51093-101898
51093-101898 L002 Honeysuckle (Preliminary Assessment) Rev A

20 October 2015

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Preliminary Assessment of Opportunities and Constraints for the Honeysuckle Precinct

Dear Grant,

1. Introduction

JBS&G Australia Pty Ltd (JBS&G) was commissioned by the Hunter Development Corporation (HDC, the client) to prepare a Preliminary Remedial Action Plan (PRAP) for the Honeysuckle Precinct located in Newcastle, NSW (refer to **Figure 1**). It is noted that the Honeysuckle Precinct has been subdivided into three sub-precincts with the main site (i.e. Sub-Precinct 1) incorporating the areas identified in **Figure 1** as Fig Tree Park, Throsby, Lee 5, Lee 4, Wickham Urban Village, Lee 5 South, Park Residential and Worth Place Park. Sub-Precinct 2 is a combination of Lee Wharf Stages 4 and 5, Wright Lane and Wright Lane Carpark. The Railway Infrastructure Building (RIB) site is identified as Sub-Precinct 3.

This preliminary assessment of opportunities and risks for the potential development of the Honeysuckle Precinct is the initial phase of work in the development of a PRAP and is intended to be used as the basis of future discussions related to the identification of opportunities that may be incorporated in the development plan for the Precinct.

Figure 1 – Honeysuckle Precincts (HDC, 2015)

2. Methodology

To complete this preliminary assessment, a review of historical data has been undertaken to detail each site's history, physical characteristics, contamination status (including land suitability and potential waste classification), potential re-use opportunities and constraints. A summary of data for each site is presented in **Attachment 2**.

3. Preliminary Assessment

3.1 Overall Contamination Status

The sites within the Honeysuckle Precinct have variable levels of contamination resulting from historical activities conducted at each site. Some sites are or have already been made suitable for relatively sensitive land uses (i.e. residential with minimal access to soils), while others are suitable for less sensitive uses such as open space or commercial / industrial land. In addition, some areas are subject to environment management plans (EMPs) which outline how residual contamination is to be managed in order for the site to be used for its intended purpose. Furthermore, there are sites that require remediation to make them suitable for any future use. The status of contamination for each site is detailed in the summary sheets presented in **Attachment 2**.

3.2 Constraints

Potential site-specific constraints are presented in **Attachment 2**. In general, consideration of the following must be made when identifying future development opportunities:

- View corridors;
- Local planning conditions such as restrictions on building heights and building set back requirements;
- Potential for flooding;
- Depth of groundwater and the potential presence of acid sulfate soils (particularly important in the construction phase of the potential developments);
- Heritage considerations; and
- Contamination status.

As mentioned in **Section 3.1**, some sites may require remediation to make it suitable for any land use.

3.3 Opportunities

Depending on the particular scenarios for each site (refer to **Attachment 2**), should significant excavation (i.e. for basements/carparks) be required potential opportunities for the removed material include:

- Re-use of fill material as backfill in other appropriate areas of the Precinct;
- Use of the natural materials as Virgin Excavated Natural Materials (VENM), subject to the chemical assessment for potential contaminants and acid sulfate soils;
- Use of fill material to 'reclaim' land above the water table in other areas of the Precinct and / or the potential use of the material for reclamation below the water table subject to additional testing;
- Use of the fill material as backfill for more sensitive land use scenarios, subject to an Environmental Management Plan; and
- Over excavation of the fill materials to retrieve VENM material (for use in more sensitive developments or offsite export) with the excavation to be backfilled using the fill material. It is noted that the suitability of the natural material for use as VENM will be dependent on the acid sulfate soils assessment.

In addition, there is potential to incorporate fill into a pumpable mixture suitable for stabilising old mine workings that are known to be present underneath the Precinct. As the pumpable mixture is likely to stabilise contaminants in the fill the approach would be consistent with the remediation hierarchy of 'on-site treatment of the contaminated material so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level' as referenced in *The Contaminated Sites Guidelines for the NSW Auditor Scheme* (DEC 2006). This approach would also be consistent with the Waste Avoidance and Resource Recovery Act (2001) which has the following objectives:

- To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of environmentally sustainable development (ESD);
- To ensure that resource management options are considered against a hierarchy of the following order:
    - Avoidance of unnecessary resource consumption,
    - Resource recovery (including reuse, reprocessing, recycling and energy recovery),
    - Disposal,
- To provide for the continual reduction in waste generation; and
- To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste.

This approach to waste management and re-use would also enable the stabilisation of the Precinct for future development. However, there are a number of regulatory and technical issues that would need to be addressed prior to adoption of the strategy including:

- Regulatory buy-in to the approach will be essential;
- Technical aspects of preparing the pumpable mixture may be significant and expert advice will be required to determine whether the approach is feasible;
- Currently it is unclear what the quantum of mine void is compared to the volume of fill (that requires management as part of redevelopment works); and

- While the approach may be suitable for beneath the Precinct there are potential cross boundary issues that may need to be addressed.

A summary for each site is presented in **Attachment 2**. We would welcome the opportunity to discuss the preliminary findings with HDC with the aim of identifying other opportunities and constraints for the Precinct and further refining the potential approaches for each site.

Should you require clarification, please contact the undersigned on 02 8245 0300 or by email bgomez@jbsg.com.au.

Yours sincerely:

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Reviewed/Approved by:

Greg Dasey
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Attachments:

(1) Limitations
(2) Site Summary Sheets

Attachment 1– Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Attachment 2 – Site Summary Sheets

Table 2C: Site Summary – Lee Wharf 4

Parameter	Description
SUMMARY	
Highest Current Landuse:	Based on previous investigation data, the site is not suitable for use for residential, open space or commercial / industrial purposes.
Highest Potential Landuse:	Residential with minimal opportunity for soil access (including units)
Remediation Required:	A RAP has been prepared for the site. Assuming that the stockpiles reported to be present at the site in 2007 have been appropriately removed from site, it is assumed that the volume of fill material to be excavated from the site is approximately 8900 tonnes[1]. Please note that the current RAP has not been endorsed by a Site Auditor.
Current Waste Classification:	Hazardous Waste
Potential Waste Classification:	General Solid Waste (subject to a specific immobilisation approval)
Additional Assessment Required:	• Chemical and acid sulfate soils assessment for underlying natural materials to assess suitability for use as VENM; • Should the fill materials be used for landscaping at the site, the phytotoxicity of the various contaminants within the soils should be assessed; • Leachability analysis for the potential use of fill material for reclamation below the water table; and • Analysis for the immobilisation approval, if required.
SITE STATUS	
Site Name:	Lee Wharf 4
Sub-Precinct:	1
Lot/DP:	Part Lot 2000 DP 1145678
Lot Size:	Approximately 7 644 m^2 [2]
Address:	Honeysuckle Drive, Newcastle, NSW 2300
Local Government Authority:	Newcastle City Council
Site Zoning:	B4 - Mixed Use and RE1 Public Recreation (LEP 2012[3])
Current Land Use:	Vacant land (NearMap 2015[4])
Existing Site Cover:	Bitumen or concrete (NearMap 2015)
EPA Records:	There are no records related to the site on the NSW EPA public register under the POEO Act 1997 or on the NSW EPA's public contaminated site register.
Lithology and Expected Depth of Fill Material:	As stated in the Site Audit Report (Environ 2007[5]), the site's general geological profile is as follows: • 0 to 1.0 – Fill: gravelly sand, slag and concrete; • 1.0 to 3.0 – Fill: grey to yellow sands with gravel, some clay; • 3.0 to 4.0 – Fill: Grey sand with shell fragments; and • 4.0 to 5.0 – Natural: alluvial sand or clayey sand with organic material.

1 In-situ calculation assuming a density of 1.65 kg/m^3.

2 Environ Australia (Environ) (2013), *Environmental Management Plan, Temporary Footpath Extension, Honeysuckle Precinct, Newcastle,* 11 December 2013, Ref: AS130357

3 *Newcastle Local Environmental Plan* 2012

4 NearMap Imagery dated 8 May 2015, http://maps.au.nearmap.com/

5 Environ Australia (Environ) (2007), *Site Audit Report, Remediation Action Plan, Lee 4, Honeysuckle Drive, Newcastle*, December 2007, Ref: AS120642A

Parameter	Description
Hydrology/Drainage:	Given the general bitumen/concrete surface, infiltration is expected to be limited. Surface water is likely to flow into Newcastle Harbour to the north of the site, or to the northwest into the floodway before being directed to the harbour (JBS 2007[6]).
Hydrogeology:	Groundwater is tidally influenced and was encountered at approximately 2 mbgs (Environ 2007).
Topography:	The site is less than 10 m AHD and is generally flat due to being extensively filled (JBS 2007).
Acid Sulfate Soils (ASS) / Potential Acid Sufate Soils (PASS)	Categorised as Class 3 – Development consent is required for works more than 1 m below ground surface or works by which the watertable is likely to be lowered more than 1 m below natural ground surface. There is a high probability (confidence unknown) of ASS being present at the site (ASRIS 2015[7]).
Site History:	Reclaimed land with dredged sands used to fill and raise the site for use as a wharf facility. The southern portion of the site was occupied by railway infrastructure from the mid-1950s to the mid-1970s, and partially used as a tugboat docking facility in 2002 (JBS 2007).
Contaminants of Potential Concern (COPCs):	Petroleum hydrocarbons, PAHs, heavy metals, asbestos
Maximum Depth of Previous Investigations:	5 mbgs 98% of soil samples were collected from 0-2 mbgs and 2% of soil samples were collected from >4 mbgs
Contamination Status:	A Remedial Action Plan (JBS 2007) has been developed for the site, however no remediation has been conducted. Contamination issues previously identified and summarised in Environ (2013) include PAH and manganese contamination within shallow fill soils across the site. It is also noted that soil stockpiles were present on the site. These stockpiles were assessed to be suitable for re-use on the Honeysuckle Precinct under a park / open space scenario (JBS 2008[8]). _____ In relation to the investigation and screening levels presented in the amended NEPM (NEPC 2013[9]), the following are noted: • Fill materials have concentrations of TRH F1[10], chromium and manganese above the health criteria for residential (HIL-A and B) and / or open space (HIL-C) land use. • Fill materials have concentrations of Total PAHs and B(a)P above the health criteria for commercial / industrial land use (HIL-D). • Select shallow fill samples have concentrations of chromium, copper, manganese, zinc, TRH F2[11] to F3[12], naphthalene and B(a)P above the ecological investigation or screening levels for urban residential / public open space land use scenarios and / or commercial / industrial use. • Groundwater on the site is noted to have concentrations of metals and PAHs above the adopted ecological criteria.

6 JBS Environmental (JBS) (2007), *Remedial Action Plan, Lee 4, Part Lot 230 DP 1094812, Honeysuckle Dr, Newcastle NSW 2300,* October 2007, Ref: JBS40184-11574

7 Australian Soil Resource Information System (ASRIS), http://www.asris.csiro.au/mapping/viewer.htm, viewed 30 September 2015.

8 JBS (2008), *Validation of Stockpiled Material, Lee 4 and 5, Honeysuckle Drive, Newcastle, NSW*, 21 November 2008

9 National Environment Protection Council (NEPC) 2013, *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999*, amended April 2013

10 Results for TPH C_6-C_9 were used to screen against TRH F1 fraction.

11 Results for TPH C_{10}-C_{14} were used to screen against TRH F2 fraction.

12 Results for TPH C_{15}-C_{28} and C_{29}-C_{36} were used to screen against TRH F3 fraction.

Parameter	Description
Land Use Suitability:	The Site Audit Report (Environ 2007) states that the site can be made suitable for the purposes of residential land use with minimal access to soil if the site is remediated in accordance with the RAP (JBS 2007).
Potential Waste Classification for Offsite Disposal:	Based on the Waste Classification Guidelines (2014[13]), the following are noted: • Fill material has concentrations of chromium, lead, TPH C_{10}-C_{36}, Total PAHs and B(a)P above either the criteria for General or Restricted Solid Waste (GSW and RSW, respectively) (based on no available TCLP analytical results). • Even taking into account the available TCLP results, the concentrations of Total PAHs and B(a)P are above the RSW criteria. As such, the fill material is preliminarily classified as Hazardous Waste. • It is noted that there is potential to apply for a specific immobilisation approval which could potentially enable the disposal of the waste fill material as GSW.
Potential Re-Use Opportunities:	Should the site be remediated in accordance with the 2007 RAP, the remaining fill can be re-used as backfill in areas that will be used for high-density residential or commercial / industrial developments. Subject to chemical assessment for potential contaminants and acid sulfate soils, the underlying natural material may be classified as Virgin Excavated Natural Material (VENM). In this case, the VENM material can be used as backfill on any type of proposed development site.
Limitations of Material at Surface, Below Capping Layer or Below Groundwater Table:	Fill materials will need to be remediated.
Limitations on Groundwater Use:	Groundwater is not to be used on site unless it is demonstrated to be suitable for its intended use.

[13] NSW Environment Protection Authority (EPA) (2014), *Waste Classification Guidelines Part 1: Classifying Waste*, November 2014

CONSTRAINTS	
View Corridors:	A view corridor is located immediately adjacent to the western boundary of the site and a possible view corridor is noted on the eastern boundary of the site.
Flooding:	As per the Flood Management Plan (FMP) (LT 1999[14]), the site is bound by the HWC floodway on the east and the Steel Street floodway on the west (within the Cottage Creek Precinct). These flow paths are classified as having low to medium 1% annual exceedance probability (AEP) hazards but extreme probability maximum flood (PMF) hazards. The Flood Management Plan is designed in a way such that during a major (1% AEP) flood flow, buildings will not be affected. For floods in excess of 1% AEP, it has been assumed that flooding of lower habitable floors of buildings is acceptable. Requirements for the floodways include the following: • Floodway grades should be kept low where practical; • Grades across floodway should be minimal to reduce flow concentration; • The use of floodways to provided vehicle access is accepted (subject to other Council requirements). But extended or overnight parking should be avoided; • A minimum spillway level of 1.6 m AHD has been adopted with a preferred level in the order of 2.0 m AHD, where feasible. It is noted that the HWC floodway would only operate in major floods (i.e. approaching the PMF). The 1999 plan mentions that reconstruction is required downstream of Honeysuckle Drive. It is not known if the reconstruction work has been conducted subsequent to the preparation of the plan. The Newcastle City-Wide Floodplain Risk Management Study and Plan (BMT WBM 2012[15]) notes that the planned revitalisation of the Honeysuckle Foreshore provides as opportunity to modify the lower end of Cottage Creek for better floodplain management outcomes. Cottage Creek downstream of the railway comprises a section of over channel (upstream of Honeysuckle Drive) as well as a section of covered culvert (from Honeysuckle Drive to the harbour). Both the culvert and the open channel cause local afflux in flood levels, however, flood levels on Hunter Street and further upstream are primarily controlled by the constraint imposed by the existing railway culverts. It is considered that if channel works within the lower reaches of Cottage Creek were to be managed to improve flooding, then the removal or enlargement of culverts at the railway line would also need to be addressed.
Sea Level Change:	It is noted that the Newcastle City-Wide Floodplain Risk Management Study and Plan (BMT WBM 2012) notes that the NSW Sea Level Rise Policy Statement (2009) advised that the mean sea level rise would potentially rise to 0.4 m by 2015 and up to 0.9 m by 2100, relative to 1990 levels. The projected sea level rise will increase the occurrence of flooding in the area should the site remain at its current surface levels, this is because as sea levels rise, the ability of low lying suburbs to drain via existing gravity-based stormwater systems will be minimised. It is projected that a sea level rise of 0.9 m in combination with a 1% AEP would result in inundation of numerous properties. It is also projected that as sea level rise, groundwater levels will also rise. As such, contaminants present above the current water table will have the potential to migrate vertically and laterally which may pose a risk to onsite and offsite receptors. It is noted that the Floodplain Risk Management Study and Plan suggests that these low lying areas be raised or be allowed to evolve into swampland.
Depth to Groundwater:	Approximately 2 mbgs.
ASS / PASS:	There is the potential for ASS at the site.
Heritage:	The site is outside the conservation area with no known heritage areas / items identified (LEP 2012).

[14] Lawson and Treloar Pty Ltd (LT) (1999), *Waterfront and Cottage Creek Flood Management Plan*, 2 January 1999

[15] BMT WBM (2012), *Newcastle City-Wide Floodplain Risk Management Study and Plan*, June 2012

Local Waste Disposal Options:	Summerhill Waste Management Centre – Solid waste landfill managed by the Newcastle City Council. This facility can received putrescible and non-putrescible waste. • GSW: $255/tonne • GSW – special (including asbestos): $360/tonne • VENM or ENM: $170/tonne Raymond Terrace Landfill (SITA/SUEZ) – 330 New line Road, Raymond Terrace, NSW • GSW (including asbestos in soils): $175/tonne (soils only) • GSW – special (including asbestos): $330/tonne (with ACM) Transpacific Waste Services Hazardous Waste Receiving and Treatment Facility - Kooragang Island (this facility does not take GSW and RSW). • Hazardous Waste: approximately $650/tonne
Other Waste Disposal Options[16]:	Brandown Quarry, Waste and Recycling Services – Kemps Creek, NSW. • General Recyclable Waste (density >0.6 tonne/m3): $132/tonne • General Recyclable Waste (density between 0.35 - >0.6 tonnes/m3): $200/tonne Elizabeth Drive Landfill (SITA/SUEZ) – Kemps Creek, NSW RSW: $440/tonne (up to 100 tonnes), $340/tonne (101 – 1000 tonnes), $275/tonne (1001 – 2000 tonne), $230/tonne (>2001 tonnes)
Local Planning Considerations:	• Maximum building heights are restricted to 14 – 24 m (LEP 2012). • Prescribed 2.5 m building setback.

[16] These options are greater than 150km from the site and thus, do not satisfy the Proximity Principle as stated in the Waste Guidelines. However, exemption from this requirement is available when the waste is being transported to a facility for genuine recycling (which is not offered at the nearby facility) or if no facilities within 150 km can accept this type of waste (i.e. for RSW). In the case of the latter, the waste must be transported to one of the two nearest lawful disposal facilities to the site.

OPPORTUNITIES	
Initial Assessment of Opportunities:	Following the removal of impacts above residential (HIL - B) criteria, the site can be used for residential with minimal opportunity for soil access (including units) or commercial / industrial use. Should underground levels be required by the future development following remediation work, the excavated fill material can be used as backfill for other areas of the Precinct to be used for the aforementioned land uses. If no beneficial re-use of the fill material can be identified within the Precinct post-remediation, the material will require re-classification prior to off-site disposal. Should the excavation work extend into natural soils, this material may be classified as VENM and used on and off site, subject to chemical assessment for potential contaminants and acid sulfate soils. Alternatively, the potential uses for the material post-remediation are as follows: • The fill may be used to 'reclaim' land above the water table in other areas of the Precinct. The potential exists to use this material for reclamation below the water table subject to additional testing. • The fill can be reused underneath a capping layer for more sensitive land uses, subject to an Environmental Management Plan. In addition, the site can be over excavated to retrieve VENM material (for use in more sensitive developments) with the excavation to be backfilled using the fill material. The suitability of the natural material for use as VENM will be dependent on the acid sulfate soils assessment.