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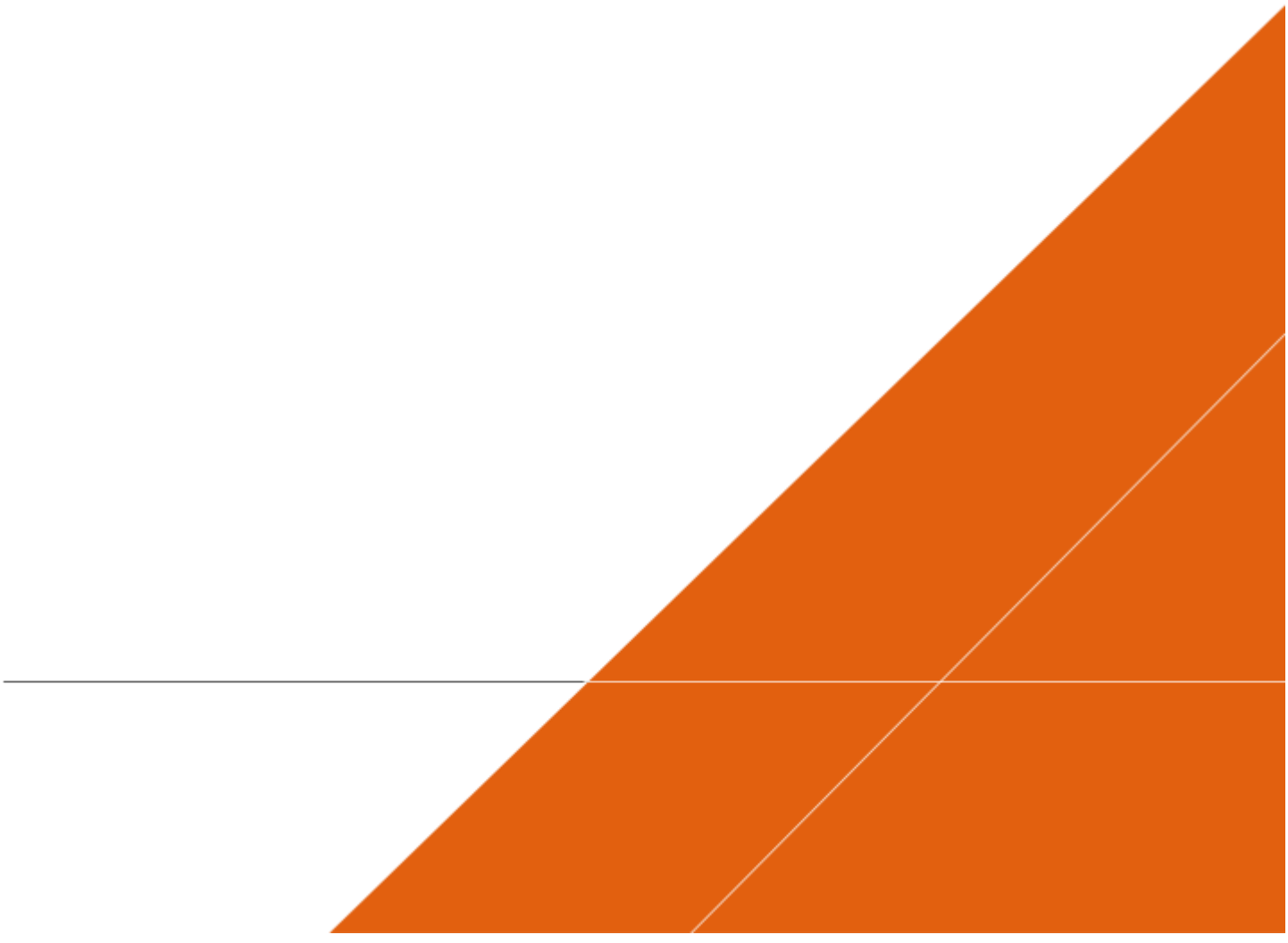
KINGS PARK METAL RECOVERY AND RECYCLING FACILITY EXPANSION

Flood Assessment Report

08 JULY 2020



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SELL AND PARKER
KINGS PARK METAL RECOVERY AND RECYCLING FACILITY EXPANSION

Flood Assessment Report

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REVISIONS

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0	19/06/2020	Draft for client comment	VN	SF
1	8/07/2020	Revised draft report	VN	SF

CONTENTS

APPENDICES

1 INTRODUCTION

Sell and Parker (the Applicant) currently own and operate a resource recovery facility (RRF) at 23-43 and 45 Tattersall Road, Kings Park (the Proposal site). The RRF currently operates under approval SSD 5041 and three associated modifications (the Original Approval).

The Applicant is seeking approval to increase the throughput limit of the RRF from 350,000 to 600,000 tonnes per annum (tpa) (the Proposal). Approval for the Proposal is sought as State Significant Development (SSD) under Part 4, Division 4.7 of the Environmental Planning and Assessment 1979 (EP&A Act).

The increase in throughput limit would allow the Applicant to recycle up to 600,000 tpa of scrap metal (from both on-site and external sources). The Proposal would assist in achieving the higher recycling contamination standards prescribed by China's National Sword Policy as well as further reducing the volume of scrap metal that goes to landfill.

The existing infrastructure at the Proposal site has the capacity to accommodate the increased throughput and the Proposal would not require any physical works or change to the nature of operations. However, some adjustments to site management practices such as internal traffic flows and scheduling would be required

1.1 Aim of this Report

In accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs), provided as **Appendix A**, a detailed flood assessment is required for the Proposal.

The purpose of the flood assessment is of two-folded, first to define the existing flood conditions of the Proposal site and secondly to confirm the Proposal will not cause flood impact to the neighbouring properties.

This report outlines the flood assessment undertaken. Firstly, this has involved revising the Council flood model to better define the flood regime within and immediately surrounding the Proposal site based on available information. Secondly, the Proposal impacts on the Proposal site conditions have been reviewed and considered with respect to the flood regime.

2 EXISTING FLOOD BEHAVIOUR

The Proposal site is located in the northern floodplain of Breakfast Creek within the Blacktown Council local government area. It is bounded by Tattersall Road to the north, Breakfast Creek to the south, an open channel section of Waller Creek to the east and “Pick ‘N Payless Self-Serve Auto Parts” to the west. **Figure 1** shows the locality and the major waterways adjoining the Proposal site.

Figure 1 - Site Locality Plan (Aerial Photo LPI Imagery 2017-2018)

2.1 Existing Flood Information

2.1.1 Blacktown Council Information

Blacktown City Council Maps Online indicates the Proposal site is flood prone. Various parts of the Proposal site are currently zoned under low, medium and high flood risk precincts. **Figure 2** shows the flood risk zoning across the Proposal site.

Blacktown City Council has updated the Floodplain Planning Study for Eastern Creek from 2013 to 2016. The study consisted of several stages (**Ref 5**):

a) Stage 1 Hydrologic Assessment undertaken by WMA Water (2013) to update the existing flow estimates across the Eastern Creek catchment using an XP-RAFTS hydrologic model.

b) Stage 2 Hydraulic Assessment undertaken by Catchment Simulation Solutions (2014) to determine the flow regime of major waterways and the floodplain using TUFLOW, adopting hydrologic information from the Stage 1 Hydrologic Assessment.

c) Stage 2 Hydraulic Assessment Extension undertaken by Catchment Simulation Solutions (2016) to further refine the TUFLOW model as part of the Eastern Creek Development Scenario Hydraulic Assessment.

The XP-RAFTS hydrologic (2013) and TUFLOW hydraulic flood model (2014) were made available from Council for this flood assessment. The 2016 Stage 2 Hydraulic Assessment Extension was not provided by Council. It is unclear what the status of this assessment is.

The XP-RAFTS hydrologic model is based on Australian Rainfall and Runoff 1987 methodology for the generation of rainfall runoff.

The TUFLOW flood model utilises:

- A 4 metre grid size
- Ground surface terrain based on 2010 Lidar information
- Buildings represented as high material roughness with footprint elevation nominally raised from Lidar level
- 1D representation of major open channels and cross drainage structures excluding Council minor pit and pipe drainage network.

Figure 2 - Blacktown City Council Flood Risk Precincts (Source: BCC Maps Online)

2.1.2 100-year ARI Flood Conditions

Figure 3 shows the existing 100-year ARI (Average Recurrence Interval) flood conditions extracted from the Stage 2 Hydraulic Assessment report. **Figure 4** presents the hydraulic flood hazard conditions for the 100-year ARI. **Figure 3** shows overland flooding across the Proposal site originates from overtopping of the Waller Creek open channel along the eastern boundary just south of Tattersall Road. The overflow then travels westward across the Proposal site towards the neighbouring lot of “Pick N Payless”.

For the 100-year ARI design flood event, the Proposal site is subject to considerable inundation with the maximum flood depth exceeding 1.0 metre. Ponding of overland flow occurs within the Proposal site as a considerable portion of the Proposal site is lower than the downstream ground level along the western site boundary. No overtopping of flows to the Proposal site was predicted from Breakfast Creek to the south for the 100-year ARI design flood event.

The yellow polygons shown in **Figure 3** highlight the area at risk of overland flooding, with **Figure 4** showing the Flood Hazard Category. The Stage 2 Hydraulic Assessment mapping remarked that the flood regime shown is subject to uncertainty and would require more detailed assessment. Limitations of the Council flood model and revisions undertaken for the Proposal site are discussed further in **Section 2.2.1.**

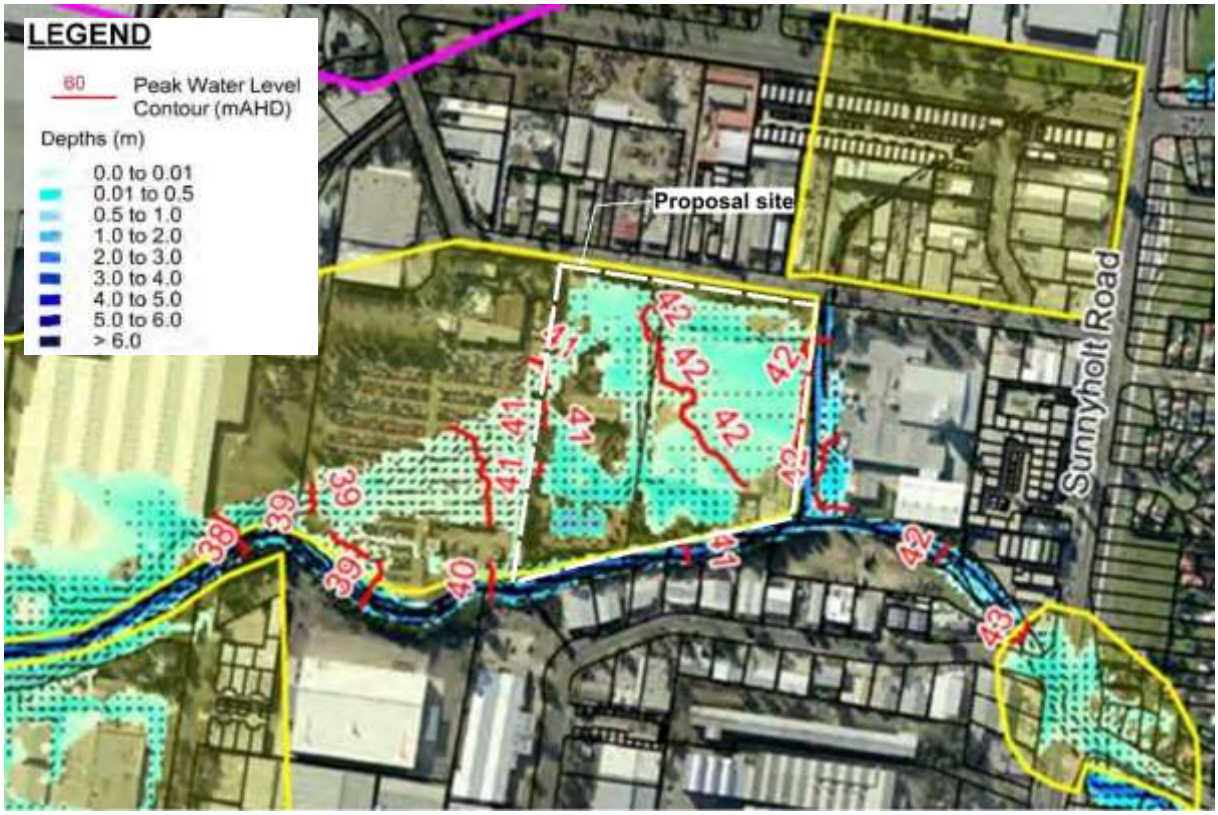

Figure 3 - Existing Flood Conditions, 100- year ARI Event (Extracted from Council Flood Report)

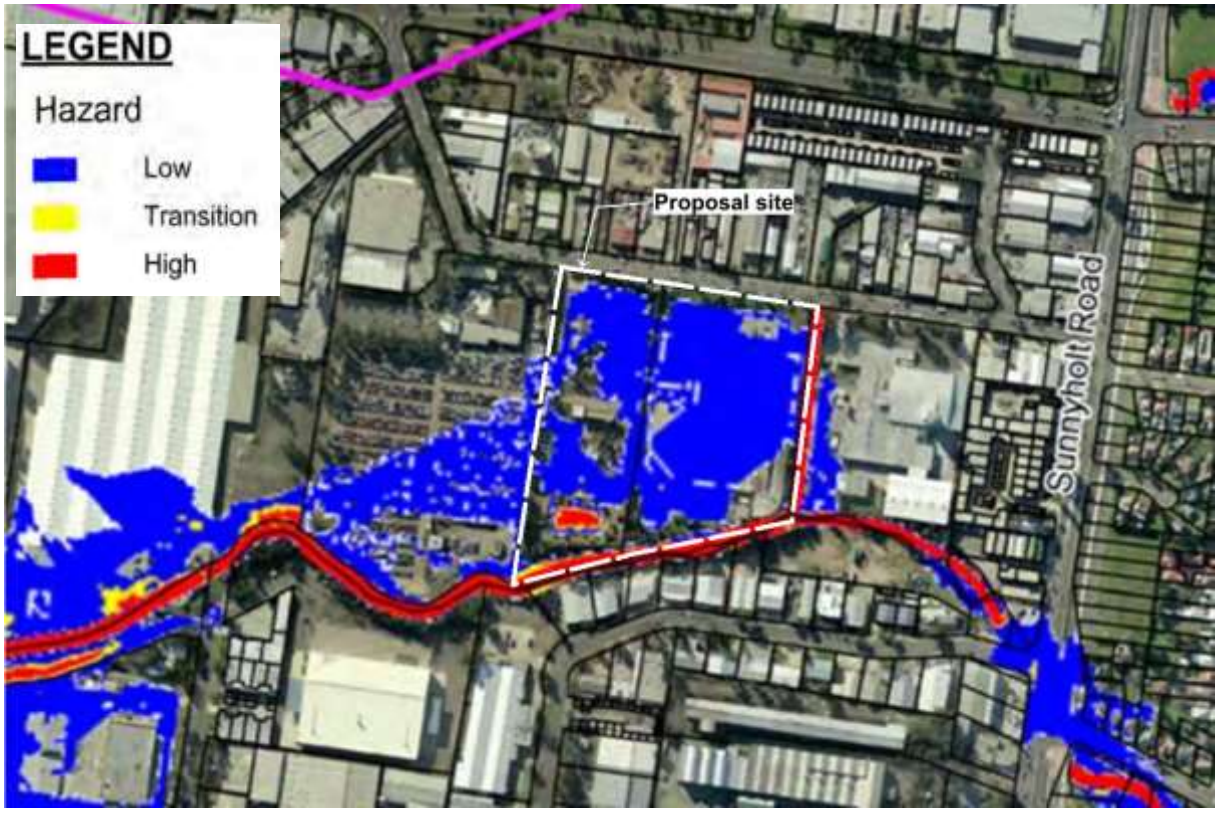

Figure 4 - Existing Flood Hazard Conditions, 100-year ARI Event (Extracted from Council Flood Report)

2.2 Flood Model Revision

2.2.1 Limitation of Council Model

The Council flood modelling provides a prediction of the flood regime on a regional scale. The approach adopted in the Council model has been based on generic topographic assumptions including:

- The use of aerial laser survey (Lidar) for ground level information
- Utilisation of remote sensing generated building footprints
- Adoption of artificial upward adjustment of Lidar ground level by 0.3 metre to represent indicative building floor level
- Building footprints represented as areas of high roughness.

These are commonly accepted approaches for regional flood studies to produce a reasonable flood regime prediction on a broadscale. However, the flood regime prediction may not be adequate at a site-specific scale as the local flood regime could be significantly affected by local topographic features which may not be accurately captured by the generic assumptions. Additional refinement of the Council flood model is required to better represent the existing conditions and consequently flood regime of the Proposal site, as outlined in **Section 2.2.2**.

Changes to the existing conditions of the Proposal site and surrounds have occurred since the Council flood model was developed. The topography in the Council's flood model has been based on 2010 Lidar survey. Alternations (through recent approvals) have been made to the building arrangement within the Proposal site.

There is also the possibility of changes in the immediate surrounding area. Incorporating updated information into Council flood model is required to better represent the existing conditions and consequently flood regime of the Proposal site, as outlined in **Section 2.2.2**.

2.2.2 Model Enhancement

To provide a better estimate of the flood conditions locally for the Proposal site, specific site information has been gathered and represented in the flood model. The following adjustments have been made to 2014 Council flood model to enhance and update the topographic representation of the Proposal site and surrounding areas:

a. **Lidar Revision**
   Adoption of the June 2019 Lidar data available from NSW Spatial Services ELVIS (Elevation and Depth – Foundation Spatial Data) for the area of interest to reflect the latest topographic changes to Proposal site and the surrounding areas. **Figure 5** shows the extent of the 2019 Lidar adopted in the flood modelling.

   Complete replacement of the 2010 Lidar with the 2019 Lidar for the entire flood model has not been attempted as this would also require extensive review and potential revision of the model details across the full flood model extent.

   It is worth noting that revision of the full flood model extent may lead to considerable changes to regional flow regime. As the Council model has previously been verified with modelling results of other studies, preserving the downstream and upstream flood conditions are fundamentally important to maintain a baseline for this flood assessment. The adopted approach for this flood assessment has been to ensure no substantial flood regime changes in the areas outside the area of interest, as represented in the 2014 Council flood model.

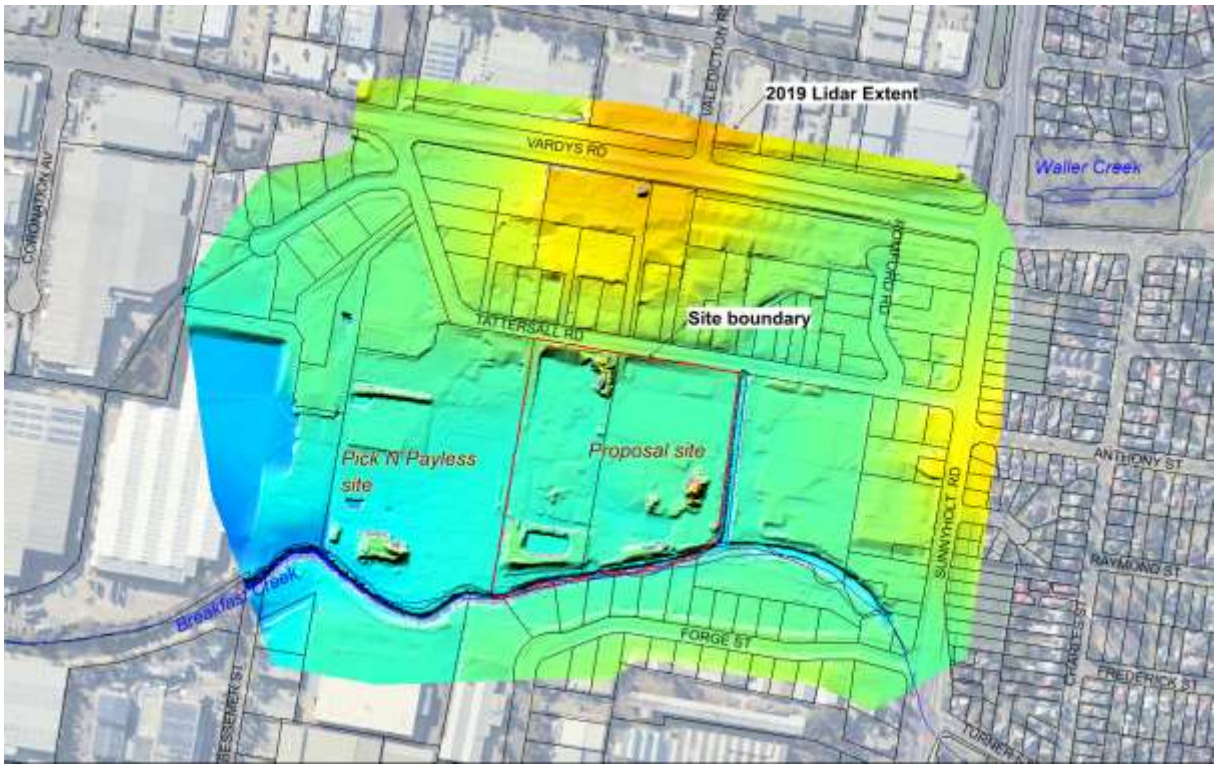

Figure 5 - Extent of 2019 Lidar Adopted in Flood Model

b. **Building Footprints**
Update of the building footprints within the Proposal site and 57 Tattersall Road. Update of the 57 Tattersall Road building footprints has been based on June 2020 Nearmap Aerial imagery. For the Proposal site the building footprints have been based on the topographical survey undertaken by East Coast Surveyors in early 2020 (provided as **Appendix B**).

c. **Building Representation – Permanent Structures**
Footprints of the permanent building structures within the Proposal site and 57 Tattersall Road sites are assumed to be solid objects and provide full blockage of overland flow. This modelling approach is in lieu of the generic elevation assumption of 0.3 metre floor level above the Lidar ground level which has been adopted in the 2014 Council model. The approach will produce a slightly conservative flood level as it does not account for the flood storage effect within the building footprint. **Figure 6** shows the permanent structures adopted in the flood model.

d. **Building Representation – Temporary Structures**
Additional temporary structures have been added to the flood model within the Proposal site. The ground level of all temporary structures, such as shipping containers and mobile cranes, has been assumed to be 0.3 metre above the ground level. A Manning's roughness of 1 is applied for flow across the building footprint to represent resistance to overland flows. This modelling approach is similar to the general treatment applies to all building structures in the original Council model. Given that the number and size of the temporary structures is small, this modelling approach is not expected to have a significant bearing on the resulting flood regime. **Figure 6** shows the temporary structures adopted in the flood model.

Figure 6 – Localised Adjustments to Council's Flood Model

e. **Local Fences**
Incorporation of all permanent solid fences and sound walls within the Proposal site which may potentially influence local overland flow paths. These include all the concrete/masonry walls and sound wall structures shown in the latest topographical survey. **Figure 6** shows the location of wall structures in the flood model.

f. **Open Channel Interface**
Adjustment of 1-D/2-D interface along the Waller Creek open channel and Breakfast Creek channel to ensure the influence of the existing sound wall along the waterways is properly modelled. A ridgeline has also been incorporated along the western edge of the open channel based on the surveyed ground level to precisely control overflow from the channel into the Proposal site in flood simulations.

Note that the flood model has not included the existing stormwater drainage network in the Proposal site. It is anticipated that most of the stormwater inlets would likely be blocked by debris collected in the stockpiling area during a major storm event. The resulting flood regime will be slightly conservative under this assumption.

2.2.3 Stockpile Considerations

Ground conditions of the Proposal site can vary as stockpiles experience minor fluctuations in size on a daily basis. However, stockpile locations would not have significant changes as part of the Proposal. The flood regime presented in **Figure 7** and **Figure 8** is representative for the ground level conditions at the time of the Lidar survey taken in June 2019.

The main stockpile areas are located in the north-western corner of the Proposal site and the area east of the Building 'B'. These areas are generally above 100-year flood level and would have little impact on the flood regime. However, the amount of stored material on the stockpile areas near the weighbridges, located next to the main ponding areas, may affect the overall flood storage within the Proposal site and consequently the peak flood levels.

2.2.3.1 Potential Flood Storage Volume Impact

The topographical survey undertaken in April 2020 (**Appendix B**) provides more recent ground level information than the 2019 Lidar. Some differences in the ground levels are apparent between the two surveys. The variations in ground level information could be due to the different measurement methods (topographical survey vs Lidar) and also as a result of the minor fluctuations in stockpile volumes that occurs on a daily basis. As the accuracy of Lidar for hardstand surface in an open area is high (in the order of 15 millimetre vertically and 40 millimetre horizontally), it is likely that the difference between the surveys are largely to due to stockpile conditions. By comparing the 2019 Lidar and 2020 topographical survey information (illustrated in Error! Reference source not found.), the potential impact of the stockpile volumes on f lood storage can be estimated.

In comparing the two survey data sets within the 100-year ARI inundated Proposal site, a statistical analysis of 1,728 data points indicates and average level difference of 0.012 metre with the 2020 topographical survey being slightly lower than 2019 Lidar. The Proposal site flood extent covers a footprint of approximately 21,000 square metres. The potential difference in flood storage volume can be estimated as 21,000 square metres x 0.012 metre, equalling approximately 250 cubic metres. This volume is representative less than 5% of the overall flood storage within the Proposal site for the 100-year ARI design flood event.

With the difference in flood storage volume between the two surveys being relatively small, it is not expected to result in a significant impact on the flood regime.

This analysis attempts to consider the variation in stockpile volumes and potential impact on flood storage during existing site operations. It is unknown whether the Proposal site stockpiles were at a minimum or maximum volume when each of these

surveys were undertaken. For the purpose of this flood assessment it has been assumed that the stockpile volume at the time of the 2019 Lidar are representative of typical volumes held on the Proposal site.

The stockpile volume represents a Proposal site condition requiring an assumption in the flood modelling. However, this is not unlike other catchment conditions which typically require assumptions in flood modelling such as drainage network blockages and stability of fences. Variations in catchment conditions have the potential to impact the local flood regime and as such the flood model attempts to represent “typical” conditions based on best available information at the time.

The volume of stockpiles on the Proposal site are not proposed to be increased as part of the Proposal, as discussed further in **Section 3** below.

2.3 Revised Flood Modelling Results

2.3.1 100-year ARI Flood Conditions

With the modification of the 2014 Council flood model described above in **Section 2.2** the 100-year ARI design flood event was simulated. The revised flood model indicates that 2-hour design event is the critical duration for mainstream flooding over the Kings Park area in which the Proposal site is located. The flood levels within the Proposal site has a critical duration of 3-hours due to the flood storage effect.

Figure 7 shows the 100-year ARI flood regime of the Proposal site. The open channel overflow enters the Proposal site immediately downstream of Tattersall Road. The overland flow firstly fills the low-lying areas on the Proposal site before its spills across the site boundary to the west to 57 Tattersall Road. The open channel overflow seems to be controlled by the gap between the boundary sound walls and the kerb level along the boundary.

It can be seen that the predicted flood regime is similar to the 2014 Council Hydraulic Assessment flood mapping shown in **Figure 3**. The similarity between the Council and revised flood modelling results highlights the robustness of the predicted flood regime which is relatively insensitive to the additional flood model refinements outlined in **Section 2.2**.

The refined flood modelling shows there is no significant direct flow exchange between the Proposal site and Breakfast Creek channel to the south. Within the Proposal site the predicted maximum flood depth is about 1 metre located immediately north of the detention/irrigation basin.

Figure 8 presents the flood hazard for the 100-year ARI design event. The hydraulic flood hazard categories follow the definitions defined by New South Wales Floodplain Development Manual 2005. Most of the operational part of the Proposal site is classified as low hazard category, except for some isolated high hazard areas, which are related to significant flood depths with low flow velocities. The Proposal site has an estimated flood storage of approximately 6,000 cubic metres.

2.3.2 Other Design Flood Events

Despite the additional refinements to the Council flood model, the predicted flood regime for the 100-year ARI design flood event remains consistent with that present in the Council 2014 Council Hydraulic Assessment. As such the flood regime for more frequent smaller flood events, and larger rarer flood events is not expected to vary significantly from that presented in Council’s 2014 Council Hydraulic Assessment. Given this finding, the fact that the Proposal would not require construction of any additional infrastructure or change to the nature of operation, and the finding of the

flood impact assessment discussed in **Section 3.2**, additional review of other design flood events was not considered warranted for this flood impact assessment.

Figure 7 - Flood Depth and Level, 100-year ARI event

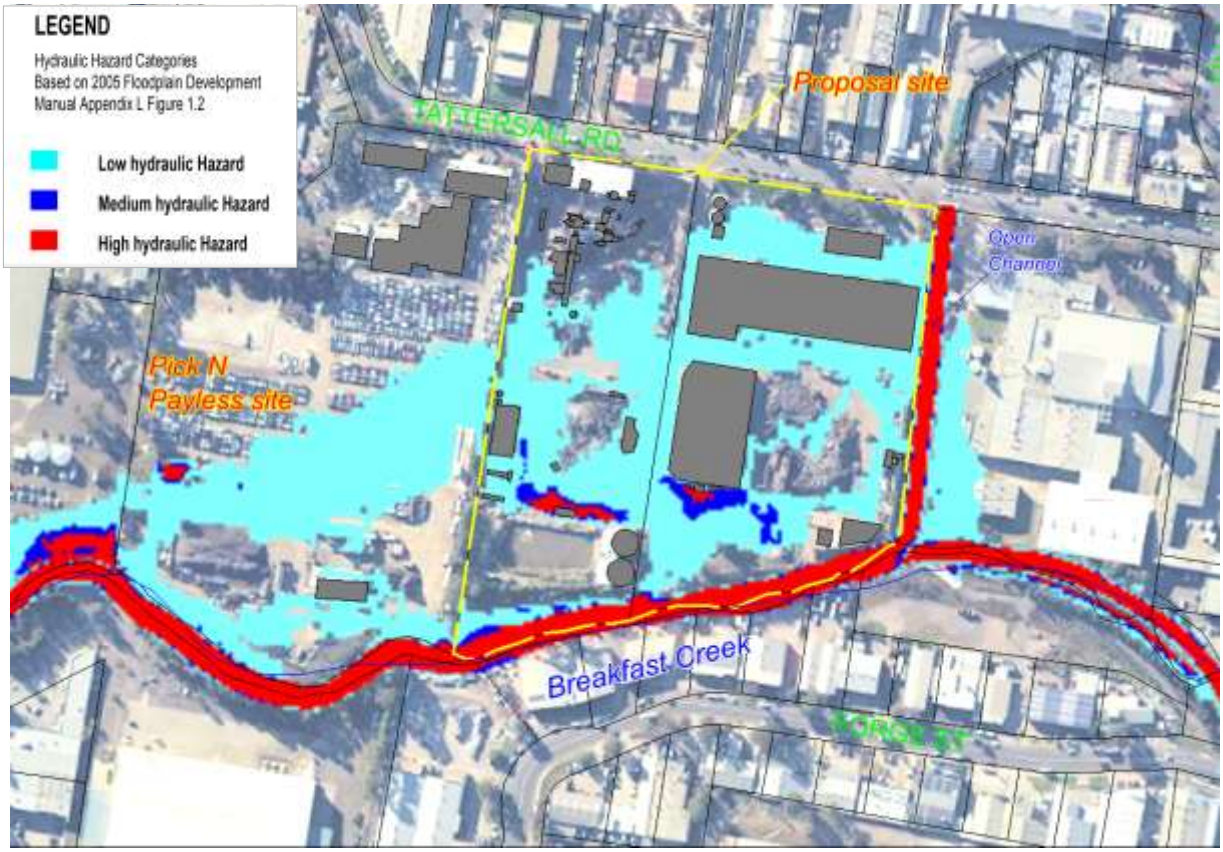

Figure 8 - Flood Hazard, 100-year ARI event

3 REVIEW OF THE PROPOSAL

3.1 Overview of the Proposal

The Proposal is to increase the scrap metal processing throughput limit at the Proposal site from 350,000 to 600,000 tpa.

The Proposal is for operational change only. The existing infrastructure at the Proposal site has the capacity to accommodate the increased throughput. The Proposal would not require any construction works and would not change the mix of materials currently received at the RRF. The Proposal would utilise existing road infrastructure, utility connections and stormwater infrastructure. However, adjustments to site management practices would be required in terms of internal vehicle movements and stacking locations to allow the increased throughput.

Under the Proposal, waste is processed through the system and the outputs are collected on as need basis. At a throughput of 600,000 tpa, the site will process waste through the system faster than the existing operations by increasing the processing rate and extending the daily operation time. The waste outputs will also be collected more frequently. As a result, stockpiles will remain the same volume, but the waste will move through the stockpiles faster.

Stockpiling on the Proposal site would be undertaken in accordance with the stockpile plan. The stockpile plan defines stockpile locations, volumes and maximum heights. Maximum stockpile heights and volumes would not change with the Proposal. The overall proposed stockpile locations would remain similar to the existing conditions.

3.2 Flood Impact Assessment

The Proposal represents a change to the current operations of the Proposal site. These operational changes are not expected to result in any changes to the existing ground conditions within the Proposal site given that:

- No construction works (e.g. ground surface regarding or construction of any structures) are proposed
- No changes to existing land use or surface treatments are proposed
- No alterations to any existing buildings (e.g. extents, floor levels, etc) are proposed
- No significant change to stockpile volumes or locations within the Proposal site are proposed.

In addition, no alterations to any existing drainage networks within or surrounding the Proposal site are proposed.

Given that no changes are required to the Proposal site that would impact the existing site conditions relevant to the flood modelling, no significant change to the existing flood regime on Proposal site is expected. As such no flood impacts on the surrounding area are predicted.

4 CONCLUSIONS

A flood assessment has been carried out to assess the flood conditions of the Proposal site. The flood assessment has revised the Council flood model to better define the existing flood regime within and immediately surrounding the Proposal site based on available information. The revised flood model results for the existing 100-year ARI flood regime are presented.

Despite the additional refinements to the Council flood model, the predicted flood regime for the 100-year ARI design flood event remains consistent with that present in the Council 2014 Council Hydraulic Assessment. As such, the flood regime for more frequent smaller flood events, and larger rarer flood events is not expected to vary significantly from that presented in Council's 2014 Council Hydraulic Assessment.

A review of the Proposal has been carried out to assess potential flood impacts. As the Proposal is an operational change only and the existing site conditions are maintained, no significant change to the existing flood regime on site is expected. As such no flood impacts on the surrounding area are predicted.

This flood assessment report provides documentation in response to the SEARs for the Proposal and demonstrates that the Proposal is not anticipated to impact the existing flood conditions within or surrounding the Proposal site.

5 REFERENCES

1. Planning Secretary's Environmental Assessment Requirements for Kings Park Metal Recovery and Recycle Facility Expansion, 19/12/2019.
2. Eastern Creek Hydraulic Assessment, Final Report Volume 1 and 2, Revision 3, November 2014. Catchment Simulation Solutions
3. Floodplain Development Manual: the management of flood liable land, 2005, NSW Department of Infrastructure, Planning and Natural Resources.
4. Blacktown Local Environmental Plan (BLEP) 2015 Maps Online (http://maps.blacktown.nsw.gov.au/)
5. 57-69 Tattersall Road, Kings Park, Flood Impact Assessment, Rev 3, March 2019, Catchment Simulation Solutions.

APPENDIX A PLANNING SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

APPENDIX B TOPOGRAPHICAL SITE SURVEY

APPENDIX C COMPARISON OF TOPOGRAPHIC SURVEY