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**Environment
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**Mitchel Hanlon
Consulting Pty Ltd**

**STIKS LAND
PTY LTD**

**Preliminary Site
Contamination
Report**

For proposed
Rezoning Application

502 Bridgman Rd, Wattle Ponds
SINGLETON



PRELIMINARY SITE CONTAMINATION REPORT

Stiks Land Pty Ltd

Proposed Rezoning Application – 502 Bridgman Road, Watlie Ponds

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This report does not provide a complete assessment of the environmental integrity of the site and is limited to the scope defined herein. Should any reader require that other matters be considered apart from those considered within this report, they should then make their own investigations and form their own conclusions.

This report has been prepared by:

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Stiks Land Pty Ltd

Proposed Rezoning Application – 502 Bridgman Road, Wattle Ponds

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PRELIMINARY SITE CONTAMINATION REPORT

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1. INTRODUCTION

Mitchel Hanlon Consulting has been engaged by Stiks Land Pty Ltd to carry out a Preliminary Site Contamination Report for the site located at 502 Bridgman Road, Wattle Ponds, Singleton. Figure 1 (p3) illustrates the sites location within the Singleton area.

The assessment and subsequent report is required to accompany a rezoning application for the subject site. The report is required by Singleton Council as the proposal activates State Environmental Planning Policy No. 55 – Remediation of Contaminated Lands due to the rezoning of land.

The assessment is required to conform to the requirements of Element 16 – *Mine Subsidence, Landslip, Land Contamination and Acid Sulphate Soils* of the Singleton Council's Development Control Plan and all appropriate NSW EPA and ANZECC guidelines.

Specifically this report follows the EPA guideline *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (2000). For preliminary site contamination reports, the guidelines state that the following matters are to be addressed and reported upon:-

- Issues raised in the preliminary investigation
- The type, extent and level of contamination
- Site condition;
- Assessment of site contamination; and
- The need for remediation.

The scope of work undertaken comprises:-

- Compilation of a site history covering at least the last 50 years;
- Detailed inspection of the site;
- Site sampling and analysis; and
- Preparation of this report.

The site was inspected on Wednesday the 20th October 2010 by Mr Tim McLean and Mr Michael Hooper of Mitchel Hanlon Consulting Pty Ltd.

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2. SITE DESCRIPTION

The subject site is identified as 502 Bridgman Road, Wattle Ponds, Singleton. The site is held as Lot 22 in DP 582824 and Lot 221 in DP 823112 in the Parish of Darlington, County of Durham, LGA of Singleton. The sites locally within the Singleton area is illustrated in Figure 1 (p3). The total site area is approximately 40ha with frontage to both Bridgman Road and Retreat Road [Refer to Figure 2 (4)]. The site is located on the eastern side of Bridgman Road.

The land adjoining the subject site is a mixture of developed rural residential holdings and rural land utilised for general agricultural. The land located to the north west of the site (Lot 221 in DP 816458) is currently utilised by Singleton Council as the Obanvale Water Treatment Plant (WTP).

The subject site fronts both Bridgman Road and Retreat Road and has total area of approximately 40 hectares or 98.8 acres. The front portion of the site is currently occupied by:

- Two (2) brick veneer dwellings;
- Several dams;
- Horse breaking/training related infrastructure (Dressage/show rings, Stables etc);
- Numerous corrugated iron sheds.

Both brick veneer dwellings are located towards the western boundary of Lot 22 in DP 582824. The remaining infrastructure is located to the north west, north and north east of the dwellings. All infrastructure onsite is situated within an area of approximately 4.2 ha located in the north western corner of Lot 22 in DP 582824. The site is currently zoned 1(a) Rural under the Singleton Local Environmental Plan 1996 which is owned currently and prior by Mr Keith Badior since October 1976.

Figure 2 (p4) illustrates the site locality and boundary. Plates 1-6 (p5-7) detail landscape views north, south, east and west from within the site. Figure 3 (p10) illustrates the site in an aerial photograph from 2003.

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PLATE 1: VIEW NORTH WEST OVER SITE



PLATE 2: VIEW SOUTH EAST OVER SITE

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PLATE 3: VIEW EAST OVER SITE



PLATE 4: VIEW WEST TOWARD DWELLINGS

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PLATE 5: VIEW SOUTH TOWARDS EXISTING RESIDENTIAL LAND – RETREAT ROAD



PLATE 6: VIEW NORTH OVER SITE

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3. SITE HISTORY

3.1. Information Source

The information contained within this section was provided by the following sources:

- A review of aerial photographs;
- Discussions with current owner of Lot 22 in DP 582824 and Lot 221 in 823112 – Mr & Mrs Keith Badior;
- Historical Search - Mr Mark Groll of Service First Registrations Pty Ltd;
- Discussions with adjoining land owner – Mr Lennie Cox (580 Bridgman Road) whom has lived at this address for some 77 years;
- Discussions with the proponent of the proposed development and adjoining landowner (722 Bridgman Road) – Mr Dwight Geeelan;
- A review of survey plans; and
- Title search information sourced from ACS Search [Refer to Appendix A].

3.2. Property Ownership

Lot 22 in DP 582824 and Lot 221 in DP 823112 have been owned by Mr and Mrs Keith Badior since October 1976 and May 1993 respectively. The lot formed part of a larger block of land, which incorporated the subject site and the adjoining lots to the north (Lots 11 and 12 in DP 603197).

The site history of ownership for the past 89 years is presented in the below table.

TABLE 1: PREVIOUS OWNERSHIP RECORD FOR LOT 22 IN DP 582824

Reference to Title	Owner	Year (from)	Year (to)
Vol 3256 Fol 6	Frederick Cox	1921	1932
Vol 3256 Fol 6	Lilian Cox	1932	1960
Vol 3256 Fol 6 now	Richard Cox	1960	1976
Vol 13074 Fol 25 now 22/582824	Keith and Judith Badior	1976	Current

TABLE 2: PREVIOUS OWNERSHIP RECORD FOR LOT 221 IN DP 823112

Reference to Title	Owner	Year (from)	Year (to)
–	State of New South Wales	–	1993
221/823112	Keith and Judith Badior	1993	Current

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3.3. Prior Chemical Usage

Mr Badior has advised us that, with the exception of ‘Roundup’ (Glyphosate) no chemicals have been used onsite during his ownership. It was noted that the Glyphosate is stored onsite in small quantities (approximately 20L) and is only utilised for targeted use during weed control

3.4. Prior Fuel Storage

Mr Badior has advised us that, with the exception of a small quantity (approximately 20 Litres) of fuel for use in lawn care and farm maintenance equipment etc, no substantial quantities of fuel have been used onsite during his ownership.

3.5. Landuse

3.5.1. Current Landuse

Presently the site is utilised for the grazing of approximately 30 horses and numerous sheep. The north western portion of the site is utilised to store scrap material and other refuse material as described below:-

- Scrap material (empty pressed metal drums, concrete stormwater pipes, scrap metal etc),
- Derelict vehicles (car bodies, motorbikes, trailers, lawnmowers etc);
- Fencing material (strainer posts etc); and
- Refuse piles containing house hold waste etc.

3.5.2. Historical Landuse

Discussions with Mr Lennie Cox; Mr Dwight Geelan and Mr Keith Badior have revealed that the site has an extensive history (>70yrs) being utilised to graze cattle, sheep and horses. Mr Cox recalls the site being utilised as a dry paddock for dairy cows. Dairy facilities may have also existed prior to 1900 but are unconfirmed. Mr Cox indicated that the site contained a number of dwellings previous to the current ownership, these dwelling were demolished and new dwellings built by Mr Keith Badior.

3.5.3. Adjoining Landuses

It is noted that, with the exception of the WTP located to the north west of the site [Refer to Figure 2 (p4)], the predominant adjoining land use is a mixture of rural and rural residential land uses. The rural land located to the north of the site is currently utilised as grazing land for cattle and sheep.

Mr Geelan and Mr Badior have informed us that when the WTP is ‘flushed’ excess filter water migrates onto the subject site. This excess water is captured by a small dam (Farm Dam 1) located in the north western corner of the site [Refer to Figure 3 (p10)].

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4. SITE INVESTIGATION

The site was visited on the 20th of October 2010 by Mr Tim McLean and Mr Michael Hooper of Mitchel Hanlon Consulting for a site investigation and preliminary site sampling program.

The site investigation consisted of the visual inspection of soils around the brick dwellings; associated corrugated iron shedding, refuse/scrap piles and associated areas. A random walk throughout the remainder of the property was also carried out with attention given to boundary areas close to neighbouring properties and any unnatural depressions or bare earth areas.

Significant aspects of the investigation are detailed below:-

- No visible signs of spills or leaks outside the brick dwellings;
- No obvious odours outside the structures or within the site boundaries;
- Several large areas of scrap material (empty pressed metal drums, concrete stormwater pipes, scrap metal etc), derelict vehicles and machinery (car bodies, motorbikes, trailers, lawnmowers etc), fencing material (strainer posts etc) and refuse piles containing house hold waste etc [Refer to Figure 5 (p13) and Plates 8, 9 and 10 (p16 – 17)].
- Several felled trees located in the south western creek line (the current owner has utilised these to try and reduce stormwater velocity and limit erosion within the creek line) [Refer to Figure 5 (p13) and Plate 13, p20].
- Several empty pressed metal drums (utilised for 'Barrel Racing') scattered throughout the site;
- Numerous water storage dams;
- No obvious visible signs of any reaction to toxic contaminants;
- No visible on-site losses of dangerous goods or discarding of explosive materials;
- Established vegetation (trees and shrubs) appeared healthy
- A large open liquid container containing a dry black lining of material which has the odour of road tar emulsion. The container is located to the south west of the 'show ring' [Refer to Figure 5 (p13) and Plate 7 (p16)].
- Exotic grasses and weeds extensively covered the site; and
- The grassland vegetation onsite is well established but reflected stress from excessive livestock grazing



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A 01/11/2010 INITIAL ISSUE		REVISIONS: _____ H.C. APPR: _____		TURKEY/DESIGN FILE: _____											

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5. POTENTIAL FOR CONTAMINATION

5.1. Introduction

Following the preliminary site investigation and assessment it has been determined the site has potential for minimal contamination given the current activities that occur onsite.

5.2. Chemical Storage

The use of the non selective herbicide *Glyphosate* or ‘*Roundup*’ should pose no potential contamination risk to the site. Applications of *Glyphosate* have been applied at the correct label rate using appropriate equipment and stored as required according to the Material Safety Data Sheet (MSDS). *Glyphosate* does not bioaccumulate and is highly susceptible (87.7%) to degradation in water after 30 days (www.scottsaustralia.com.au/images/MSDS/199510Roundup_Xtra_Conc._1022_.pdf).

No evidence was present onsite suggesting a significant quantity of chemical has been stored other than what has already been detailed earlier in the report of a 20L drum of *Glyphosate*.

5.3. Fuel Storage

No evidence is present that would suggest bulk quantities of fuel have been stored on the site. No onsite fuel storage infrastructure, such as underground or aboveground fuel tanks were observed during the site inspection.

5.4. Empty Oil/Chemical Drums

During the site inspection it was noted that the grazing paddock (approximately 80 acres) contained several empty pressed metal oil drums and a large plastic chemical drum, the area surrounding these drums was inspected and no obvious signs of leaks and/or spills were observed.

5.5. Refuse Piles

It was noted during the site inspection that the site contained several areas of refuse material. These areas were located to the north west of the existing dwellings and to the west of the dressage/show ring [Refer to Figure 5 (p13)]. The areas contained a large amount of material that could not be identified as it was inaccessible due to the quantity of material present. From what was visible and accessible, the refuse piles appeared to contain:

- Scrap metal;
- Vehicle (car and truck) bodies;
- Derelict (inoperable) vehicles and lawn care equipment
- Fencing material;
- Agricultural Machinery, parts and equipment; and
- Domestic household waste.

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It has been determined that these areas pose a moderate contamination risk, as the areas could not be fully explored. These areas of concern are located entirely within the front 8.1 hectares of the site and are therefore not expected to impact upon the remaining development area.

5.6. Water Treatment Plant Overflow

The Obanvale Water Treatment Plant (WTP) is located to the north west of the site [Refer to Plate 11 (p18)]. Topographic mapping indicates ephemeral drainage flows adjacent to the WTP effluent ponds. The drainage line continues through the WTP site, under Bridgman Road, through two (2) small farm dams (Farm Dams 1 & 2) before traversing the development site, [Refer to Plate 12 (p18)].

After discussions with the current owners and surrounding land owners, it has been determined that the only time the drainage line contains water is during the WTP ‘flushing’ process as well as periods of heavy rainfall.

The Obanvale WTP is Singleton’s primary water treatment facility. The facility sources raw water from Glennies Creek Dam and treats the raw water onsite before being distributed throughout Singleton via a dedicated reticulated network.

The ‘water’ released during the ‘flushing’ process consists of rejected water that is deemed to be unsuitable for human consumption.

The drainage line was sampled in a series of locations within the proposed development site. These soil samples were sent for laboratory analysis to determine the presence heavy metals.

5.7. Landuse

Based upon the known current and historical land uses i.e. general grazing of sheep and horses, it is deemed that the site has minimal likelihood of being contaminated via improper land use practices.

5.8. Soil Contamination

A review of the recent site history has revealed activities that may have potentially resulted in soil contamination of the site. The areas within the site that would appear to have the greatest risk of contamination are the dam containing the runoff from the WTP located in north western corner of the site and the area adjacent to the dressage/show ring (location of a large quantities of refuse material and scrap metal).

A visual inspection of the area containing the refuse material failed to reveal any obvious signs of contamination associated with the onsite presence of the refuse material. However it was not possible to fully explore the refuse piles or the ground beneath.

Based upon the known uses that have occurred within the proposed development site, it is unlikely that the site has been contaminated by agricultural products caused by the potential improper handling, storage or use of pesticides etc.

The possibility of soil contamination due to spills / leakages or over application of chemicals is minimal, as the current owner have informed us that with the exception of the glyphosate, there has not been any other chemical applied nor has there been any significant quantity of chemical stored on the site during Mr Badiours ownership.

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PLATE 7: VIEW LARGE OPEN CHEMICAL CONTAINER



PLATE 8: VIEW OF AREA CONTAINING REFUSE MATERIAL

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PLATE 9: VIEW OF AREA CONTAINING REFUSE MATERIAL



PLATE 10: VIEW OF AREA CONTAINING REFUSE MATERIAL

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PLATE 11: VIEW OF TOWARDS OBANVALE WTP AND FARM DAM 1



PLATE 12: VIEW OF FARM DAM 1 LOCATED IN THE NORTH WESTERN CORNER OF THE SITE

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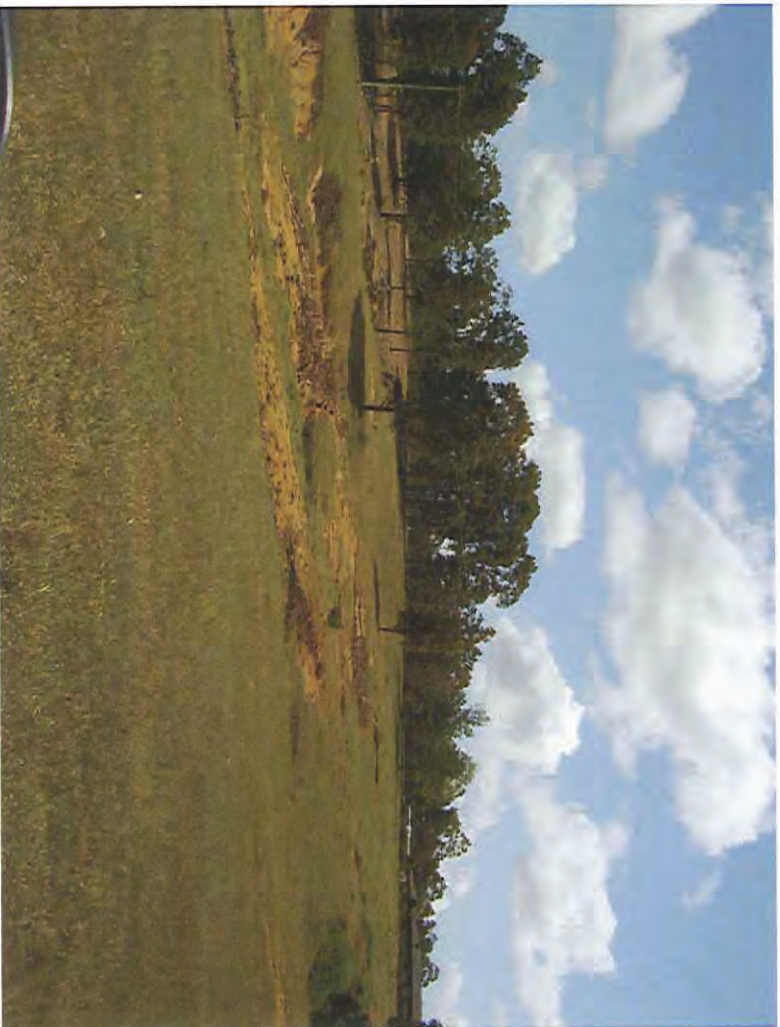


PLATE 13: VIEW OF AREA CONTAINING FELLED TREES

6. SITE SOIL TESTING

To supplement the obtained site history, a series of soil tests were taken from within the site, these samples were sent for analysis by a NATA accredited laboratory to determine the existence/presence of any heavy metal and/or pesticide contamination associated with an extensive history of agricultural land use as well as to determine if the water expelled from the WTP has contaminated the site.

As such twenty (20) test pits were excavated throughout the site [Refer to Figure 4 (p12)]. The pits were approximately 0.2 metres deep. A soil sample was obtained for laboratory testing from each test pit. The samples were forwarded to Australian Laboratory Services (ALS) for testing in the following parameters:

- Organochlorides and Organophosphates (OC's & OP's);
- Heavy Metals; and
- Soil Acidity and Salinity (pH and E_c).

Samples (TP1 – TP4) were taken from within the ephemeral creek line which traverses the site and another sample (TP12) was obtained from the drainage line located towards the south western boundary. These samples were obtained to determine if contamination had been spread due to overland water flows during rainfall events. If these samples are found to contain contamination we will be able to determine the extent of the contamination in the creek line by comparing the subsequent results.

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The remaining sample locations were randomly selected from within the boundaries of the subject site.

A summary of each soil sample is shown in Table 3 (p20).

TABLE 3: SAMPLING SUMMARY

Sample ID	ALS Sample ID	Test Depth (m)
TP1	ES1021250-001	0.0 – 0.2
TP2	ES1021250-002	0.0 – 0.2
TP3	ES1021250-003	0.0 – 0.2
TP4	ES1021250-004	0.0 – 0.2
TP5	ES1021250-005	0.0 – 0.2
TP6	ES1021250-006	0.0 – 0.2
TP7	ES1021250-007	0.0 – 0.2
TP8	ES1021250-008	0.0 – 0.2
TP9	ES1021250-009	0.0 – 0.2
TP10	ES1021250-010	0.0 – 0.2
TP11	ES1021250-011	0.0 – 0.2
TP12	ES1021250-012	0.0 – 0.2
TP13	ES1021250-013	0.0 – 0.2
TP14	ES1021250-014	0.0 – 0.2
TP15	ES1021250-015	0.0 – 0.2
TP16	ES1021250-016	0.0 – 0.2
TP17	ES1021250-017	0.0 – 0.2
TP18	ES1021250-018	0.0 – 0.2
TP19	ES1021250-019	0.0 – 0.2
TP20	ES1021250-020	0.0 – 0.2

7. TEST RESULTS COMMENTARY

Twenty (20) soil samples were obtained from the site at 502 Bridgman Road, Wattle Ponds and subsequently set for analysis by ALS. The full laboratory test report can be found in Appendix B.

Soil sample test results registered detectable concentrations of heavy metals but none exceeded the current guidelines for residential or sensitive land use as outlined by the National Environmental Health Forum – *Health Based Soil Investigation Levels* (Commonwealth of Australia 2001). None of the soil samples contained detectable levels of Organo-chlorides or Organophosphates.

In addition to OC/OP's and Heavy Metals the samples was also tested for pH and Electrical Conductivity (E_c) (Salinity). Applying the soil conversion factor for sandy loam soils of 14 (Charman & Murphy, 2000:241), the results obtained indicate that, with the exception of TP2, the soil falls into the non-saline category. TP2 reflects moderate to high salinity. Further investigation is required to determine whether the cause of salinity is either primary or secondary salinity.

Optimal pH for most plants is from 5 - 7. The results obtained indicate the average soil pH is 4.75 with 4.0 being the minimum and 6.4 the maximum. Further investigation is required to determine whether the average soil pH occurs naturally or is “induced acidification which involves changes to the nitrogen and carbon cycles, and the accumulation, depletion and transport of acids and bases” (Helyar & Porter 1989, p24).

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8. RECOMMENDATIONS

The soil test results obtained indicate the site contains detectable concentrations of heavy metals however none of the obtained results exceed the recommended assessment criteria for sensitive or 'standard residential land use criteria (NEHF). The results also indicated that none of the samples contained Organo-chlorides or Organophosphates. Based upon the historical title search and the sampling regime undertaken, the site is considered to be suitable for the proposed activity.

It is therefore recommended that the development should be allowed to proceed as proposed and that no further investigation is required.

9. CONCLUSIONS

Twenty (20) soil samples were obtained from the site at 503 Bridgman Road, Wattle Ponds and analysed by ALS. The full laboratory test report can be found in Appendix B.

The soil removed from all test pits contained detectable soil concentrations of heavy metals however no detectable concentrations of OC/OP were observed within any of the samples. An analysis of the results obtained for all samples, indicates that all heavy metal concentrations are within the guidelines for sensitive land uses and for 'Standard' residential land use as set by the National Environmental Health Forum – *Health Based Soil Investigation Levels*.

In addition to OC/OP's and Heavy Metals the site was also tested for pH and Electrical Conductivity (E_c) (Salinity). The soil test results indicate the average soil pH across the subject site is 4.75. Soils with a pH (<4) are considered saline and have toxic amounts of Aluminium and Manganese (Helyar & Porter 1989). Whilst the average pH may limit agricultural production activity it is unlikely to impact on the proposed rural / residential development.

Soil test results support the visual appearance of the soil landscape on site, appearing without scalding, depression and surface contamination. It is the opinion of Mitchel Hanlon Consulting based on soil test results and onsite investigation that 503 Bridgman Road, Wattle Ponds is unlikely to contain concentrations of Heavy Metals or OC/OP's exceeding relevant guideline thresholds and is assessed as suitable for the proposed rezoning of the subject site.

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10. REPORT LIMITATIONS

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only.

This report has been prepared in accordance with the requirements of Council's *Contaminated Land Policy 1999* and appropriate NSW EPA and ANZECC guidelines and in particular section 3.5.1 Stage 1 – Preliminary Investigation of the NSW EPA 'Planning Guidelines SEPP 55 – Remediation of Land'. Specifically this report follows the EPA guideline *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (2000).

The findings and recommendations made in this report are based upon the results of the 'random' sampling regime carried out within the site boundaries. This sampling regime was adopted due to the size of the development site and the subsequent cost of testing and was carried out in accordance with guidelines.

11. REFERENCES

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