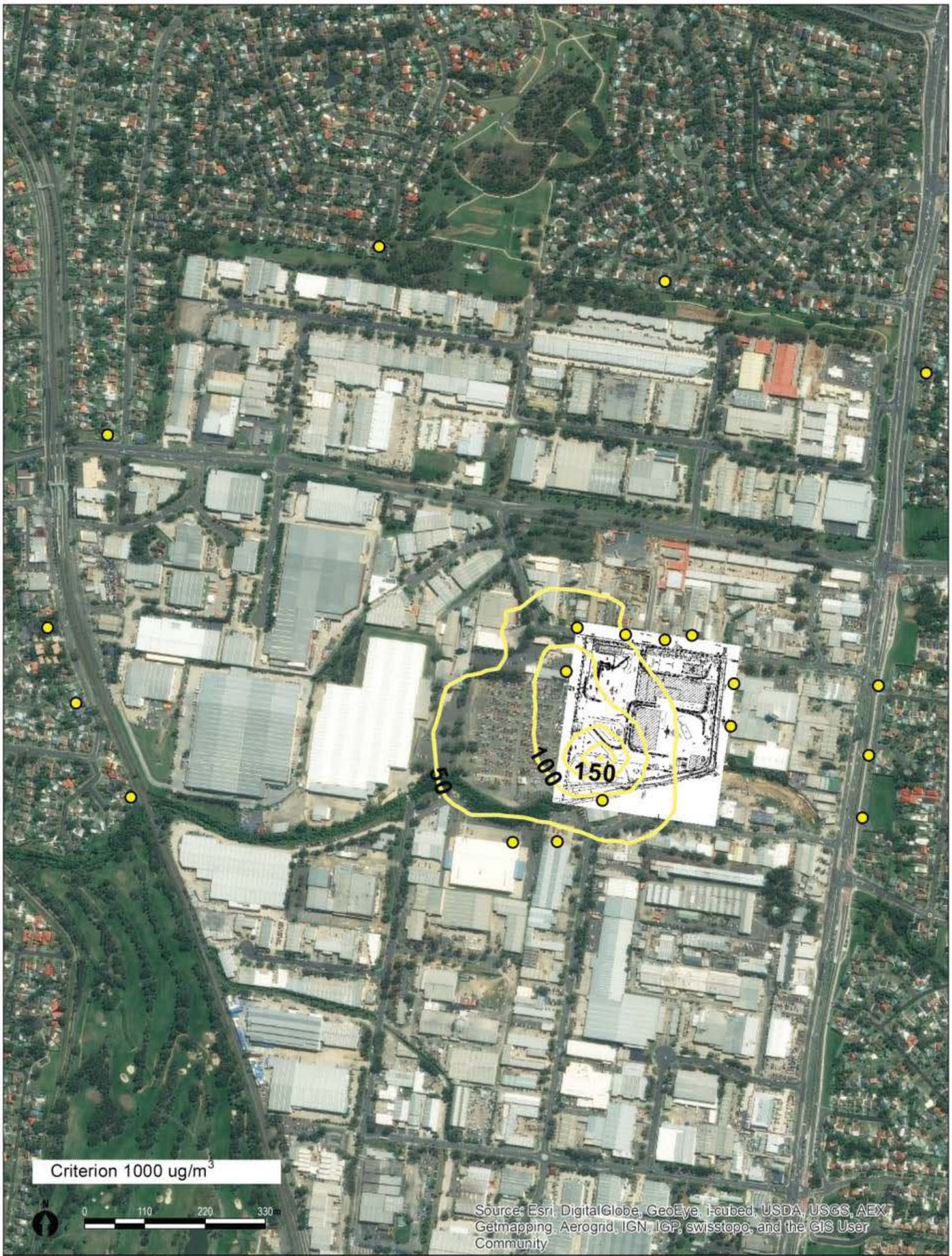
Figure B.20 ***Maximum (99.9th percentile) predicted (over five years) Site contribution to 8-hour average (TWA) manganese and compounds concentrations (excluding background) with cutting modelled as point sources***



Rev. N.	Date	Revision	Drawn by	Rev. by
0	11/12/14	Initial Issue	I. Cowan	S. Lo

Client: Sell and Parker
Drawing No: Figure 20 Mn Point TWA.mxd
Date: 11/12/2014 Drawing Size: A4
Drawn By: IC Reviewed By: SYL

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Highest (over five years) site contribution to 8 hour average (TWA) manganese concentrations, with cutting sources considered as Point sources

Waste Metal Recovery, Processing and Recycling Facility Expansion

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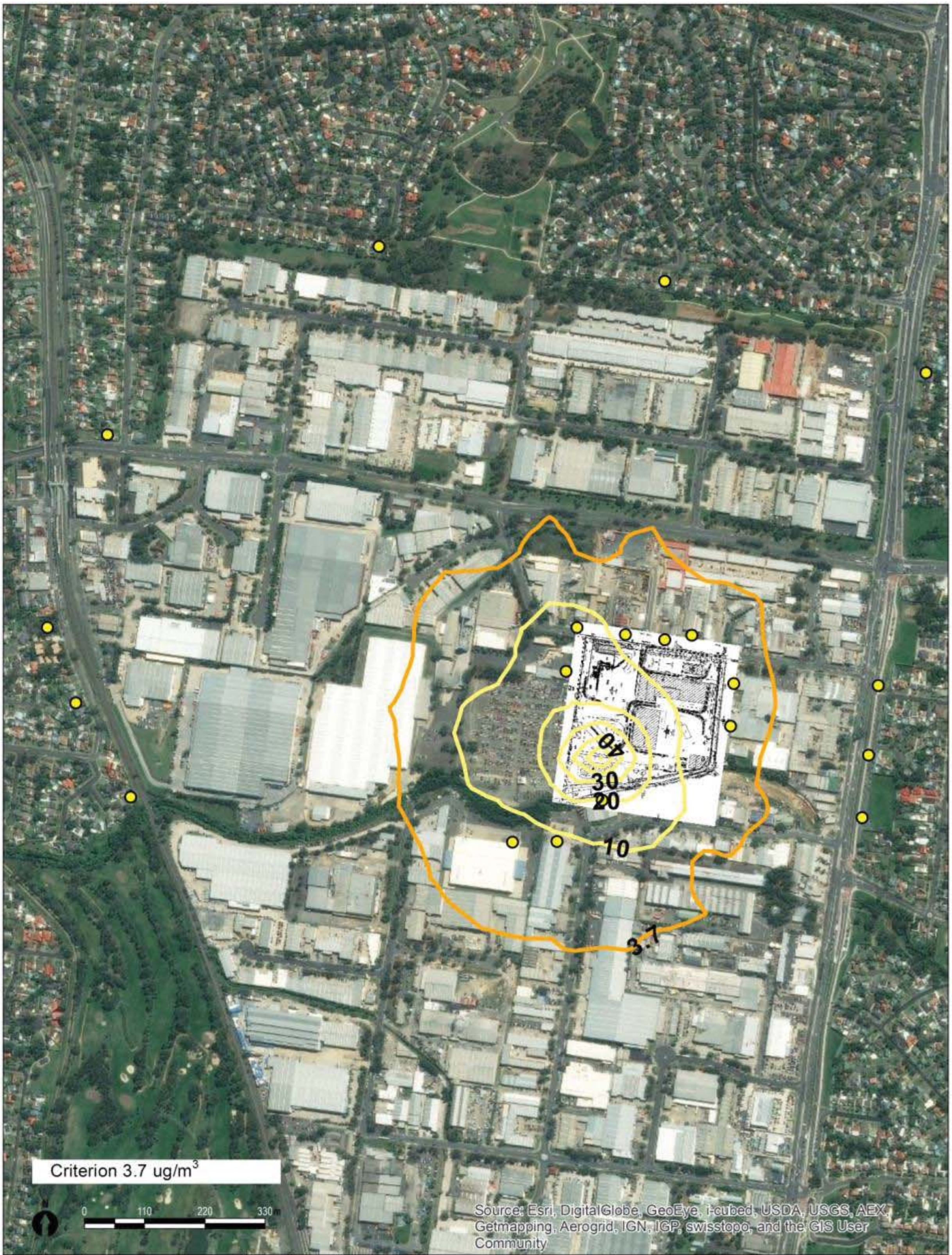
Figure B.21 ***Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly copper dusts and mists concentrations (excluding background) with cutting modelled as volume sources***



Rev. N.	Date	Revision	Drawn by	Rev. by		
0	11/12/14	Initial Issue	I. Cowan	S. Lo	Client: Sell and Parker	**Highest (over five years) site contribution to 1 hour average copper concentrations, with cutting sources considered as Volume sources**
					Drawing No: Figure 21 Cu Volume.mxd	
					Date: 11/12/2014 Drawing Size: A4	Waste Metal Recovery, Processing and Recycling Facility Expansion
					Drawn By: IC Reviewed By: SYL	
					This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	Environmental Resources Management ANZ
						Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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Figure B.22 Maximum (99.9th percentile) predicted (over five years) Site contribution to hourly copper dusts and mists concentrations (excluding background) with cutting modelled as point sources

Figure B.23 Maximum (99.9th percentile) predicted (over five years) Site contribution to 8-hour average (TWA) copper dusts and mists concentrations (excluding background) with cutting modelled as point sources

Rev. N.	Date	Revision	Drawn by	Rev. by
0	11/12/14	Initial Issue	I. Cowan	S. Lo

Client:	Sell and Parker
Drawing No:	Figure 23 Cu Point TWA.mxd
Date:	11/12/2014 — Drawing Size: A4
Drawn By:	IC — Reviewed By: SYL

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Highest (over five years) site contribution to 8 hour average (TWA) copper concentrations, with cutting sources considered as Point sources

Waste Metal Recovery, Processing and Recycling Facility Expansion

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Annex C

Odour Test Data

EMLAIR
Air Emission Testing

EML Air Pty Ltd
Report Number N92746

Emission Testing Report
ERM Australia Pty Ltd, Blacktown Plant

NATA

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Melissa Reddan BAppSc
Compliance Manager

Matthew Cook
Laboratory Manager

Document Information

Client Name: ERM Australia Pty Ltd

Report Number: N92746

Report Title: Emission Testing Report

Date of Issue: 18 June 2014

Attention: Dr Iain Cowan

Address: ERM Australia Pty Ltd
Level 3, Tower 3, World Trade Centre, 18-38 Siddeley Street
DOCKLANDS VIC 3005

Sampling Information

Sampling Date: June 2014

Sampling Team: DH

Report Status

Format	Document Number	Report Date	Prepared By	Reviewed By (1)	Reviewed By (2)
Preliminary Report	-	-	-	-	-
Draft Report	-	-	-	-	-
Final Report	N92746	18 June 2014	JW/AD	MR	MC
Amend Report	-	-	-	-	-

Internal Reference: ad doc:n92746.doc

Amendment Record

Document Number	Initiator	Report Date	Section	Reason
Nil	-	-	-	-

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List of Tables

Appendices

Nil

1 EXECUTIVE SUMMARY

Tests were performed at the request of ERM Australia Pty Ltd to determine emissions to air as detailed below;

Table 1: Testing Summary

Location	Test Date	Test Parameters*
Hammer Mill	12 June 2014	Odour and character
Oxy Cutting Area (up wind)	12 June 2014	Odour and character
Oxy Cutting Area (down wind)	12 June 2014	Odour and character

* Flow rate, velocity, temperature and moisture were determined unless otherwise stated.

2 RESULTS

Table 2: Hammer Mill - Test Results

Date	12/06/2014	**Client**	Sell & Parker - (ERM Australia)		
Report	N92746	**Stack ID**	Hammer Mill		
Licence No.	-	**Location**	Blacktown	**State**	NSW
EML Staff	DH/ZP				
Process Conditions	Please refer to client records.				
Reason for testing:	Client requested testing to determine emissions to air				

Odour		Average	Test 1		Test 2	
Sampling date & Time			12/06/14	1102	12/06/14	1128
Analysis date & Time			13/06/14	1438	13/06/14	1444
Holding time				27 hours		27 hours
Dilution factor & Threshold			1	1000 ou	1	1600 ou
Butanol threshold	29 ppb					
Laboratory temp	20 °C		Concentration		Concentration	
Last calibrated	10/01/14	ou	ou		ou	
No. ITE's used			12		12	
Concentration		1300	1000		1600	
Lower Uncertainty Limit		900	470		750	
Upper Uncertainty Limit		2000	2200		3500	
Hedonic tone			Mildly Unpleasant/Distinct		Mildly Unpleasant/Distinct	
Odour character			Acidic		Acid	

Table 3: Oxy Cutting Area (Up Windl - Test Results

Date	12/06/2014	**Client**	Sell & Parker - (ERM Australia)		
Report	N92746	**Stack ID**	Oxy Cutting Area (Upwind)		
Licence No.	-	**Location**	Blacktown	**State**	NSW
EML Staff	DH/ZP				
Process Conditions	Please refer to client records.				
Reason for testing:	Client requested testing to determine emissions to air				

Odour		Average	Test 1		Test 2	
Sampling date & Time			12/06/14	1248	12/06/14	1322
Analysis date & Time			13/06/14	1451	13/06/14	1500
Holding time				26 hours		26 hours
Dilution factor & Threshold			1	940 ou	1	650 ou
Butanol threshold	29 ppb					
Laboratory temp	20 °C		Concentration		Concentration	
Last calibrated	10/01/14	ou	ou		ou	
No. ITE's used			8		12	
Concentration		790	940		650	
Lower Uncertainty Limit		540	430		300	
Upper Uncertainty Limit		1200	2000		1400	
Hedonic tone			Mildly Unpleasant/Distinct		Mildly Unpleasant	
Odour character			Metal		Metal	

Table 4: Oxy Cutting Area (Down Windl - Test Results

Date	12/06/2014	**Client**	Sell & Parker - (ERM Australia)		
Report	N92746	**Stack ID**	Oxy Cutting Area (Downwind)		
Licence No.	-	**Location**	Blacktown	**State**	NSW
EML Staff	DH/ZP				
Process Conditions	Please refer to client records.				
Reason for testing:	Client requested testing to determine emissions to air				

Odour		Average	Test 1		Test 2	
Sampling date & Time			12/06/14	1248	12/06/14	1322
Analysis date & Time			13/06/14	1421	13/06/14	1431
Holding time				26 hours		25 hours
Dilution factor & Threshold			1	540 ou	1	550 ou
Butanol threshold	29 ppb					
Laboratory temp	20 °C		Concentration		Concentration	
Last calibrated	10/01/14	ou	ou		ou	
No. ITE's used			12		10	
Concentration		550	540		550	
Lower Uncertainty Limit		370	250		250	
Upper Uncertainty Limit		800	1200		1200	
Hedonic tone			Mildly Unpleasant/Distinct		Mildly Unpleasant/Distinct	
Odour character			Smokey, Metal		Smokey,Metal	

3 PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See ERM Australia Pty Ltd's records for complete process conditions.

4 TEST METHODS

Unless otherwise stated, the following methods meet the requirements of the NSW Office of Environment and Heritage (as specified in the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007). All sampling and analysis was performed by EML Air unless otherwise specified. Specific details of the methods are available upon request.

Table 5: Test Method Table

Parameter	Test Method	Method Detection Limit	Uncertainty*	NATA Accredited	
				Sampling	Analysis
Sample Plane Criteria	NSW TM-1	NA	-	✓	NA
Velocity	NSW TM-2	$2ms^{-1}$	7%	✓	NA
Temperature	NSW TM-2	0°C	2%	✓	NA
Flow rate	NSW TM-2	Location specific	8%	✓	NA
Moisture content	NSW TM-22	0.4%	8%	✓	✓
Odour	NSW OM-7	16ou	not specified	✓	✓

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

5 QUALITY ASSURANCE/ QUALITY CONTROL INFORMATION

EML Air Pty Ltd is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources (Accreditation number 2732). Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for EML Air at NATA's website www.nata.asn.au.

EML Air Pty Ltd is accredited by NATA (National Association of Testing Authorities) to Australian Standard 17025 – General Requirements for the Competence of Testing and Calibration Laboratories. Australian Standard 17025 requires that a laboratory have a quality system similar to ISO 9002. More importantly it also requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Assurance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world –wide.

A formal Quality Control program is in place at EML Air to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

6 DEFINITIONS

The following symbols and abbreviations may be used in this test report:

NTP	Normal temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
$PM_{2.5}$	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM_{10}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D_{50}	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency ie. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. The D_{50} method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D_{50} of that cyclone and less than the D_{50} of the preceding cyclone.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
~	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DEC	Department of Environment & Conservation (WA)
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
CTM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry

Annex D

Sensitivity Analysis of Metals Cutting as a Volume Source and as a Point Source

D.1 SENSITIVITY ANALYSIS

Due to the non-typical nature of fugitive emissions, ERM has undertaken a sensitivity analysis of modelling metal cutting emissions as both a point source and as a volume source.

One of the main features between modelling metal cutting as a point source and as a volume source is that as a point source, CALPUFF allows a consideration of the cutting temperature in the model; the plume thereby will travel further away from the cutting source, compared to a volume source modelling configuration which does not allow consideration of temperature. As such, a volume source is generally expected to present a more localised peak of ground level concentrations.

For the sensitivity analysis, NO_X (as NO_2) and iron oxide fume emissions, which are both emissions unique to metal cutting, have been used.

D.1.1 *Odour*

Using odour emissions of metals cutting as an example, a comparison of the peak modelling results (99th percentile) at sensitive receptors is shown in *Table D.1* for point and volume sources.

Table D.1 Odour Peak Modelling Results from Metals Cutting as a Point Source and as a Volume Source

Receptor #	Odour peak modelling results as a point source (μg/m³)	Odour peak modelling results as a volume source (μg/m³)	Point source value or volume source value larger?
R1	0.20	0.20	Similar
R2	0.17	0.17	Similar
R3	0.14	0.14	Similar
R4	0.11	0.11	Similar
R5	0.09	0.09	Similar
R6	0.07	0.07	Similar
R7	0.07	0.07	Similar
R8	0.08	0.08	Similar
R9	0.08	0.08	Similar
R10	0.06	0.06	Similar
R11	0.05	0.05	Similar
R12	3.00	3.00	Similar
R13	1.69	1.69	Similar
R14	1.11	1.11	Similar
R15	1.34	1.34	Similar
R16	0.83	0.83	Similar
R17	0.90	0.90	Similar
R18	0.62	0.62	Similar
R19	0.62	0.62	Similar
R20	9.40	9.40	Similar

It can be seen from *Table D1.1* that for peak odour, there is no difference between modelling cutting emissions as a point source or as a volume source. This is because odour emissions from the hammer mill dominate ground level concentrations of odour at sensitive receptors surrounding the Site.

D.1.2 NO_2

Using NO_2 emissions of metals cutting as an example, a comparison of the hourly modelling results (100th percentile, inclusive of background concentrations) at sensitive receptors is shown in *Table D.2* for point and volume sources.

Table D.2 NO_2 Hourly Modelling Results from Metals Cutting as a Point Source and as a Volume Source

Receptor #	NO_2 hourly modelling results as a point source (µg/m³)	NO_2 hourly modelling results as a volume source (µg/m³)	Point source value or volume source value larger?
R1	132.45	114.24	Point
R2	147.81	147.87	Similar
R3	151.98	152.01	Similar
R4	128.57	128.56	Similar
R5	129.70	129.73	Similar
R6	112.38	112.35	Similar
R7	87.28	87.28	Similar
R8	132.07	132.09	Similar
R9	125.87	121.63	Point
R10	89.56	89.56	Similar
R11	103.40	86.56	Point
R12	289.97	345.36	Volume
R13	289.84	345.10	Volume
R14	276.28	275.62	Similar
R15	266.73	280.90	Volume
R16	323.56	265.05	Point
R17	348.22	347.88	Similar
R18	341.22	340.49	Similar
R19	333.94	337.36	Point
R20	381.08	381.35	Similar

that at further distance away from the Site (i.e. R1 to R10) at 100th percentile, the difference between modelling as a point source and as a volume source is negligible in most cases. The difference, however, is more pronounced in nearer field instances (i.e. R11 to R20), which corresponds to the expectation that a volume source is generally expected to present a more localised peak of ground level concentrations as no temperature is taken into consideration in the modelling.

In conclusion, to present a conservative scenario, for NO_2 emissions, metal cutting is considered as a volume source and the assessment results for 100th percentile will be based on this modelling configuration.

D.1.3 Iron Oxide Fumes

Using iron oxide fumes as an example, a comparison of the hourly modelling results (excluding background as none was available; 99.9th percentile) of metals cutting at sensitive receptors is shown in *Table D.3* for point and volume sources.

Table D.3 Iron Oxide Fumes Hourly Modelling Results of Metals Cutting as a Point Source and as a Volume Source

Receptor #	Iron oxide fumes hourly modelling results as a point source (µg/m³)	Iron oxide fumes hourly modelling results as a volume source (µg/m³)	Point source value or volume source value larger?
R1	87.01	63.62	Point
R2	90.86	69.84	Point
R3	79.65	56.71	Point
R4	48.60	43.84	Point
R5	39.57	32.05	Point
R6	28.71	28.70	Similar
R7	29.25	22.74	Point
R8	26.60	26.41	Similar
R9	28.29	24.89	Point
R10	25.73	21.17	Point
R11	1034.14	813.60	Point
R12	982.74	779.87	Point
R13	753.97	626.22	Point
R14	449.86	380.81	Point
R15	497.18	420.50	Point
R16	613.25	480.59	Point
R17	1937.21	1871.94	Point
R18	929.29	867.67	Point
R19	742.13	685.60	Point
R20	1293.46	1087.97	Point

It can be seen from *Table D.2* that irrespective of distance at 99.9th percentile, modelling metal (iron oxide fumes) emissions as a point source provides a more conservative modelling scenario.

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Annex E

REVISED ENVIRONMENTAL RISK ASSESSMENT

Table E.1 Revised Environmental Risk Assessment

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
Ecology	Impact / disturbance to downstream ecosystems from discharges from site	C	3	M	Sediment control barriers installed at the site during construction and while earthworks are undertaken. All vehicles are to keep to the existing and proposed access roads on-site.	E	5	L
	Minor, localised alteration to vegetation on-site. Potential to spread noxious weeds	C	3	M	All undertaken in accordance with the *Noxious Weeds Act 1993* and the *Noxious and environmental weed control handbook - A guide to weed control in non-crop, aquatic and bushland situations*	E	4	L
Heritage	Unexpected heritage item uncovered during construction.	C	2	H	All staff, contractors and others involved in the construction works made aware of the statutory legislation protecting sites and places of heritage significance. In the event that a site or artefact (as defined by the *National Parks and Wildlife Act 1974* or *Heritage Act 1977* is identified during construction works, works shall cease at the location. The find shall be immediately reported to the regulator in accordance with legislation. No work shall commence	E	5	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
					until any required approvals have been given.			
Acoustics	Noise and vibration Impact assessment has indicated that noise emissions to residential premises were predicted to comply with the project-specific noise levels without noise mitigation measures.	E	5	L	No additional mitigation measures required.	E	5	L
	Minor noise and vibration emissions from site operations to neighbouring existing and proposed new industrial premises	C	3	M	The following acoustic screen fencing is proposed to mitigate noise emissions from site operations to neighbouring existing and proposed new industrial premises: • retain the existing acoustic screen fencing at a height of 4m, which is currently erected around the existing site northern and western boundary and along existing driveways as shown on the site drawings; and • proposed new colorbond and electric fence along the new eastern boundary shall be an acoustic screen fencing of 4m height	E	5	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigatio n
	Noise and vibration impact assessment has shown potential traffic noise associated with the operation of the facility and impacting nearby residential receivers is assessed as being insignificant and would comply with the RNP.	E	5	L	No additional mitigation measures required.	E	5	L
Air Quality	Air quality impact assessment has shown no additional exceedance of criteria due to the proposed development.	E	5	L	Although no additional exceedance are expected, a number of mitigation measures will be employed, including dust suppression where required and maintenance of vehicles and equipment in accordance with manufacturer's specifications.	E	5	L
Greenhouse Gas	The contribution of the emissions to the totals for NSW and the nation, the upgrade represents a negligible increase in GHG emissions.	B	4	M	The upgrade of the site will result in a number of efficiency improvements which will reduce the emission of GHGs from the mobile materials handling equipment kilometres travelled by trucks. The increased throughput will also allow for efficiencies due to the economy of scale;	E	4	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	Post-upgrade the site has an additional capacity to recover ferrous and non-ferrous materials from the recycling processes, decreasing the need for end users to source raw materials from the extraction industries	A	4		Improvement - no mitigation measure required.	A	4	
Soil and Water	Expansion of site operations will create increased demand for water supply.	B	3	H	From the preliminary calculations provided in the soil and water assessment it assumed that between 15% and 35% of the total water requirement on-site could potentially be supplied by the stormwater basin in dry years (10%ile rain year) and wet years (90%ile rain year) respectively with an average rainfall year potentially supplying 26% of the site water requirements. Rainwater tanks would likely be best suited to providing water for personal use such as toilet flushing, reducing the requirement for mains supplied potable water.	B	4	M

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigatio n
	Potential for disturbance to site soils during construction, with minor potential to impact upon stormwater runoff.	C	3	M	With the limited site disturbance required to establish the site the erosion and sediment controls suggested within this report, along with the key management strategy of planning ground disturbance works for outside of forecast inclement weather periods are considered sufficient to limit the potential for possible stormwater impacts.	D	4	L
	Run-off/sedimentation impacts to the riparian corridor and Breakfast Creek located to the south of the site.	D	4	L	It is understood that Council has recently undertaken environmental restoration works within the Breakfast Creek. These works initially included the creation of a formed creek line, and now have progressed to include vegetation and environmental restoration works within the riparian zone. Additional mitigation measures other than those already included in the EIS are not considered necessary.	D	4	L
	Typical site operations are not expected to encounter or disturb acid sulphate soils, nor lower the water table on	E	5	L	No additional mitigation measures required.	E	5	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	adjacent lands to expose acid sulphate soils to oxidation.							
	As the site will not be excavating material or extracting groundwater, it is not expected that the site operations will impact the regional groundwater quality or quantity. As such it is not proposed to undertake a groundwater monitoring program on the site.	E	5	L	No additional mitigation measures required.	E	5	L
	Potential impact on the Breakfast Creek riparian corridor.	C	3	M	Although exempt from controlled activity approval under the WM Act, redevelopment of the site has been designed to meet as far as practicably possible, the new rules developed by NOW (2012) regarding controlled activities within riparian corridors.	D	4	L
Contaminated Land	Although some potential for residual contamination remains, based on the results of this Phase I ESA and in particular the absence of	C	2	H	A contingency for the appropriate management of potential unexpected contamination finds should be incorporated in the Construction Environmental Management Plan (CEMP) for the planned	C	4	M

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	potentially complete SPR linkages as presented in the CSM, along with the planned continued industrial land use at both properties, it is considered that further investigation is not required at this stage in order to facilitate the proposed redevelopment.				redevelopment of both properties. If localised contaminated soils are encountered during construction works, they shall be segregated and assessed for waste classification and appropriately disposed of or re-used onsite, subject to the results of testing. If significant contamination is encountered during construction works, further investigation in the form of a Phase 2 Environmental Site Investigation (ESA) may be required. All pollution incidents that threaten or harm the environment shall be reported immediately to relevant authorities in accordance with the *Protection of the Environment Operations Act 1997* (POEO Act); and A Hazardous Materials Register and respective Safety Data Sheets (SDSs) shall be kept on site at all times and regularly maintained.			
Hazard and Risks	The PHA indicated that there was no significant offsite impact from the use of dangerous goods on site due to the small inventories involved.	E	5	L	No additional mitigation measures required.	E	5	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	The NSW criteria for injury were not reached at sensitive or residential land use zones.	E	5	L	No additional mitigation measures required.	E	5	L
	The potential for offsite fatality and property damage was limited to the scenario of a 45 kg LPG cylinder rupture in the dangerous goods store. The NSW criteria for offsite fatality and property damage are considered satisfied due to the rarity of LPG cylinder ruptures	E	1	H	At least one hose reel and one fire extinguisher be provided for the oxygen and LPG cylinder storage. Provide one powder type extinguisher and one foam extinguisher for all bulk class 3 dangerous goods on site. This includes the storage of fuel and oil removed from vehicles prior to shredding. This recommendation assumes the recovered liquids are stored in intermediate bulk containers.	E	3	L
Fire and Incident	Floc material has been identified as a potential source of fire.	C	1	H	Floc material will be managed by keeping the stockpile small, so as not to consider the warehouse in which it is kept as a high hazard occupancy. Water cannons will also be provided for the various stockpiles.	D	2	M

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	Any uncontrolled leaks or spills have the potential to contaminate soils within unsealed sections of the site, or be entrained in stormwater flow to the detention basin at the rear of the site. Overflow of potentially contaminated water from the detention basin, has the potential to detrimentally impact on Breakfast Creek.	C	2	H	The site will be kerbed to retain spillages or stormwater run-off, which outflow via a detention basin. Spill kits will be available on-site and be deployed to manage and contain minor spills. All pollution incidents that threaten or harm the environment shall be reported immediately to relevant authorities in accordance with POEO Act. A Fire and Incident Response Management Plan will be developed for the expanded site.	D	4	L
Transport	Traffic impact assessment has indicated that compared against the existing operational traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development is negligible and could not be expected to compromise the safety or function of the surrounding road	E	5	L	No additional mitigation measures required.	E	5	L

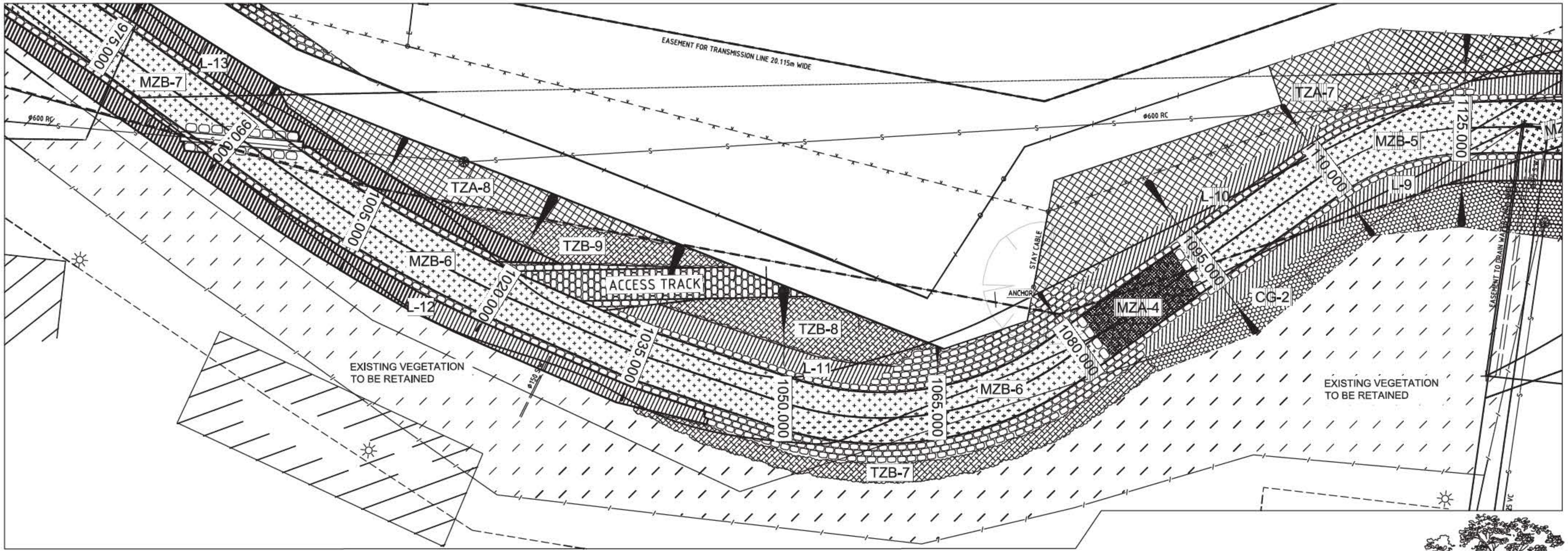
Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	network.							
	Possible minor impacts associated with construction traffic	D	3	M	Once the contractor has been appointed, a site-specific construction traffic management plan (CTMP) should be prepared prior to works commencing on-site detailing construction traffic volumes, truck routes, access arrangements and construction worker parking arrangements.	E	5	L
Social and Economic	The proposed expansion of the site will provide for increase labour force, creating positive flow-on effects to the local economy. The proposed expansion of the site will also enable Sell and Parker to utilise the available plant capacity in order to better respond to community expectations for efficient an effective metal resource recovery and recycling facilities.	A	4		Improvement - no mitigation measure required.	A	4	
	The proposed education and training centre will	A	4		Improvement - no mitigation measure required.			

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	promote recycling initiatives and to explain the nature of resource recovery. The centre will provide support and seek to participate with the education programme in schools and tertiary education facilities, thus positively contributing to the local community.							
	In the short term, construction works may have a minor negative impact on surrounding business with regards to amenity, noise, air and traffic	C	4	M	These impacts can be appropriately managed with implementation of mitigation measures stated through EIS	D	5	L
Visual	The proposed development will not result in significant visual impacts in the vicinity of the site or neighbouring areas.	E	5	L	No additional mitigation measures required.	E	5	L
Waste	The proposed development will involve the generation of various types of waste	C	2	H	A number of mitigation measures have been proposed to manage waste in accordance with the Waste Hierarchy and ensure appropriate	D	4	L

Environmental Issue	Unmitigated Potential Impacts / Inherent Risk	Probability	Consequence	Potential Risk Prior to Mitigation	Actions / Proposed Mitigation Measures	Residual Probability	Residual Consequence	Potential Residual Risk Post Mitigation
	streams, which if not managed appropriately have the potential to impact on the receiving environment				receipt, handling and disposal of waste			

Annex F

BREAKFAST CREEK AND RIPARIAN ZONE- ADDITIONAL DOCUMENTATION

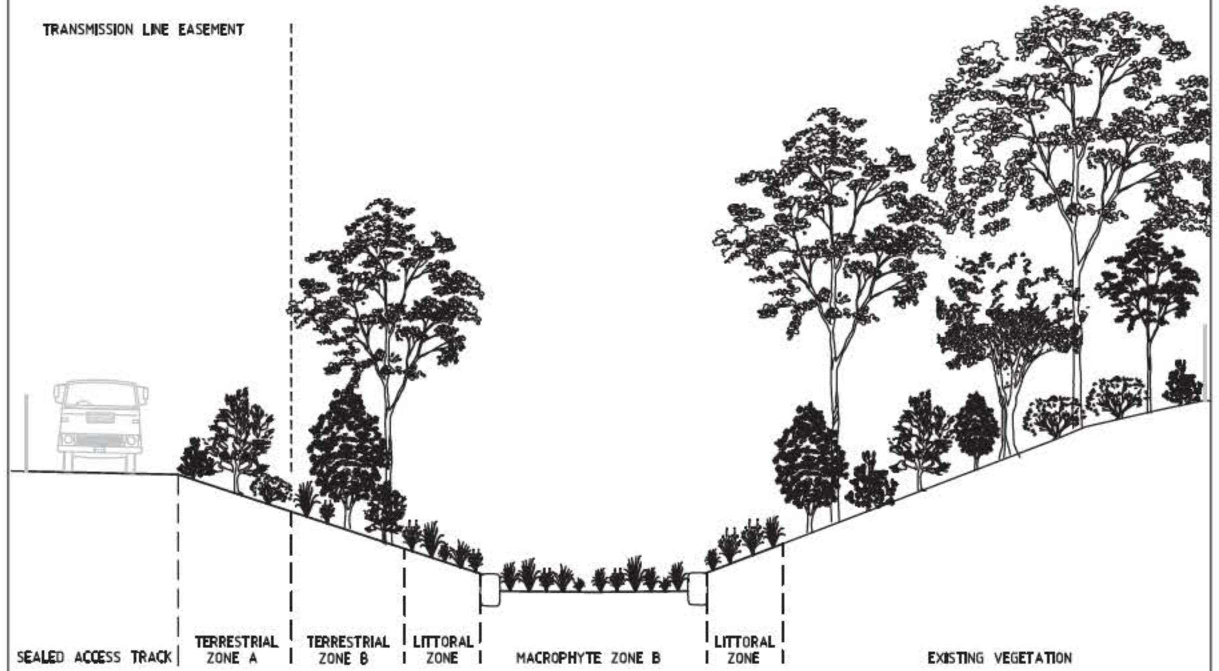


NOTE:

1. REFER TO ENGINEERING DRAWINGS FOR ROCK RETAINING WALLS, RIP RAP PLACEMENT, GRADING & DRAINAGE WORKS.
2. REFER TO PLANT SCHEDULE FOR PLANT SPECIES IN EACH ZONE.

LEGEND:

- MACROPHYTE ZONE A
- MACROPHYTE ZONE B
- LITTORAL ZONE
- TERRESTRIAL ZONE A
- TERRESTRIAL ZONE B
- CASAURINA GLAUCA
- CASCADING CASUARINA
- REVEGETATION ZONE
- RETAINED EXISTING VEGETATION
- TREE FREE ZONE (OVERHEAD POWERLINE)
- TREES TO BE REMOVED
- TREES TO BE RETAINED



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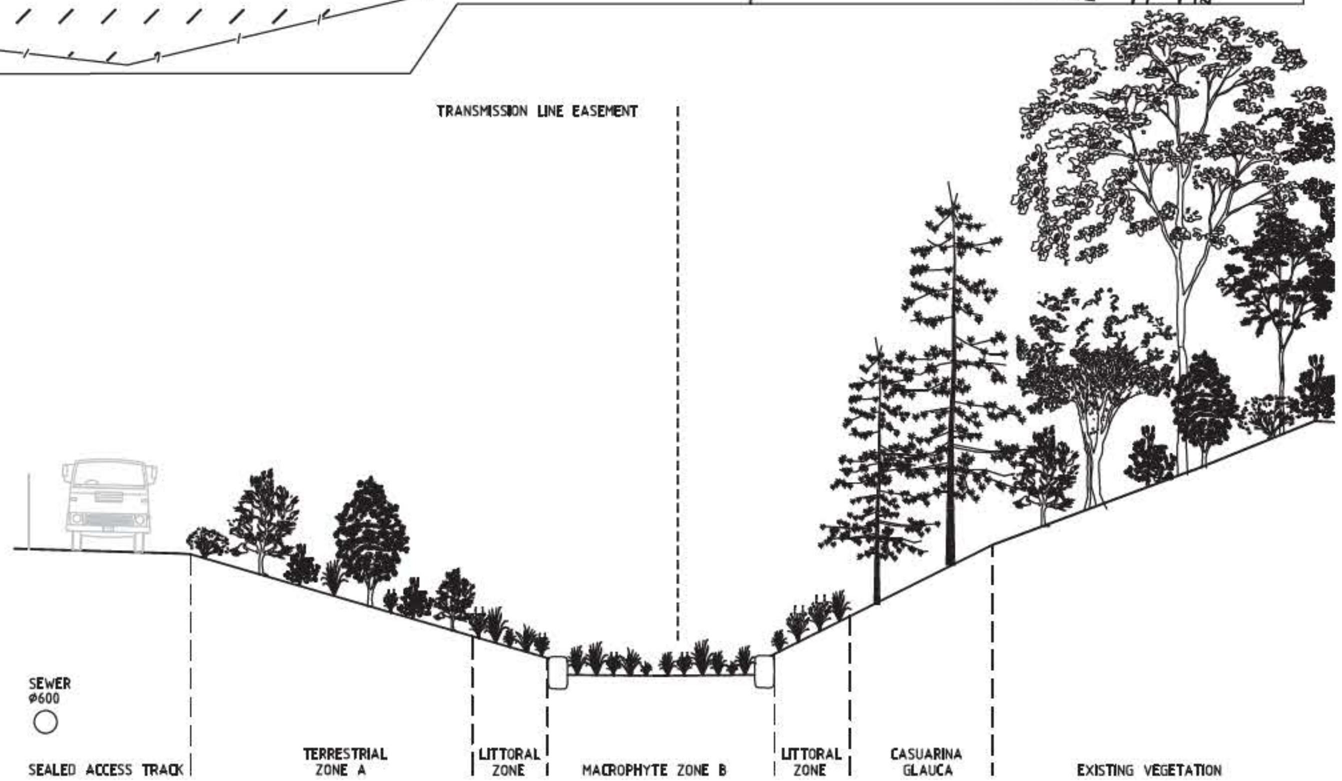

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CONSTRUCTION

PREPARED BY:

REV	DATE	DESCRIPTION	CHECKED	APPROVED	DATE
A	AUG '11	CONSTRUCTION	G.E	T.N	AUG '11

PUBLIC UTILITIES LEGEND

WATER MAINS	—W—	GAS	—G—	TELSTRA	—T—
HYDRANT		GAS VALVE		TELSTRA PIT	
STOP VALVE		ELECTRICITY	—E—	TELSTRA PILLAR	
WATER METER		ELECTRICITY PIT		TELSTRA POLE	
WATER TAP		POWER POLE		OPTUS CABLES	—OP—
SEWER	—S—	POWER LIGHT POLE		SECONDARY GAS	—SG—
SEWER LAMPHOLE		LIGHT POLE		UECOMM CABLE	—Uec—
SEWER MANHOLE		STAY POLE			

DATUM AHD
GRID MGA
SHEET SIZE A1
TITLE BLOCK VERSION A

SURVEYED LP
DESIGNED L.T
CADD L.T
VERIFIED
DATE

APPROVED
MANAGER ASSET DESIGN SERVICES
DATE
CLIENT
DATE

Blacktown City Council

COUNCIL CHAMBERS 62 FLUSHCOMBE ROAD, BLACKTOWN
ALL MAIL: GENERAL MANAGER PO BOX 63, BLACKTOWN NSW 2148
TELEPHONE: (02) 9839 6000 FAX: (02) 9831 1961
DX: 8117 BLACKTOWN

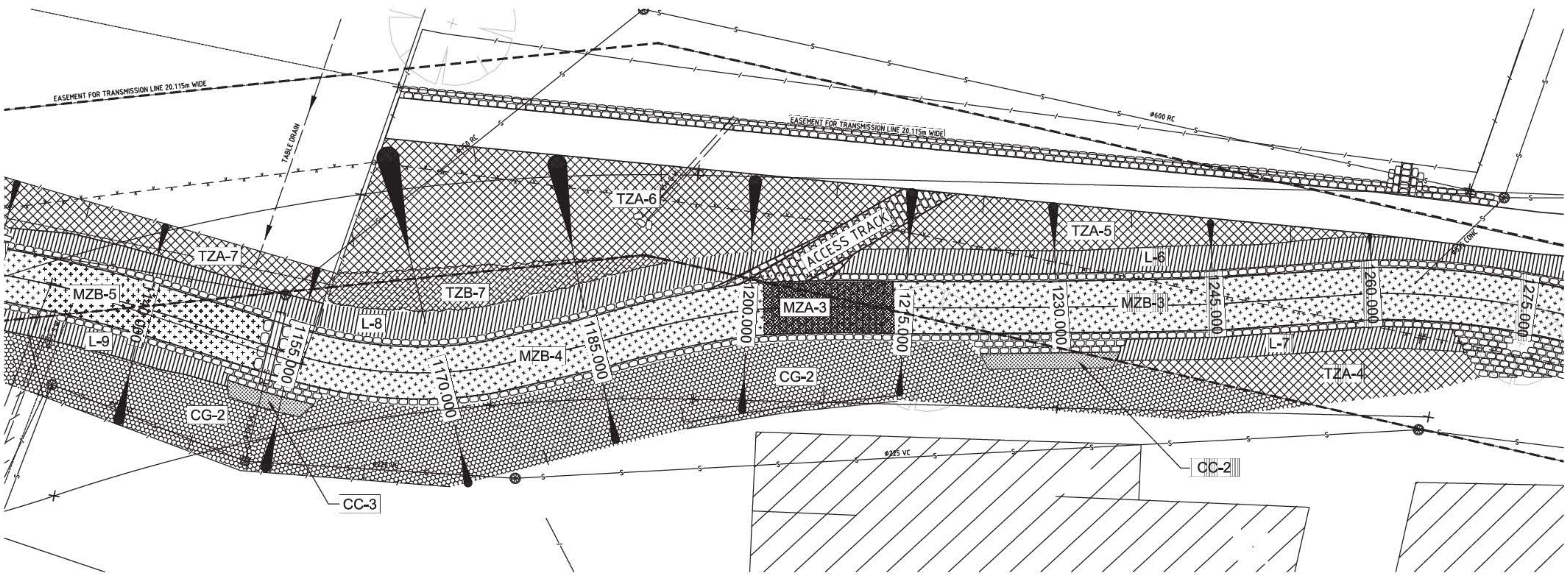
PLAN	200	2 0 2 4 6
LONG SECTION HORIZ	200	2 0 2 4 6
VERT	100	1 0 1 2 3
CROSS SECTIONS	100	1 0 1 2 3

PROJECT TITLE: BREAKFAST CREEK KINGS PARK REHABILITATION WORKS
SHEET TITLE: LANDSCAPING PLAN - CHAINAGE 975.0 TO 1125.0

CAD FILE: E7420V
FILE No: 452-17-QA1
PLAN No: E74/20V

ISO 9001
Lic No.QAC/R61/0103
ASSET DESIGN SERVICES

SHEET 38 OF 44 SHEETS
REV D



NOTE:

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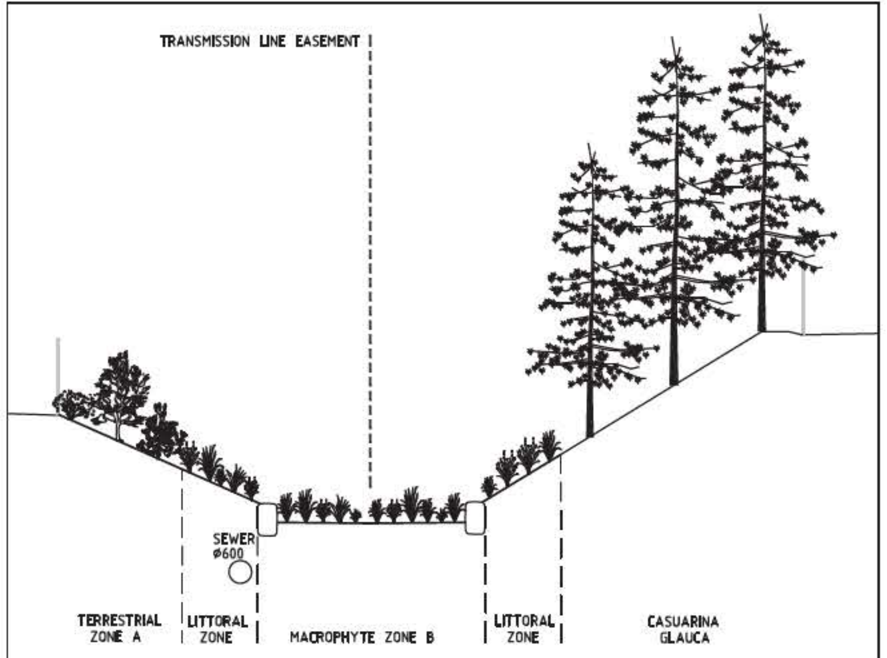

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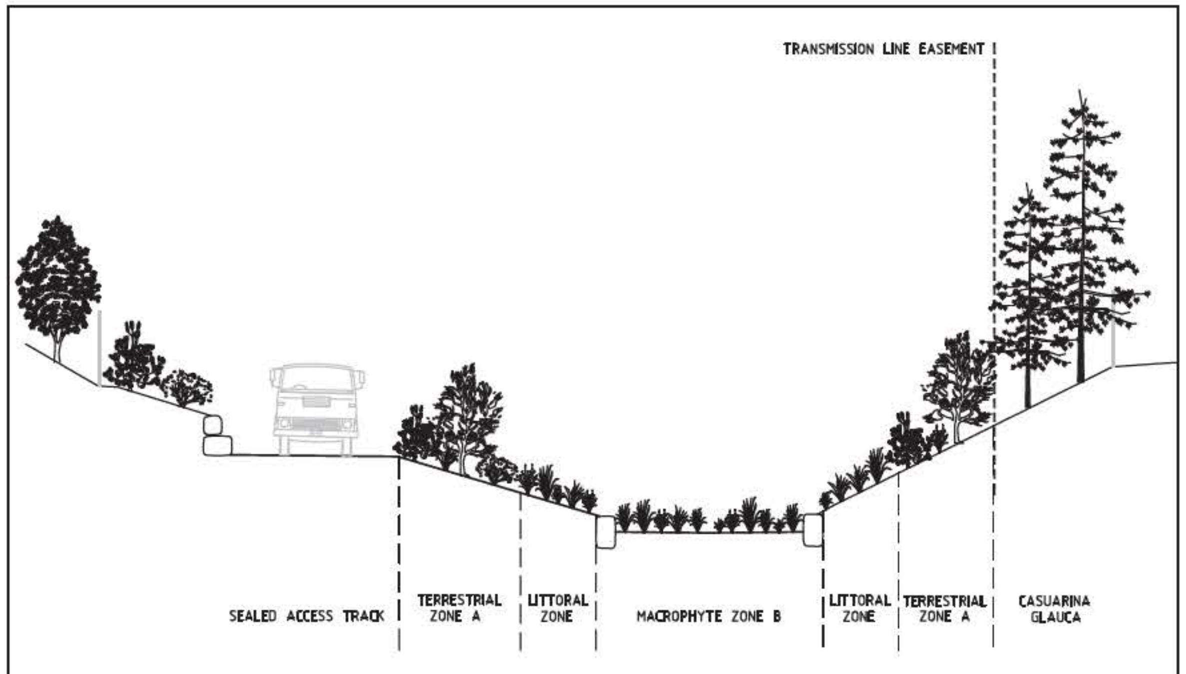

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SCALE 1:100

CONSTRUCTION

PREPARED BY:

REV	DATE	DESCRIPTION	CHECKED	APPROVED	DATE
D	JUNE '13	ACCESS RAMP REDESIGN	G.E	T.N	JUNE '13

PUBLIC UTILITIES LEGEND

WATER MAINS	—W—	GAS	—G—	TELSTRA	—T—
HYDRANT	□	GAS VALVE	#	TELSTRA PIT	◪
STOP VALVE	▲	ELECTRICITY	—E—	TELSTRA PILLAR	⊘
WATER METER	M	ELECTRICITY PIT	E	TELSTRA POLE	●
WATER TAP	○	POWER POLE	○	OPTUS CABLES	—OP—
SEWER	—S—	POWER LIGHT POLE	○	SECONDARY GAS	—SG—
SEWER LAMPHOLE	⊙	LIGHT POLE	☼	UECOMM CABLE	—Uec—
SEWER MANHOLE	⊛	STAY POLE	⊘		

DATUM AHD

GRID MGA

SHEET SIZE A1

TITLE BLOCK VERSION A

SURVEYED L.P

DESIGNED L.T

CADD L.T

VERIFIED

DATE

APPROVED

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PLAN	200
LONG SECTION HORIZ	200
VERT	100
CROSS SECTIONS	100

PROJECT TITLE: BREAKFAST CREEK KINGS PARK REHABILITATION WORKS

SHEET TITLE: LANDSCAPING PLAN - CHAINAGE 1125.0 TO 1275.0

CAD FILE: E7420V

FILE No: 452-17-QA1

PLAN No: E74/20V

ISO 9001 International Standards Certification

Lic No.QAC/R61/0103

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SHEET 39 OF 44 SHEETS

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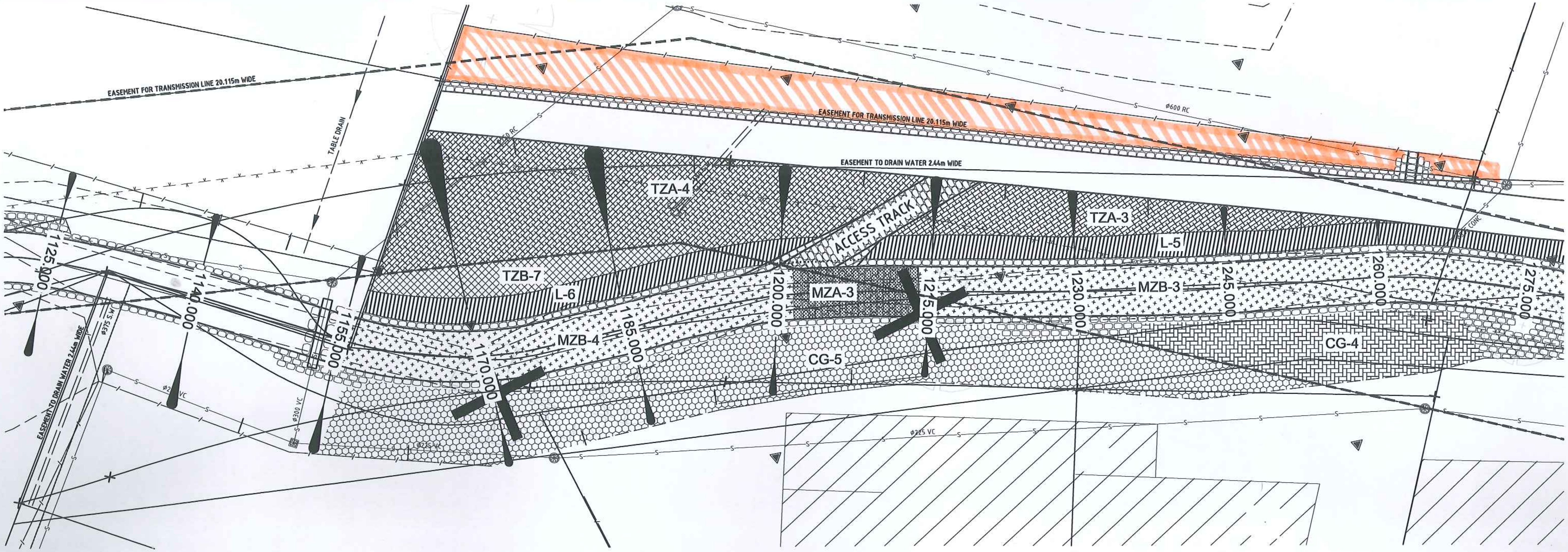

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- TREES TO BE REMOVED
- TREES TO BE RETAINED
- SCREENING MIX

NOTE:

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2. REFER TO PLANT SCHEDULE FOR PLANT SPECIES IN EACH ZONE.

SCREENING MIX

PLANT NAME	PLANTS/ SQ.M	SIZE	QTY
ACACIA DECURRENS (20%)	1 / SQ.M	150mm	76
ACACIA FALCATA (10%)	1 / SQ.M	150mm	38
BURSARIA SPINOSA (20%)	2 / SQ.M	150mm	152
INDIGOPHERA AUSTRALIS (10%)	1 / SQ.M	150mm	38
LEPTOSPERMUM PETERSONII (15%)	1 / SQ.M	150mm	57
LOMANDRA LONGIFOLIA (15%)	4 / SQ.M	50mm TUBE	228
MELALEUCA LINARIFOLIA (10%)	1 / SQ.M	150mm	38

CONSTRUCTION

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D	JUNE '13	ACCESS RAMP REDESIGN	G.E	T.N	JUNE '13

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WATER MAINS —W— | HYDRANT | STOP VALVE | WATER METER | WATER TAP | SEWER —S— | SEWER LAMPHOLE | SEWER MANHOLE
GAS —G— | GAS VALVE | ELECTRICITY —E— | ELECTRICITY PIT | POWER POLE | POWER LIGHT POLE | LIGHT POLE | STAY POLE
TELSTRA —T— | TELSTRA PIT | TELSTRA PILLAR | TELSTRA POLE | OPTUS CABLES —OP— | SECONDARY GAS —SG—

DATUM AHD
GRID MGA
SHEET SIZE A1
TITLE BLOCK VERSION A

SURVEYED LP
DESIGNED L.T
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PLAN 200
LONG SECTION: HORIZ 200
VERT 100
CROSS SECTIONS 100

PROJECT TITLE: BREAKFAST CREEK KINGS PARK REHABILITATION WORKS
SHEET TITLE: LANDSCAPING PLAN - CHAINAGE 1125.0 TO 1275.0

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SHEET 39 OF 44 SHEETS
REV D