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Report on
Stage 2 Contamination Assessment

Proposed Northbank Enterprise Hub
Lot 1001 DP 1127780, 365 Tomago Road
Tomago

Prepared for
ADW Johnson Pty Ltd
on Behalf of
Northbank Enterprise Hub

Project 49608.01
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
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Executive Summary

This report presents the results of a Stage 2 contamination assessment for the proposed Northbank Enterprise Hub industrial subdivision project at Tomago. The work was carried out for ADW Johnson Pty Ltd on behalf of Northbank Enterprise Hub. The purpose of the assessment was to address the following NSW Department of Planning & Infrastructure requirements:

- Assessment of the nature and extent of soil and water contamination at the site;
- Assessment of the risk to the environment and human health posed by contamination;
- Recommendations for remediation of contamination if required;
- Assessment of acid sulphate soils; and
- Preparation of a conceptual hydrogeological model of the site.

The investigation comprised review of preliminary studies, sub-surface investigations (boreholes and test pits), installation of groundwater monitoring wells and water level loggers. Soil, groundwater and surface water samples were collected for chemical laboratory testing.

Geotechnical and hydrogeological models were developed for the site. The groundwater system comprises an unconfined aquifer in the upper strata, a semi-confining layer (leaky aquitard) of low-permeability clay and silty clay, overlying a semi-confined sand aquifer which responds to changes in head in the river.

The results of soil contamination testing were generally below the adopted relevant landuse criteria, with the exception of localised occurrences of asbestos, petroleum hydrocarbons and polycyclic aromatic hydrocarbons.

The results of groundwater testing provided a snapshot of background water quality. The results indicated prevalent exceedances of the adopted ANZECC trigger values for pH, total phosphorus, ammonia, total nitrogen, NO_X and metals. Elevated fluoride levels were also recorded but there are no ANZECC criteria for fluoride. The results for other compounds were generally within the adopted ANZECC trigger values, where criteria are given. The results indicate little or no off-site impact.

The results of surface water testing indicated prevalent exceedances of the adopted ANZECC trigger values for pH, total phosphorus, total nitrogen, NO_X and metals. Elevated fluoride levels were also recorded but there are no ANZECC criteria for fluoride. The results for other compounds were generally within the adopted ANZECC trigger values, where criteria are given.

Localised remediation of soils will be required to address the localised presence of hydrocarbon and asbestos contamination, including removal of remnant effluent disposal systems and structures. This can be readily undertaken in conjunction with construction activities, and a Remediation Action Plan (RAP) should be prepared to set out remediation procedures and clean-up criteria.

The site contains potential acid sulphate soils, which could potentially be disturbed by the construction of drains, ponds and services or by dewatering. An Acid Sulphate Soil Management Plan (ASSMP) will be prepared during the detailed design process for each stage of development.

It is assessed that the site is suitable for the proposed industrial development, subject to localised remediation (to be detailed in an RAP) and suitable management of surface water and groundwater.

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1. Introduction

1.1 Overview

This report presents the findings of a Stage 2 Contamination Assessment for the proposed Northbank Enterprise Hub, Tomago Road, Tomago, New South Wales. The assessment was carried out at the request of Mr Craig Marler of ADW Johnson Pty Ltd (ADW) on behalf of Northbank Enterprise Hub Pty Ltd with reference to our proposal NCL110238 Rev 2 dated 17 June 2011.

It is understood that the site is proposed to be developed for industrial / commercial purposes and part of the site will need to be raised using imported fill materials.

It is further understood that the site is currently zoned IN1 General Industrial under the provisions of SEPP (Major Development) 2005. The current zoning encourages industrial development to proceed.

The Stage 2 Contamination Assessment was undertaken to assess potential contamination sources identified in Douglas Partners Pty Ltd (DP) preliminary contamination assessment (PCA) conducted in late 2010 (Ref 11).

The assessment was undertaken with reference to NSW EPA “Guidelines for Consultants Reporting on Contaminated Sites” (Ref 21).

The assessment included the following tasks:

- Application for and receipt of a bore license from the NSW Office of Water for groundwater wells;
- Review of previous relevant studies for the site and immediate surrounds;
- Site walkover inspection by an experienced environmental engineer;
- Clearance of pertinent test locations for underground services and unexploded ordinances (UXO) by a professional service locator / registered UXO clearance professional prior to field work;
- Field sampling and testing at 141 locations, comprising test bores, test pits, groundwater sampling, surface water sampling and automatic logging of water level data;
- Chemical testing of selected soil and water samples for potential contaminants;
- Acid sulphate screening tests and detailed testing of selected soil samples for the assessment of acid sulphate soil conditions;
- Preparation of this report, which present the results of the Stage 2 assessment including recommendations for remediation and a conceptual hydrogeological model of the site.

For the purposes of the assessment ADW supplied the following:

- A survey plan of the site showing surveyed test locations conducted by DP (ADW Ref 37672-BH-001-B, dated 25 August 2011);
- Copy of EJE Heritage, Heritage Assessment and Statement of Heritage Impact report (Ref 12);
- A copy of the proposed Northbank Masterplan layout (Ref N21618 dated 11 June 2011).

It is noted that DP and ADW requested monitoring data from Tomago Aluminium to assist with the current assessment. Unfortunately the data had not been provided at the time of preparing this report.

1.2 Site Identification

The site is identified as Lot 1001 DP 1127780, 365 Tomago Road, Tomago, New South Wales, and is shown in Drawing 1, Appendix D, and herein referred to as the Site.

The site has an eastern frontage of about 1300 m to Tomago Road, and comprises an irregular shaped area of about 241 ha.

1.3 Proposed Development

Northbank Enterprise Hub is a proposed industrial subdivision. The main features of the proposed development are:

- Filling of the majority of the site to surface levels above the 1:100 flood levels. The design finished surface level of the fill platform is expected to be about RL 2.4 to 3.4 AHD, therefore requiring about 2 m to 3 m depth of fill;
- Stormwater management ponds to be located in the southern part of the site, adjacent to the Hunter River (North Arm); these areas will not be filled;
- Construction of a low permeability perimeter berm, creating an open drain with invert level on natural surface level, running the full length of the common boundary between the subject site (Lot 1001) and adjacent 'environment conservation' zone to the south-east (Lot 1002);
- Construction of internal open channel drains between allotments;
- Construction of internal roads to service the allotments.

The site will require a substantial amount of fill material to raise the ground to the design levels. The source of fill material has not yet been determined.

1.4 Objectives of Assessment

The NSW Department of Planning & Infrastructure (DPI) outlined the requirements for the Environmental Assessment of the project in correspondence dated 31 March 2011, which included comments received from the NSW Office of Water (NOW) and the Department of Environment, Climate Change and Water (DECCW, now OEH).

This Stage 2 contamination assessment addresses specific matters related to the contamination status of soil, groundwater and surface water, and hydrogeological conditions at the project site. These matters are:

- Assessment of the nature and extent of soil and water contamination at the Site;
- Assessment of the risk to the environment and human health posed by contamination;
- Recommendations for remediation of contamination if required;
- Assessment of acid sulphate soils; and
- Preparation of a conceptual hydrogeological model of the site, including groundwater contour plan.

The field work programme was devised to characterise the geo-chemical nature of soil, groundwater and surface water at the Site, so that if required, appropriate mitigation measures can be put in place to effectively manage site contamination and protect on-site and off-site receptors (i.e. Hunter River, wetlands and adjacent sites). Section 2 provides further information on the environmental values requiring protection.

The scope of the assessment has been devised with reference to the seven step data quality objective process, as defined in NSW DEC *Guidelines for the NSW Site Auditor Scheme (2nd Edition)* (Ref 18). The Data Quality Objectives (DQOs) are presented in Section 7.

The field work also included measurement of water table levels and soil properties so that the hydrogeological model of the site could be developed. This will enable impacts associated with groundwater levels and drainage to be assessed and suitably managed.

2. Values Requiring Protection

2.1 Environmental

The environmental values that require protection during and following construction of the Northbank Project are as follows:

- SEPP 14 wetlands located to the east, adjacent to the Site;
- Ramsar listed Hunter Estuary Wetlands, located to the east of the SEPP 14 wetlands;
- The Hunter River (North Arm) located adjacent to the south-western part of the Site.

The potential risk to these environmental receptors is in the form of contaminant and / or sediment migration through surface water and groundwater movements from the developed site.

2.2 Human Health

Human health will require protection during construction of the Northbank project and subsequently during operation of the industrial subdivision. The main modes of protection will be:

- Construction: remediation of local contamination 'hot spots' prior to construction; or where contamination is to be managed on site, minimisation of exposure of workers to residual contaminants (usually through implementation of an environmental management plan);
- Operation: prevention of access to contaminants by humans (where present) through filling and capping of the site.

This contamination assessment does not need to directly assess protection of human health as the protection will be provided by the above measures.

3. Background Information

3.1 Preliminary Contamination Assessment

A Preliminary Contamination Assessment (PCA) for the site was previously conducted by DP for ADW on behalf of Northbank Enterprise Hub Pty in December 2010 (Ref 11).

The PCA was undertaken to assess past and present contaminating activities, report on site conditions, and provide a preliminary assessment of site contamination.

The PCA comprised the following tasks:

- A review of site history comprising:
- Records search (PSC, NSW DECCW, NSW WorkCover);
- Historical aerial photo review;
- Historical title deed search;
- A review of previous reports held in-house by DP;
- Site visits on 2 and 5 July 2010;
- Discussions with Tomago Aluminium's Environmental Manager;
- Surface water sampling at selected locations over the site;
- Preparation of a report presenting the findings of the preliminary assessment.

A summary of the pertinent findings from the site history review is as follows:

- The site is currently zoned IN1 General Industrial under the provisions of SEPP (Major Development) 2005;
- Lot 1001 DP 1127780 was agglomerated from the following nine allotments in March 2003:
    - Lots 151 to 153 DP 625755;

  - Lots 4, 6, 7 and 8 DP 37876;
  - Lot 11 DP 774442;
  - Lot 52 DP 577334.

- The majority of the nine allotments were predominantly owned by various farmers to the early to mid 1980s;
- All nine allotments were subsequently purchased by Tomago Aluminium Company Pty Ltd between 1982 and 1992 and by the State Property Authority (formerly Crown Property) in 2003 at which time the lots were agglomerated;
- In April 2009 Hunter Development Corporation became the registered proprietor for the property (Lot 1001 DP 1127780), who subsequently sold the property to Northbank Enterprise Hub Pty Ltd (formerly WEPL Investments Pty Ltd) in March 2010;
- Industrial / commercial properties are located up-gradient of the subject site, including the former Genkem Pty Ltd property (now MinMet Operations Pty Limited (Chemical Manufacturers)), Tomago Aluminium and a scrap metal yard;
- The property is located within the Tomago Aluminium Smelter Buffer Zone;
- The site has no statutory notices issued under the provision of the Contaminated Land and Management Act, however, the former Genkem Pty Ltd site had a notice requiring a comprehensive investigation of the site and surrounding environment including soil and groundwater to determine the extent of Lead and Chromium contamination;
- Investigations conducted by DP at the Genkem property identified an approximate 2000 m^2 contaminant plume up to 15 m deep heading south towards School Road. Groundwater testing in 1993 indicated elevated sulphate, lead and iron migrating off-site at approximately 5 m to 10 m per year. Additional testing in 1994 indicated groundwater concentrations had diluted and were within the then current guidelines;
- No licences to keep dangerous goods were identified through NSW WorkCover for the site;
- Prior to purchase of the site by Tomago Aluminium it is understood the site was predominantly used as dairy farms and commercial grass production (Buffalo grass). The site may have also previously had orchards;
- The Dairies comprised milking sheds and associated infrastructure in the northern portion of the site to the east and west of Tomago House;
- Timber weirs were originally utilised by the farmers on-site to restrict salt water intrusion from the drainage network on-site. The drain entrances to the Hunter River were re-aligned with drainage pipes installed with control mechanisms in place to minimise salt water intrusion from the river;
- Tomago Aluminium was required to purchase the site and surrounding rural / residential properties within the buffer zone for the smelter;
- Sulphur dioxide and fluoride are the two chemicals of concern emitted from the plant. While the emissions have a low-risk to human health, the fluoride concentration can impact on plant growth and stock eating the vegetation;
- Vegetation sampling was therefore particularly important during previous dairy operations due to concern for fluoride concentrations in forage eaten by dairy cattle;

- Due to prevailing winds in the area, the monitoring station on the site records some of the highest concentrations of fluoride from the Tomago Aluminium monitoring network;
- A review of historic aerial photos indicated the following:
  - The site comprised rural land with a network of drains / creeks which largely connect to the Hunter River;
  - The site comprised numerous houses, sheds and a small church;
  - Gun emplacements and ammunition bunkers were evident in the south eastern portion of the site;
  - Transmission towers / easement traverse the northern portion of the site;
  - Cropping occurred across low-lying areas of the site;
  - Demolition of site structures was evident from the 1970s, around the time when commercial / industrial development of adjacent properties began.

A detailed site condition was provided for accessible areas of the site and generally indicated the following:

- Site slopes are relatively flat and generally less than 1° to 2°with the exception of some localised steeper batter slopes ;
- The site comprises a series of open, unlined drains / creeks. A number of the drains contained stockpiled spoil adjacent to the drain suggesting the material had been excavated during construction or maintenance of the drain. The drainage network appeared to flow to the Hunter River discharging at two points on the western site boundary and into the adjoining scrap metal yard in the north-western portion of the site;
- Lower lying areas of the site were generally saturated at the time of the inspection;
- Vegetation generally comprised a dense, lush grass or reed cover across the majority of the site, with some mature trees at former residential areas of the site and some scattered trees and areas of scrub, generally along drainage paths. Reeds were generally located within lower saturated areas of the site;
- A few access tracks have been formed across the site. Granular fill comprising gravels, crushed aggregate, ash, coal reject and railway ballast is evident at the surface of the tracks. Ponded surface water within rutting in areas where ash filling was evident comprised localised surface sheen (possible hydrocarbon related);
- A number of current and former buildings / sheds / structures were observed across the site including four unoccupied residential dwellings and associated sheds / garages, a number of former residential dwellings, sheds and / or structures, ammunition bunkers, gun emplacements, sunken command centre, electrical transmission lines and associated towers, some circular and rectangular concrete troughs;
- A number of potential contaminant sources were identified in the vicinity of these structures including fibro sheeting fragments (possibly asbestos), former effluent disposal systems including septic tanks, former driveways and pavements comprising fill materials (including ash), fill materials including fill stockpiles some of which contained visible ash or fibro sheeting materials, paint residue and flakes, burnt refuse and small quantities of white substance;

- Surrounding land uses comprise Industrial development including scrap metal yard to the west of the site, industrial sheds to the east of the site, Tomago House immediately adjacent to the northern portion of the site, land approved for the development of a WesTrac facility, industrial subdivision and bulk earthworks on the adjoining land to the north east, Tomago Road and adjacent industrial and residential development to the north of the site, undeveloped rural and nature reserves to the east and south of the site.

Based on the available site history information and observations made during the site inspection, the principal sources of potential contamination identified in the PCA were considered to be:

On-site

- Imported fill materials;
- Demolition waste including fibro sheeting fragments and paint residues / flakes;
- Former buildings / sheds / structures;
- Possibly former WWII gun emplacements and associated infrastructure;
- Former cropping;
- Former dairy farming activities;
- Former agricultural practices (i.e. clearing / ploughing) and construction of drainage networks across the site;
- Former on-site wastewater disposal systems.

Off-site

- Tomago Aluminium;
- Up-gradient industrial subdivisions, including the former Genkem site, adjacent scrap metal yard and other industrial sites which have on-site septic systems.

The results of surface water monitoring indicated surface waters within the site were generally neutral to moderately acidic and fresh to slightly brackish. Surface waters tested from the Hunter River were generally slightly basic and saline.

The results of the PCA suggested the following with respect to potential contamination at the site:

- No indicators of widespread gross contamination were identified at the site;
- A number of potential contaminant sources / activities have been identified on-site and off-site, which may have resulted in impact to the site;
- The majority of these potential contaminants sources are localised and likely to be readily remediated using standard remedial practices.

The PCA identified the requirement for an additional targeted contamination assessment to investigate the potential contaminant sources identified in the PCA and confirm remediation requirements to render the site suitable for the proposed industrial development.

3.2 Investigations for Austeel

Lots 1001 and 1002 were investigated in 2001 by Soil and Rock Engineering Pty Ltd for a proposed steel mill development (Austeel Mill) on behalf of the NSW Premier's Department. Geotechnical investigations were carried out at the site in stages and the results presented in two reports (Refs 24 and 25).

The investigations were primarily geotechnical and comprised test bores, cone penetration tests, test pits and laboratory tests. Limited chemical testing was undertaken on soil and water samples, to assess aggressiveness and acid sulphate soils. No testing for contamination was undertaken.

The type and number of tests undertaken are summarised in Table 1 below.

Table 1: Subsurface Test Data

Test Type	Total Number of Tests	Range of Termination Depths (m)	Comment
Borehole	25	20.7– 81.25	Fair to good quality data on stratification plus the benefit of disturbed and undisturbed soil samples.
CPT (1)	135	5.7 – 60.0	Very good quality data on stratification, including the strength, thickness and layering of soils to some depth.
Test Pit	50	1.0 – 3.5	Provides visual confirmation of soil conditions and samples within the upper few metres of soil.

Notes to Table 1:

1. CPT = cone penetration test (including piezocone tests where undertaken)

Despite the large number of tests, the test density is relatively sparse due to the size of the site. Furthermore the tests were more concentrated in the northern parts of the site.

These results have been used, in conjunction with the current investigation tests, to assist in the development of the geotechnical and hydrogeological models of the site. These models are relevant to the assessment of contamination potential, migration pathways and groundwater flows.

3.3 Heritage Assessment

A Heritage Assessment and Statement of Heritage Impact report produced by EJE Heritage (Ref 12) for the site was provided by ADW for the purposes of this assessment.

The pertinent historical information from the report, not already identified in DP PCA (Ref 11), is summarised below:

- The site is located within parts of Lots 7 and 10, acquired by barrister Richard Windeyer in the late 1830s;
- A 30 acres vineyard was established in 1839 and Tomago House began construction in 1842;
- Mr Windeyer engaged a workforce to drain swamps in his estates in the early 1840's;

- The chapel was built in 1860-1861 and renovated in 1879;
- The Windeyer estate was subdivided and sold in 1939, with the subject site being divided into eight farms (Lots 1 to 8 – see Figure 1 and Figure 2) ranging in size from 50 acres to 324 acres and offered as “rich dairy and agricultural farms”;
- Improvements within these eight allotments at the time of sale included a house in Lots 1 to 7, a mill / mill’s in Lots 2, 3 and 5, stone stables in Lot 3 and cultivated drains in Lot 2, 3, 6 and 7 (Figure 2);
- During WWII, Tomago House together with some buildings on the surrounding farms were occupied by the military authorities;
- During April 1942 and for the duration of the war, the RAAF operated a practice bombing range on the eastern portions of Lots 4, 5 and 6 (Figure 3);
- Following the Japanese attack on Newcastle in June 1942, an anti-aircraft battery was constructed on one of the farms to the east of Tomago House. The site chosen was a 17 acre in the centre of Cleary’s Farm (Lot 4 – Figure 4);
- The battery complex included four brick and concrete gun emplacements, with an associated underground command centre and three ammunition shelters which were erected close by (Figure 5);
- A roadway was also constructed to provide access to the battery (Figure 4);
- EJE considers the potential for general military relics within and around these sites is expected to be high;
- Following the war several changes of ownership of the farms on the site occurred;
- At the end of the 1950s farming was the primary landuse at Tomago, with 18 dairies in operation;
- Lots 7 and 8 were sold to Boyvemo Pty Ltd (later known as Australian Buffalo Grass Pty Ltd) which established a turf farm on the site;
- During the post war period industrial development in the areas increased, with numerous small and large industries (i.e. Courtaulds (a British Textiles Plant) followed by Tomago Aluminium in the early 1980s) established in the area making a significant impact on the landscape;
- A buffer area was established around Tomago Aluminium and the company proceeded to buy up land within the buffer zone;
- Fallout from the aluminium smelter led to the departure of dairy farmers from the study site in 1985 following concerns of unacceptable levels of Fluoride on grazing lands;
- A proposal for a steel mill on the land in 2001 was unsuccessful;
- Cessation of dairy farming and agricultural activities at Tomago led to environmental problems in some areas, as drains which carried away rainfall and floodwaters were no longer cleared and maintained. The land has subsequently reverted to its original swampy condition.

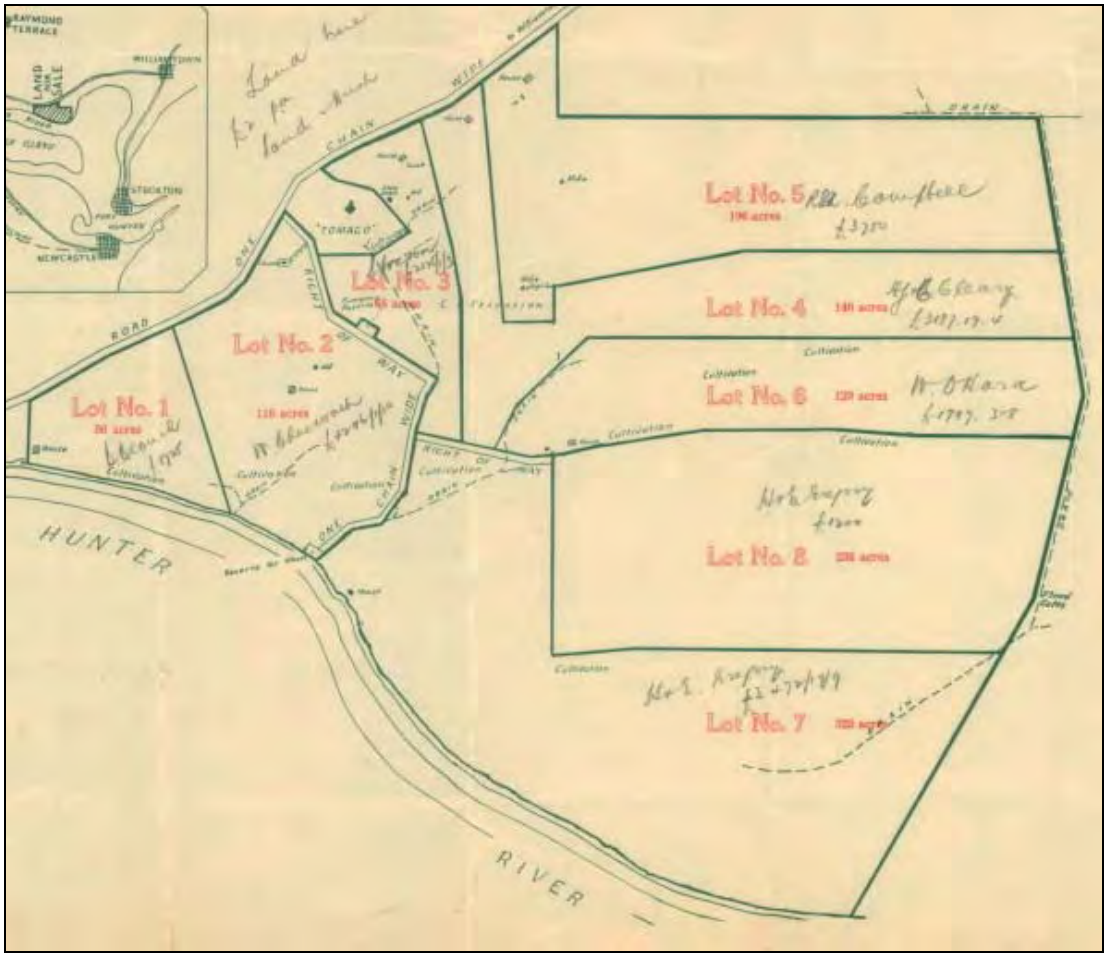

Figure 1: Subdivision Plan from EJE report

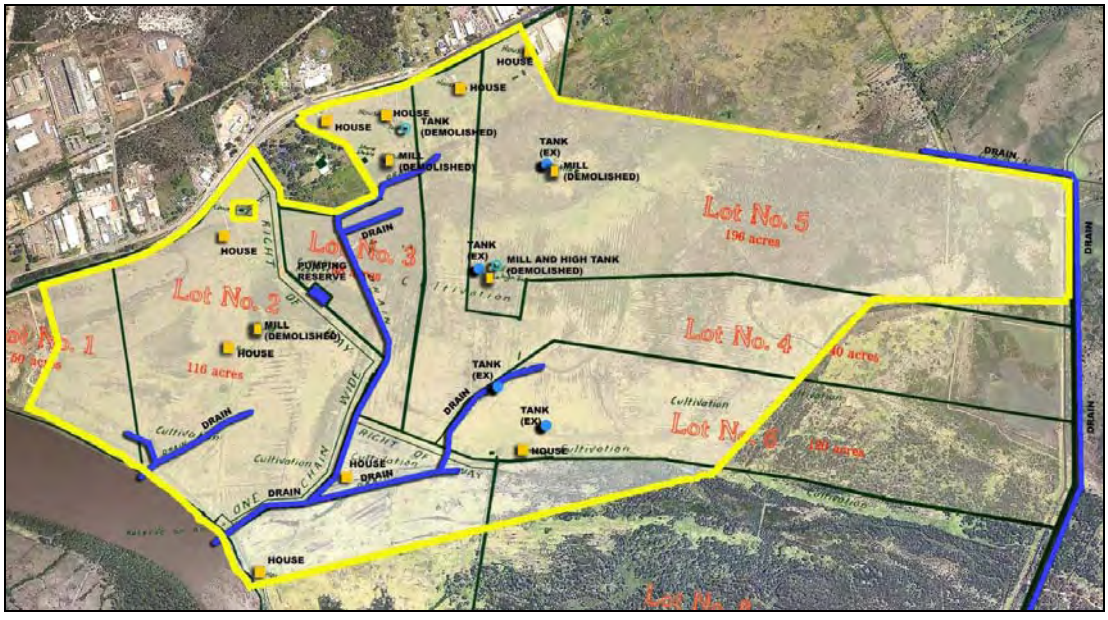

Figure 2: Overlay showing location of former mills and houses in relation to the existing location of water troughs, indicated with blue dots and labelled as TANK (EX) from EJE report

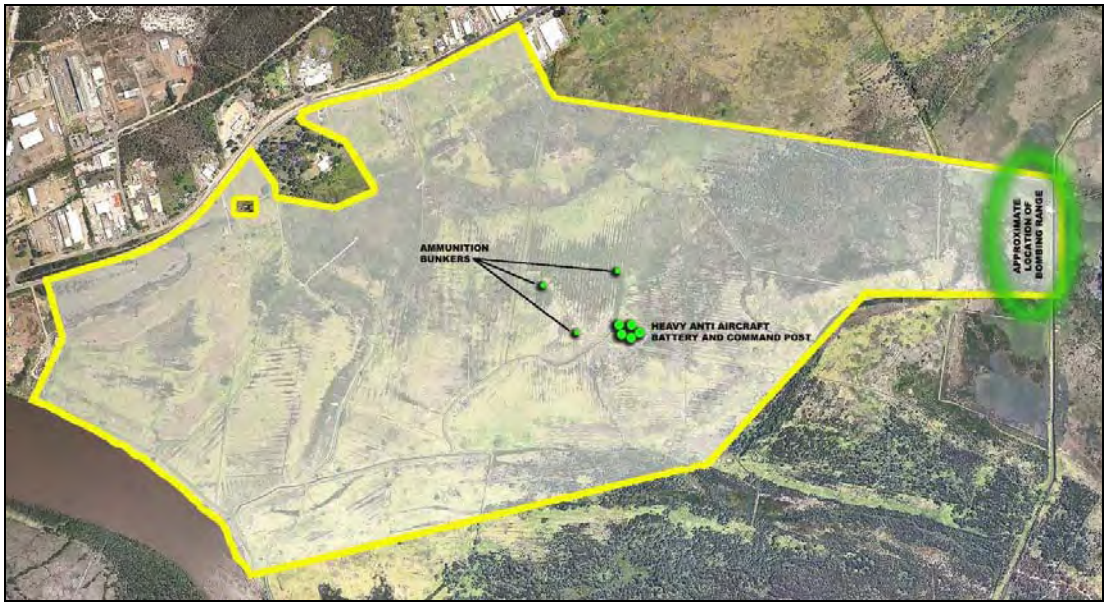

Figure 3: Aerial image showing location of former bombing range, and other remaining military fabric from EJE report

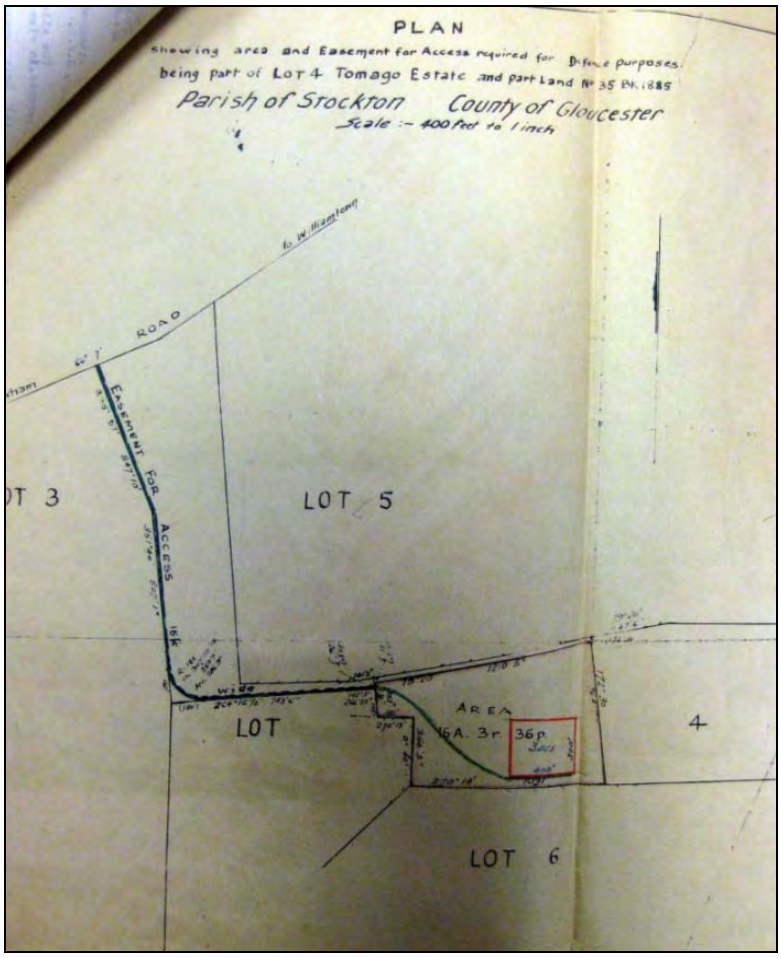

Figure 4: Plan showing location of anti-aircraft battery and access road from EJE report

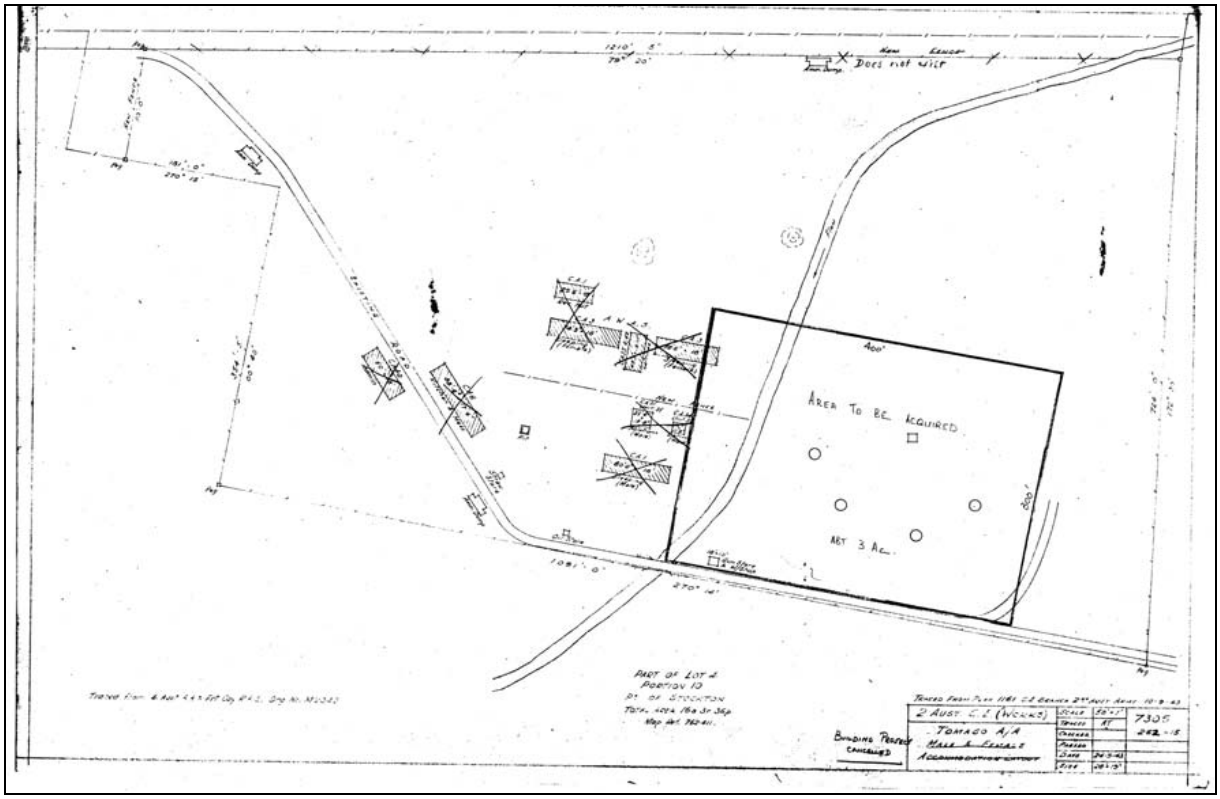

Figure 5: 1943 plan of antiaircraft gun emplacement site, indicating existing structures and cancelled new building project from EJE report

3.4 Unexploded Ordnances

Based on the review of the EJE heritage assessment additional searches were conducted by DP to assess the potential for unexploded ordnances (UXO) on the site, particularly for the purposes of occupational health and safety during drilling / excavations proposed for the fieldwork component of this investigation.

An on-line search of the Department of Defence UXO search tool indicated that Lots 4 to 8 (former title description) which includes the eastern portion of the site has a UXO potential of “Other”. The category of “Other” indicates that Defence records do not confirm that the site was used for live firing and UXO or explosive ordnance fragments / components have not been recovered from that site (i.e. The Department of Defence cannot assess as either slight or substantial risk of UXO). Further information on the website indicates that the RAAF bombing range was reportable never used.

Subsequent discussions / correspondence was undertaken with Mr Greg Guthrie of G-tek Australia Pty Ltd (G-tek), a UXO consultant accredited by the Department of Defence. Mr Guthrie provided a UXO assessment report conducted for the proposed steel mill site (Ref 13), which incorporated the subject site.

On the basis of advice from G-tek, DP engaged G-tek to clear test locations for potential UXO, prior to drilling / excavation, in the vicinity of the potential UXO risk areas (i.e. former gun emplacement site and possible bombing range).

Pertinent information for the current assessment from the G-tek report is summarised below:

- G-tek conducted a UXO assessment of the 545 ha proposed Steel Mill property at Tomago;
- The assessment comprised an initial desktop study to determine the potential for any remnant UXO within the property and to provide a risk analysis of the site. It is noted that no groundwork was conducted for the assessment;
- A ground practice bombing range with a circular radius of 1250 yards was established in Portion 10 in the Parish of Stockton. The range is centred near the eastern boundary of Lot 5 and Lot 4 (previous title description – i.e. eastern boundary of the subject site);
- A large number of trees were cut down, fences erected and possible targets established within the fenced area;
- G-tek considered the approach attack angle for this range is likely to be from the north, with no practice bombs released before Tomago Road and late releases going south towards the Hunter River;
- The Department of Defence possessed the site from July 1942 to June 1945 and following possession handed the land back to the land owners;
- No records were found by G-tek to indicate that ordnance related remediation works were conducted prior to handover to the owners, any compensation was paid to owners for potential or actual ordnance related contamination or any remnant items have been found within the site since that time;
- G-tek indicated that the most probable item potentially used within the practice bombing range were 10 or 11 ½ lb Practice Bombs generally used by British and Australian Forces at that time. These emit either smoke or a bright flash upon impact and were typically constructed of cast iron nose section, filled with lead for weighting and a central cavity through which passed a striker, which, on impact, initiated a detonator. The detonator initiated the fill material which was contained in the central tube of the tail cone and which, in turn, emitted flash or smoke through the tail of the bomb. The tail cone itself was generally light tin or similar metal and was often split open or torn off on impact and fill functioning, and often degrade quickly to rust when left exposed to the elements;
- The Battery position established within the site consisted of four guns mounted on heavy concrete platforms, probably with a steel circular gun mount to allow the guns to rotate through 360°. The site also contained three brick storehouses to hold the ammunition for these guns and the appropriate infrastructure to control the guns and administer the personnel. The standard heavy anti aircraft gun in use by Australia during WWII was the 3.7inch gun developed in Britain. The 3.7 fired a projectile of 28 lb (12.6kg) to a maximum effective slant range of 12,000 metres and to a height of 9,000 metres. The projectile was fitted with a time fuse that was preset by the gun crew to function a specified time after firing initiating the HE filling and creating a large blast in the air and generating a projecting a mass of fast moving fragmentation near, or in the path of, attacking aircraft. G-tek found no records to indicate that these guns were ever fired, and no Japanese aircraft are known to have approached the Sydney / Newcastle area after the gun position was established;

- G-tek indicated that personnel stationed within the area would have been equipped with personal weapons, and would have generally also carried, or had access to, such items as flares and hand grenades. The Stockton Rifle Range was close by and suitable for training and was probably widely used, but there is also a remote possibility that some ad hoc training may have been conducted in close proximity to unit locations, or that some explosive materials may have been stored or cached for immediate use in the case of invasion;
- G-tek concluded that a potential exists for the presence of unexploded Aircraft Practice Bombs within and adjacent to the previously fenced areas of the Tomago Practice Bombing Range within Lots 4, 5, and 6 of Portion 10 Parish of Stockton, (i.e. within the subject site);
- G-tek concluded that a potential exists for the presence of remnant or discarded items of military origin, including small arms ammunition, pyrotechnics and general non-explosive related waste within the subject site, particularly within and adjacent to the former Anti Aircraft Battery position;
- Based on the short period of use of the Practice Range, the nature of the items used and lack of any reporting of UXO from within the site, it was considered by G-tek that the current risk of UXO from air delivered munitions is slight;
- Based on the short period of use of the Anti Aircraft Battery position, the nature of the items used and lack of any reporting of UXO from within the site, it was considered by G-tek that the risk of UXO from anti aircraft munitions within the Site is very slight;
- Based on the short period of use of the Site for general military usage, the nature of the items carried by soldiers, and lack of any reporting of UXO from within the Site, it was considered by G-tek that the current risk of UXO from personal weapons within the Site is very slight;
- Should the use of the Site undergo radical change through intrusive activity or more general ability for public access, G-tek indicated that the probability of encountering air delivered UXO, particularly within the Eastern end of Lots 4, 5 and 6 may increase;
- Where the land use may be changed through the proposed industrial development, G-tek recommended that information on the past use of the area and the potential for remnant military infrastructure, waste and lost or discarded material of military origin, particularly in the Eastern portion of the proposed development area, within and adjacent to Lot 4, be included within any site management plans;
- Where the land use within other parts of Lots 4, 5 and 6 may be changed from current grazing activities G-tek recommended that a physical assessment be conducted to determine the nature and extent of any remnant UXO contamination from air delivered munitions, particularly aircraft practice bombs;
- Where the land use within the remaining parts of the site may be changed from current grazing activities G-tek recommended that no further caveats or assessment in relation to the potential for UXO need apply.

It is noted that the proposed development area was constrained to a 150 ha parcel of land in the western portion of the 545 ha proposed steel mill property investigation by G-tek and the subject site for this assessment varies slightly to that investigation by G-tek.

4. Site Condition

Details of the site condition were previously outlined in DP PCA report (Ref 11) based on a site inspection conducted in early July 2010.

An additional site inspection was conducted for the current investigation on the 12 July 2011 to 14 July 2011 and included areas of the site not previously inspected for the PCA due to access constraints.

A summary of site conditions not previously outlined in Ref 11 and a summary of conditions which have altered since our original inspection in early July 2010 are provided below.

Site conditions observed in July 2011 remained relatively similar to those observed in July 2010 with the following exceptions:

- The site was slightly drier (i.e. less water logged soils) at the time of the 2011 inspection compared to the 2010 inspection. This, however, changed over the course of the fieldwork component of the investigation as significant rainfall occurred;
- Large portions of the site which were previously slashed to maintain low vegetation cover across the site, were now covered with a thick cover of reeds or grass, which significantly reduced the visibility of the ground surface and impeded the identification of formerly identified potential contaminant sources (i.e. former building, building wastes etc);
- The four unoccupied residential dwellings within the northern portion of the site adjacent to Tomago Road observed in the 2010 inspection had been removed from the site. Remnant building rubble was observed at the ground surface of the former buildings including bricks, tiles, timber, paint flakes and fibro sheeting fragments (potential asbestos);
- A number of internal fences delineating former residential structures and paddocks had been removed.

Additional areas of the site not inspected during the previous investigation due to access constraints comprised the north eastern portion and south eastern portion of the site. Pertinent site features observed in these areas during the current inspection are summarised below and shown in Photo 1 to Photo 15 following.

- The north eastern corner of the site (Photo 1 to Photo 8, Photo 12 and Photo 13) comprised a water logged area generally covered by a thick reed cover, some slightly elevated areas along former access tracks and along the north eastern boundary which are generally covered by thick grasses and blackberry bush vegetation and some sections of pine forest / scattered pine trees;
- An open channel / drain is located along the north east boundary of the site (Photo 1) which contains a weir and several culverts allowing water flows from the site and adjacent sites to be controlled. The weir at the time of the inspection was shut preventing water flow from the northern section of the channel to the south. Ponded surface water from the site and property to the east, however, did flow into the channel to the south of the weir;
- Former access tracks were observed adjacent to a number of drains across the northern section of the site (Photo 2, Photo 4 to Photo 6) and may have been constructed from materials excavated from adjacent drains;
- A septic tank (Photo 9) and house slab with fibro sheeting fragments and other building materials (Photo 10) was observed in the southern portion of the site near a large fig tree;

- The south eastern portion of the site comprised a thick grass / blackberry bush cover with some shallow drains and some water logged areas (Photo 11). A lower lying area comprising a thick tree cover and partially water logged surface was located to the south / south west of the drainage line in the south eastern corner of the site;
- Concrete piers (Photo 15) and a corrugated iron water tank (Photo 14) from a former residence were observed in the south western portion of the site. A 3 m by 3 m excavated hole (approximately 1.5 m deep was located immediately to the west of the former residence – purpose unknown).

Photo 1: Low-lying plain with thick reeds and adjacent open channel / drain to the east of the site in the north eastern corner of the site

Photo 2: Low-lying plain with thick reeds within the site (left), fill mound / adjacent drain along the northern site boundary and pine forest within the northern portion of the site (background)

Photo 3: Low-lying plain with thick reeds within the north eastern portion of the site

Photo 4: Former raised access track (thick grass covered) with adjacent low lying pine forest and drains (dense reed cover)

Photo 5: Surface water at the ground surface migrating onto the site at the northern boundary

Photo 6: Low-lying plain with thick reed / grass cover within the north eastern portion of the site, raised access track (left)

Photo 7: Low-lying plain with thick grass cover in the foreground (slightly elevated area) and thick reed cover (background at right – water logged lower area) within the north eastern portion of the site

Photo 8: Low-lying plain with reed cover (water logged)

Photo 9: Septic tank with broken concrete lid in the southern portion of the site, thick grassed covered field in background, drain with thick reed cover (left)

Photo 10: Fibro sheeting fragments and other demolition was at the surface of a former concrete house slab, rusted corrugated iron water tank (right) and thick grassed covered field (left)

Photo 11: Thick grass covered plain in the south eastern corner of the site. Pine tree line (right) is the eastern boundary of the site

Photo 12: Thick grass covered plain in the north eastern portion of the site. Thick reed cover within creek / drain (left), former raised access track with adjacent water logged thick reed cover (right)

Photo 13: Thick grass covered plain in the north eastern portion of the site. Thick reed cover water logged area in background

Photo 14: Corrugated iron water tank associated with former residence, with thick reed cover associated with the adjacent drain in the background

Photo 15: Thick grass covered footing associated with a former residence in the south-western portion of the site

5. Geology and Hydrogeology

5.1 Geology

Reference to the 1:250,000 Newcastle Geology map indicates that the site is underlain by Quaternary alluvium, which typically comprises gravel, sand, silt and clay. The underlying bedrock comprises siltstone and sandstone of the Permian aged Tomago Coal Measures.

Reference to the Beresfield and Williamtown Acid Sulphate Soil Risk Map prepared by the Department of Infrastructure, Planning and Natural Resources (DIPNR) indicates that the site lies within two acid sulphate soil risk zones. The majority of the site lies within an area of high risk of acid sulphate conditions between 1 m to 3 m below the ground surface (Ap4 – alluvial plain, elevation 2 m - 4 m), while the north eastern portion of the site (raised sandy area within 100 m to 200 m of Tomago Road) lies within an area of low probability of acid sulphate soil conditions greater than 3 m below the ground surface (Wa4(p) – Aeolian sandplain, elevation >4 m).

5.2 Geotechnical Model of the Site

The data from the previous and current investigations indicate that the soil profiles at the site can be split into two broad categories:

North-Western Zone

The North-western Zone comprises a strip of land that adjoins Tomago Road and is around 200 m wide. This zone generally coincides with the southern fringe of the Pleistocene barrier dune formation. The subsurface conditions may be generalised as shown in Table 2.

Table 2: General Subsurface Conditions - North-Western Zone

Depth (m)		Description	Unit
From	To		
Ground level	0.15 / 0.25	TOPSOIL – Clay / Silty sand / Sandy silt, organic matter	1
0.15 / 0.25	4.2 / 5.3	SAND – very loose to loose, silty in part	3a
4.2 / 5.3	9.2 / 14.4	SAND – dense to very dense	3b
9.2 / 14.4	10.7 / 15.7	CLAY – very stiff to hard	4
10.7 / 15.7	-	BEDROCK – extremely low to low strength interbedded Siltstone / Sandstone	5

South-Eastern Zone

The South-eastern Zone comprises the remainder of the site, and the generalised subsurface conditions are shown in Table 3.

Table 3: General Subsurface Conditions - Southern Zone

Depth (m)		Description	Unit
From	To		
Ground level	0.15 / 0.25	TOPSOIL – Clay / Silty sand / Sandy silt, organic matter	1
0.15 / 0.25	0.5 / 1.5	SILTY CLAY - firm, medium to high plasticity	2a
0.5 / 1.5	3.5 / 9.6	SILTY CLAY and CLAYEY SAND - sensitive fine grained soil, very soft to soft, low plasticity	2b
3.5 / 9.6	7.1 / 13.5	SAND – very loose to loose, silty in part	3a
7.1 / 13.5	10.8 / 25.2	SAND – dense to very dense	3b
10.8 / 25.2	29.1 / 38.7	CLAY – very stiff to hard	4
29.1 / 38.7	-	BEDROCK – very low strength Siltstone / Sandstone	5

It is noted that further south, adjacent to the Hunter River the depth of very soft to soft silty clay (Unit 2b) was found to exceed 60 m. The bedrock in this area was encountered from 76.4 m depth.

5.3 Hydrogeology

Groundwater levels were gauged in all monitoring wells on 5 September 2011 to provide comparable water levels across the site. When combined with survey levels for each well, the water table level (relative to AHD) could be determined. These levels were used to construct a groundwater contour plan of the site, Drawing 3.

The apparent groundwater flow regime is generally to the south-west towards the North Arm of the Hunter River (located adjacent to the south-western boundary of the site) and to the south-east towards the SEPP 14 wetlands (and Ramsar wetlands). These are considered to be the nearest sensitive receptors.

It should be noted that the groundwater levels and flow patterns would vary locally due to surface drains and complexity of soil conditions (varying strata and permeabilities). The form of the contour plan is primarily governed by sub-surface water rather than surface water. This is explained further below in Section 5.4.

It is further noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

An on-line records search of groundwater wells registered with the OEH (formerly DNR) indicated that the nearest registered groundwater well (GW017544) is located within the western portion of the site, north of the church, and is authorised for Domestic Stock with the intended purpose of irrigation. The well was installed to 9.14 m through sand with nominal water supply. No details on water bearing zones, screen interval or water quality were provided. There are no registered wells between the remainder of the site and the nearest receptor (i.e. Hunter River).

A number of other registered wells are located to the north of Tomago Road within the industrial estate, however are likely to be up-gradient of the site.

Reference to the Beresfield and Williamtown 1:25,000 Topographic maps, indicates the elevation of the site is <10 m AHD and comprises a number of drains which traverse the site and discharge into the Hunter River at two outlets on the south western boundary of the site.

5.4 Conceptual Hydrogeological Model of the Site

The combined data from the previous and current investigations indicate that the groundwater regime at the site has the following components:

- Unconfined sand aquifer in the approximately 200 m wide strip of the site inside the north-western boundary (Unit 1, over Units 3a and 3b). This represents the southern extent of the inner barrier dune system, which includes the Tomago Sandbeds;
- Unconfined low-permeability aquifer in the upper clay / silt / sand (Unit 1) over the low-lying majority of the site. Open drains have been cut through this into the underlying clay unit;
- Semi-confining layer (leaky aquitard) of low-permeability clay and silty clay (Units 2a and 2b) which is prevalent over the low-lying majority of the site;
- Semi-confined aquifer in the lower sand layers (Units 3a and 3b) which responds to changes in head in the river;
- Base of lower aquifer is the deep clay (Unit 4) and the bedrock (Unit 5).

Figure 6 below shows a diagram of the conceptual groundwater model. It is noted that subsurface conditions have been simplified for the purposes of the diagram.

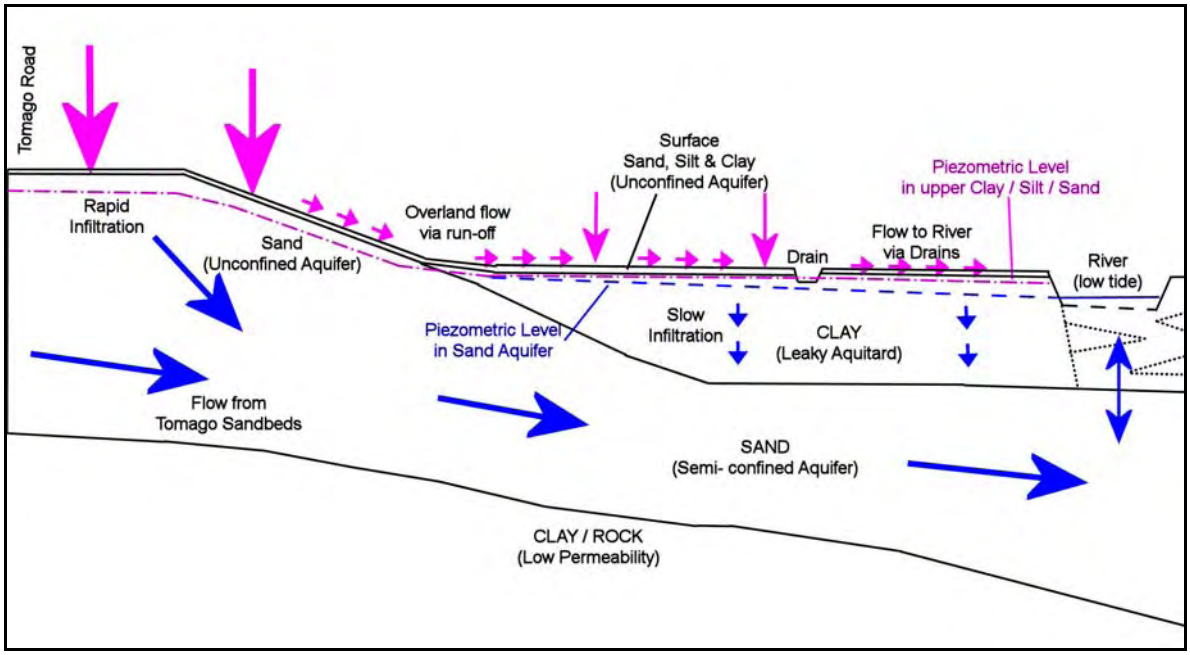

Figure 6: Conceptual Groundwater Model for Northbank Enterprise Hub

The principle sand stratum (Unit 3) is unconfined in the north-western part of the site adjacent to Tomago Road. Rainfall would infiltrate readily into this profile. For the major low-lying part of the site, the Unit 3 sand is overlain by relatively lower permeability clay (Unit 2 silty clay / clayey sand). The sand becomes a semi-confined aquifer; infiltration from rainfall and overlying surface waters would be relatively slow. Water level measurements in upper and lower aquifer wells indicate that the piezometric head in the semi-confined lower aquifer is up to 0.5 m below the piezometric level in the upper unconfined aquifer, being essentially perched on the surface clay / silt / sand. Furthermore, the piezometric level in the lower aquifer has been observed to respond to the water level in the river.

The difference between the two phreatic surfaces reduces to the north-west, approaching Tomago Road, and appear to converge where the clay layer “wedges out”.

The water levels in the upper aquifer of the low-lying part of the site are primarily controlled by surface features, run-off and drains. In turn, the levels in the drains are controlled by weirs near the river outlets.

The groundwater contours (Drawing 3), therefore, are more representative of the phreatic surface in the lower sand aquifer rather than the near-surface waters in the upper aquifer.

The horizontal groundwater flow rates have been estimated based on the hydraulic gradients from the current groundwater contour plan, estimated porosities, and permeability values from field pump tests carried out in 2001 (Ref 10). These are shown in Table 4 below.

Table 4: Estimated Horizontal Groundwater Flow Rates

Case	Porosity	Hydraulic Gradient, i	Permeability range, k (m/s)	Velocity range, V_h (m/yr)
Western Area towards Hunter River				
Upper Leaky Aquitard	0.60	0.0045	1 - 6 x 10^{-5}	2.4 - 14
Lower Sand Aquifer	0.35	0.0045	2 - 3 x 10^{-4}	80 - 120
Southern Area towards Lot 1002				
Upper Leaky Aquitard	0.60	0.0004	1 - 6 x 10^{-5}	0.21 - 1.3
Lower Sand Aquifer	0.35	0.0004	2 - 3 x 10^{-4}	7.2 - 11

6. Potential Contamination

On the basis of the PCA (Ref 11), the site inspection conducted for the current assessment, review of the EJE Heritage Assessment (Ref 12) and the G-tek UXO Ordnance Assessment (Ref 13), the principal sources of potential contamination at the site are considered to be:

On-site

- Imported fill materials observed predominantly within access tracks across the site, within the levee bank along the Hunter River and associated with access for transmission easements, but also at former / current structures and where drain diversions have occurred (including ash, roadbase, coal reject, asphalt, gravels, soil stockpiles etc) which may contain a range of contaminants depending on the source of fill;
- Demolition waste including fibro sheeting fragments and paint residues / flakes observed at the ground surface in the vicinity of former buildings / sheds / mills which may contain potential contaminants including asbestos, heavy metals and hydrocarbons;
- Former buildings / sheds / structures which may contain a range of potential contaminants depending on the use and chemicals stored including asbestos, hydrocarbons, pesticides, PCB, heavy metals;
- Former WWII gun emplacements, command centre, ammunition bunkers and practice bombing range and associated infrastructure which may contain a range of potential contaminants including acids, ammonia, solvents, chlorinated hydrocarbons, heavy metals, petroleum hydrocarbons, explosives and potential UXO;
- Former cropping which may have resulted in pesticide, heavy metal and hydrocarbon impact to near surface soils;
- Former dairy farming activities which may have resulted in localised hydrocarbon, heavy metal, pesticide impact to surface soils in the vicinity of former sheds / infrastructure where chemicals were used;

- Former agricultural practices (i.e. clearing / ploughing) and construction of drainage networks across the site, which may have resulted in the oxidation of potential acid sulphate soils and / or the promotion of salinity issues;
- Former on-site wastewater disposal systems, which may have resulted in localised heavy metal, hydrocarbon, nutrient and microbiological impact to soils and groundwater.

Off-site

- The site falls within the Tomago Aluminium smelter buffer zone. A monitoring station on-site form part of the smelters environmental monitoring network. Potential contamination from the smelter include fluoride and sulphates from atmospheric fallout, and possibly Fluoride in groundwater migrating onto the site (although considered low risk given discussions with Tomago Aluminium);
- Migration of potential contamination in groundwater and surface water from up-gradient industrial subdivisions, including the former Genkem site (now MinMet operations Pty Limited), Custom Chem (Custom Chemical industry), adjacent scrap metal yard and other industrial sites which have on-site septic systems or may be contaminating soils / groundwater from other site activities.

7. Data Quality Objectives

The scope of the assessment has been broadly devised with reference to the seven step data quality objective process, as defined in Australian Standard AS 4482.1–1997 *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds* (Ref 26). The Data Quality Objectives (DQO) process is outlined below:

Step 1 - State the Problem

The site is proposed to be developed for industrial / commercial purposes. The DP PCA (Ref 11) identified several potentially contaminating activities at the sites. The 'problem' to be addressed was to provide further information on the following:

- Assess past and present contaminating activities;
- Report on site conditions;
- Provide an assessment of site contamination;
- Provide comments on the suitability of the site for the proposed future commercial / industrial landuse.

Step 2 - Identify the Decision

The analytical results for soils are compared to NSW EPA *Guidelines for the Site Auditor Scheme* (Ref 18), NSW EPA sensitive landuse guidelines (i.e. *Guidelines for Assessing Service Station Sites*, Ref 22), and NSW DECC *Waste Classification Guidelines* (Ref 23) for possible off-site disposal of soils / filling.

The analytical results for groundwater are compared to ANZECC *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (Ref 3).

Step 3 – Identify the Inputs to the Decision

The results of the DP PCA and site observations from the current site walkover were used to select the judgemental and systematic sampling locations, contaminants of concern and the required test analytes.

Step 4 – Define the Boundary of the Assessment

The boundary of the assessment was the extent of the proposed Northbank Enterprise Hub at Lot 1001 DP 1127780, 365 Tomago Road, Tomago, as indicated on Drawings 1 to 3.

Step 5 – Develop a Decision Rule

The assessment criteria for soil are the NSW EPA *Guidelines for the Site Auditor Scheme* which present National Environmental Health Forum (NEHF) levels for various beneficial use scenarios. Additional assessment criteria include sensitive land use criteria from the NSW EPA *Guidelines for Service Station Sites* (Ref 22) for TRH and BTEX. The assessment criteria for groundwater are the ANZECC Trigger Levels for Slightly to Moderately Disturbed Ecosystems (Ref 3).

Analysis of the sample data will comprise comparison of individual results with the commercial / industrial landuse criterion and ANZECC trigger levels. In the event that individual results exceed the adopted criteria, the 95% Upper Confidence Limit (UCL) will be calculated for exceedances, grouped into material types across the site, and compared to the relevant land use criteria. For each grouping or data set, the following requirements are to be met:

- The 95% UCL-mean must be less than the adopted land use criteria;
- No single value exceeds 250% of the adopted land use criteria.

In the event that the above requirements are not met for the commercial / industrial landuse criterion, the site is considered unsuitable for the proposed land use. The above calculations may also identify 'hot spots' within the site.

Step 6 – Specify Acceptable Limits on Decision Errors

In order to assess accuracy and reproducibility of the results, Quality Assurance and Quality Control (QA/QC) measures and evaluations were incorporated into the sampling and testing regime. All sampling data was recorded on DP chain of custody sheets, and the general soil sampling procedure comprised:

- The use of disposable gloves for each sampling event;
- Transfer of samples into the appropriate laboratory-prepared glass jars, and capping immediately;
- Collection of 10% replicate samples for QA/QC purposes;
- Collection of replicate soil samples in zip-lock plastic bags at each depth for PID screening;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Collection of acid sulphate soil samples within zip-lock plastic bags (first wrapped in plastic cling wrap, taking care to remove any air) at several depths;
- Placement of the sample containers, replicate sample bags and acid sulphate soil samples into a cooled, insulated and sealed container for transport to the laboratory;
- Use of chain of custody (C-O-C) documentation ensuring that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory;
- Freezing of acid sulphate soil samples as soon as possible.

The process of obtaining samples and their transportation, storage and delivery to laboratories for analysis was documented on a DP standard chain-of-custody form. Copies of completed forms are contained in Appendix C.

Replicate samples for each sample were screened for the presence of volatile organic compounds (VOCs), using a calibrated MiniRAE Lite, MiniRAE 2000 or PhotoVAC 2020 Pro Plus photo-ionisation detector (PID) with a 10.6 eV lamp, calibrated to 100 ppm Isobutylene. The PIDs are capable of detecting over 300 VOCs. PID calibration forms are presented in Appendix C.

The work was undertaken using standard procedures for contamination assessments. A list of the procedures used and other information on quality assurance and quality control, including analysis of replicate samples, is presented in Appendix C.

The following field QA/QC procedures were implemented during the investigation:

- Standard operating procedures were followed;
- Site safety and environmental plans were developed prior to commencement of works;
- Duplicate or replicate field samples were collected and analysed;
- Samples were stored under secure, temperature controlled conditions;
- Chain of custody documentation was used for the handling, transport and delivery of samples to the selected laboratories.

Step 7 – Optimise the Design for Obtaining Data

Environmental sample collection procedures, as described in Section 8.2, were developed prior to undertaking the contamination assessment fieldwork. These procedures generally concur with NSW DECCW guidelines and current industry practice. DP engages NATA-registered analytical laboratories to conduct sample analysis.

Table 5 summarises the Data Quality Indicators (DQIs) used to assess the achievement of the Data Quality Objectives.

Table 5: Data Quality Indicators

DQI	Achievement Evaluation Procedure	Target
Completeness	Critical Samples collected - location and depth Experienced field staff Documentation correct Critical samples analysed Chemical analysis per SAQP Complied with holding times	95%
Comparability	Consistent sampling procedures Climatic / physical site conditions Experienced field staff Same laboratories used	Qualitative
Representativeness	Appropriate media sampled All analytes in SAQP sampled All samples analysed per SAQP	Qualitative
Precision (variability or reproducibility)	Analysis of field and laboratory replicates and achievement of acceptable RPDs, acceptable levels for laboratory QC criteria.	RPD 0 - 50%[1] RPD 0 - 35%[2]
Accuracy (bias)	Analysis of field blanks, rinsate blanks, matrix spikes, surrogate spikes, etc.	60 - 40%[3] 70 -130%[4]

Notes to Table 5.

1. Relative Percentage Difference for Organics for results > 5xPQL
2. Relative Percentage Difference for Inorganics for results > 5xPQL
3 Laboratory Recovery of Spikes for Organics for results > 5xPQL
4 Laboratory Recovery of Spikes for Inorganics for results > 5xPQL

8. Field Work

8.1 Scope of Field Work Programme

The assessment comprised the following tasks:

- Site walkover inspection by an experienced environmental engineer to confirm current site conditions, identify potential contamination sources and to assess previously identified contamination sources from the Stage 1 assessment (Ref 11);
- Surface water monitoring for pH/EC was undertaken at selected locations during the site walkover inspection;
- Clearance of pertinent test locations for underground services and unexploded ordinances (UXO) by a professional service locator / registered UXO clearance professional;
- Field sampling at 120 locations as follows:
    - Drilling of 25 bores at 21 locations using a specialised track mounted drill rig for sampling soils and installation of monitoring wells;
    - Excavation of 42 test pits by 4WD backhoe for sampling of soils in the vicinity of former structures and potential contamination sources;
    - Excavation of 14 test pits by tracked excavator to sample soils in the vicinity of former structures and potential contamination sources in areas inaccessible to regular vehicles;
    - Excavation of 42 shallow pits by hand in areas inaccessible to vehicles, typically in areas used for agricultural purposes.
- Installation of 25 groundwater monitoring wells to depths of 3 m to 13.5 m;
- Developing, purging and sampling of the wells for chemical analysis to assess baseline water quality at the site;
- Installation of automatic water level data loggers in six of the 25 wells for ‘continuous’ recording of water levels;
- Sampling of surface waters at 21 locations for chemical analysis to assess baseline water quality;
- Chemical testing of selected soil and water samples for potential contaminants;
- Acid sulphate screening tests and detailed testing of selected soil samples for the assessment of acid sulphate soil conditions.

Laboratory testing for the contamination assessment was undertaken by Envirolab Services, a National Association of Testing Authorities, Australia (NATA) registered laboratory. Analytical Methods used are shown on the laboratory sheets in Appendix B.

Testing was undertaken for selected soils, groundwater, surface waters and cement sheeting fragments as presented in Section 9.

Further details of the investigation procedures and methodologies are presented in the following sub-sections.

8.2 Sampling Rationale

A systematic and judgemental sampling procedure was conducted for the contamination assessment to address the potential sources of contamination described above.

The borehole and test pit locations were set out by an experienced Environmental Engineer from Douglas Partners Pty Ltd (DP). An Environmental Scientist / Engineer logged the subsurface profile in each borehole and test pit and collected samples for identification and testing purposes. The approximate test locations are shown on Drawing 1, Appendix D.

8.3 Bores and Test Pits

The subsurface investigation comprised a total of 120 test locations within accessible areas of the 241 ha site. Fieldwork was undertaken from 26 July to 11 August 2011 and included the following:

- Drilling of 25 boreholes at 21 locations by drilling rig to depths of 3.45 m to 13.5 m;
- Installation of 25 groundwater monitoring wells to depths of 3.0 m to 13.4 m, including four 'paired' wells within the above drilled boreholes;
- Excavation of 42 test pits by 4WD backhoe to depths of 1.0 m to 3.0 m;
- Excavation of 14 test pits by excavator to depths of 0.6 m to 1.8 m;
- Excavation of 42 test pits using hand tools methods to depths of 0.4 m to 0.65 m.

Samples were selected for analysis on the basis of the likely presence of contamination, based on material type, visual or olfactory evidence of possible contamination (i.e. odour or staining), proximity to a known source of contamination, and whether generally representative of soil / fill conditions.

8.4 Groundwater Sampling

Groundwater purging and sampling was undertaken for the 25 groundwater monitoring wells installed above. Of these, 21 wells were screened in the upper aquifer and four screened in the lower aquifer, including four well 'pairs'.

The procedure used for gauging, purging and sampling of wells was as follows:

- The headspace of each well was screened for the presence of VOCs using a calibrated PID;
- Groundwater levels were measured from the top of the PVC pipe using an oil-water interface probe to assist in determining groundwater flow direction and presence of floating product;
- The wells were purged using a MP15 MicroPurge low-flow water sampler (lower aquifer), or new Clearview single check valve disposable bailers (fill aquifer). During purging pH, EC, Eh, turbidity and temperature readings were taken using calibrated portable meters, until steady readings were achieved;
- The groundwater level was allowed to recover from the effects of purging prior to sampling;

- The water samples were placed in laboratory-prepared containers by filling with zero headspace to avoid loss of volatiles. Samples for metals analysis were filtered in the field using 0.45 µm disposable filters;
- The samples were stored on ice for transport to the laboratory, to arrive within the recommended holding times for analysis.

The headspace of groundwater collected from each well was also screened for the presence of volatile organic compounds (VOCs) using a calibrated PID. PID calibration certificates are provided in Appendix C.

Non disposable sampling equipment was decontaminated between wells using Decon 90 and tap water to minimise risk of cross contamination. The process of obtaining samples and their transportation, storage and delivery to laboratories for analysis was documented on a DP standard chain-of-custody form. Copies of completed forms are contained in Appendix C.

Wells and standpipes were developed using individual Clearview single check valve disposable bailers, or motorised suction pump with PVC hosing which was decontaminated between wells using Decon 90 and tap water to minimise the risk of cross contamination. Development continued until wells were dry or a minimum of five bore volumes of groundwater was extracted and steady readings of pH, electrical conductivity (EC), redox potential (Eh), turbidity and temperature were achieved using calibrated portable meters. This was done to achieve an efficient hydraulic connection between the well and the formation.

8.5 Surface Water Sampling

A total of 23 surface water samples (including two replicate samples) were collected at 21 surface water locations (SW121 to SW141). The surface water bodies were located within the site and at locations upstream and downstream of the site on 15 and 16 August 2011.

The samples were collected with a long-handled “swing sampler” using the “grab” method (i.e. single sample collected at a point at a single time). The general sampling procedure comprised:

- Decontamination of sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and tap water prior to collecting each sample to minimise the potential for cross-contamination;
- The use of new disposable gloves for each sampling event;
- Transfer of samples into laboratory-prepared containers with zero headspace and capping immediately;
- Collection of 10% replicate samples for QA/QC purposes;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Placement of the sample containers into a cooled, insulated and sealed container for transport to the laboratory.

A replicate surface water sample was also collected for PID headspace screening. The results of PID screening are shown in Section 9.3.

The process of obtaining samples and their transportation, storage and delivery to laboratories for analysis was documented on a DP standard chain-of-custody (COC) form. Copies of completed forms are contained in Appendix D.

9. Results of Field and Laboratory Testing

9.1 Subsurface Conditions

The subsurface conditions are presented in detail in the borehole and test pit logs in Appendix A. These should be read in conjunction with the general notes preceding them, which explain definitions of the classification methods and descriptive terms used.

The Site can be broadly divided into two zones on the basis of subsurface conditions. The following is a summary of the subsurface conditions / stratigraphy encountered in each zone:

North-Western Zone

The North-western Zone comprises a strip of land that adjoins Tomago Road and is around 200 m wide. This zone generally coincides with the southern fringe of the Pleistocene barrier dune formation.

The subsurface conditions may be generalised as comprising topsoil (sandy clay, silty sand, silt) overlying generally dense sand to depths ranging from 9.2 m to 14 m, overlying very stiff to hard clay to depths ranging from 10.7 m to 15.7 m. The lower clay is underlain by sandstone and siltstone bedrock.

South-Eastern Zone

The South-eastern Zone comprises the remainder of the site, where the inner barrier sand has been overlain by fine-grained Holocene deposits of silty clay, clayey silt and sandy clay. The generalised subsurface conditions comprise topsoil (sandy clay, silty sand, silt), overlying very soft to firm silty clay to depths of up to 9.6 m. The soft clay is underlain by generally dense sand to depths of up to 25.2 m, then very stiff to hard clay to depths of up to 38.7 m and bedrock.

Groundwater

Groundwater is present in two aquifers. The groundwater system comprises an unconfined aquifer in the upper strata, a semi-confining layer (leaky aquitard) of low-permeability clay and silty clay, overlying a semi-confined sand aquifer which responds to changes in head in the river.

These results were used in conjunction with previous data to develop geotechnical and hydrogeological models of the site, as presented in Section 5.

9.2 Contaminant Observations

Observations of potential contamination within the boreholes and test pits were generally limited to upper fill materials i.e. primarily at the surface. The observations noted on bore and test pit logs are summarised in Table 6 below.

Table 6: Contaminant Observations in Pits and Bores

Potential Contaminant Observation	Test Location / Depth (m)
Ash fines / ash gravel	Bore 11/0.2-0.6, Pit 23/0.0-0.4, Pit 24/0.0-0.6, Pit 25/0.0-0.2, Pit 34/0.0-0.6, Pit 35/0.0-0.6, Pit 36/0.06-0.08, Pit 38/0.3-0.6, Pit 39/0.3-0.45, Pit 41/0.2-0.4, Pit 42/0.1-0.3, Pit 43/0.0-0.1, Pit 43/0.2-0.9, Pit 46/0.0-0.4, Pit 47/0.4-0.7, Pit 52/0.3-0.45, Pit 53/0.15-1.1, Pit 54/0.2-0.35, Pit 62/0.0-0.6, Pit 64/0.15-0.6, Pit 66/0.0-0.9, Pit 79/0.0-0.4, Pit 81/0.0-0.4, Pit 86/0.0-0.5
Coal fines / coal	Bore 10/0.3-0.8, Bore 12/0.4-0.6, Pit 23/0.4->1.5, Pit 31/0.0-0.1, Pit 31/0.3-0.6, Pit 36/0.08-0.3, Pit 42/0.3-0.95, Pit 43/0.0-0.1, Pit 43/0.2-0.9, Pit 44/0.0-2.0, Pit 45/0.3-0.9, Pit 46/0.0-0.4, Pit 52/0.3-0.45, Pit 53/0.15-1.1, Pit 54/0.2-0.35, Pit 55/0.3-0.8, Pit 56/0.15-0.8, Pit 57/0.0-0.9, Pit 59/0.15-0.25, Pit 60/0.15-0.3, Pit 61/0.0-1.3, Pit 62/0.0-0.6, Pit 72/0.0-0.2, Pit 76/0.0-0.15, Pit 77/0.0-0.35, Pit 78/0.0-0.3
Slag	Pit 43/0.0-0.1
Asphalt	Pit 54/0.0-0.2
Building rubble in filling (bricks, concrete, timber, glass, metal, plastic)	Pit 26/0.0-0.45, Pit 32/0.0-0.3, Pit 39/0.3-0.35, Pit 44/0.3-0.6, Pit 44/0.3-2.0, Pit 45/0.0-0.1, Pit 46/0.15-0.4, Pit 48/0.0-0.2, Pit 49/0.0-0.0.25, Pit 52/0.0-0.15, Pit 53/0.0-0.15, Pit 56/0.0-0.15, Pit 61/0.4-0.6, Pit 65/0.3->1.1, Pit 68/0.0-0.2, Pit 78/0.0-0.3, Pit 92/0.0-0.4,
Gypsum	Pit 41/0.2
Hydrocarbon odour	Pit 94/0.3->0.5, Pit 114/0.15->0.5, Pit 115/0.2->0.5

The results of PID screening on soil samples are shown on the borehole and test pit logs in Appendix A, and generally suggest the absence of gross volatile hydrocarbon impact. All tested samples with the exception of Pit 33/1.3 m (2 ppm) and Pit 41/1.5 m (2 ppm) returned PID results less than the detection limit of 1 ppm. Pit 33/1.3 m was noted to contain coal fines / ash, with Pit 45/1.5 m comprising sand beneath the water table, with the results of laboratory testing indicating the absence of hydrocarbon impact.

Slight hydrocarbon odours were noted for Pits 94, 114 and 115, however, PID values were less than the detection limit of 1 ppm.

Observations of potential contamination in groundwater during well purging and sampling were limited to slight hydrocarbon sheens of the surface of purge water for Wells 5 and 7, and for Well 1 for the first 5 L purged only. Slight sulphuric odours were observed for Wells 1, 3, 8 and 21.

Fibro cement sheeting fragments, potentially containing asbestos, were found at the surface primarily in areas containing former site structures. Areas containing fibro sheeting are indicated on Drawing 1 in Appendix D, together with samples for laboratory analysis.

9.3 Surface Water Testing

During the site inspections of 2 and 5 July 2010 (previous investigation, Ref 11) and the current investigation site inspections on 12 to 13 July 2011, field parameters were tested for surface water samples were collected from drains, surface water bodies and at two discharge points within the Hunter River (i.e. down slope of the site).

The surface waters were tested for pH and Electrical Conductivity using a calibrated hand-held meter, with locations recorded using a handheld GPS. A total of 25 surface water locations were tested, with results shown in Table 7 below, and locations shown on Drawing 1, Appendix D.

Table 7: Results of pH/EC Monitoring of Surface Waters – July 2010 and July 2011

Date	Location	pH	EC (µS/cm)	Description
2 and 5 July 2010 (Ref 11)	S1	4.9	472	Clear / tea stained colour
	S2	4.6	317	Clear / tea stained colour
	S3	5.7	205	Clear / tea stained colour
	S4	6.4	407	Slightly turbid / orange/brown colour, slight rotting organic odour
	S5	7.1	458	Clear / slight yellow / orange colour
	S6 (Hunter River)	7.7	17,300	Slightly turbid / slight white colour
	S7	7.2	576	Clear / slight yellow / brown colour
	S8	7.4	1,711	Slightly turbid / orange/brown colour
	S9	6.9	1245	Clear / slightly yellow / brown
	S10 (Hunter River)	7.5	17,000	Clear
	S11	7.0	657	Clear / slightly yellow / brown
	S12	6.9	480	Clear / Slight tea stained colour
	S13	5.8	158	Clear
	S14	6.0	146	Slightly turbid / brown
	S15	6.6	2,620	Slightly turbid / tea stained colour
12 and 13 July 2011	S16	6.8	3000	Clear / slight orange colour / pooled
	S17	6.7	3360	Clear / slight orange colour
	S18	6.5	5650	Clear / slight orange colour
	S19	6.6	1030	Slightly turbid / orange / H_2S odour / stagnant
	S20	6.3	1860	Slightly turbid / orange / stagnant
	S21	7.1	3550	Clear / Slightly yellow
	S22	6.7	9810	Clear / Slightly yellow
	S23	7.3	851	Slightly turbid / orange / slight waxy sheen on surface
	S24	7.2	1276	Slight turbid / yellow-brown / slight waxy sheen on surface
	S25	6.8	1193	Slight turbid / yellow-brown / waxy sheen on surface

The results of surface water monitoring indicate surface waters within the site are generally neutral to moderately acidic and fresh to moderately brackish. Surface waters tested from the Hunter River were generally slightly basic and saline.

9.4 Groundwater and Surface Water Sampling Field Parameters

Groundwater and surface water parameters measured in the field following purging (once values stabilised) and prior to collection of groundwater samples are presented in Table 8 and Table 9 below.

Table 8: Groundwater Parameters at the Completion of Well Purging

Well Location	Date Sampled	PID Well Headspace (ppm)	PID GW Headspace (ppm)	pH	EC (mS/cm)	Redox Potential (mV)	Turbidity (NTU)	Temp. (°C)	Observations
1	22/08/11	<1	<1	5.1	0.2	248	1497	16.2	Very turbid dark brown, possible slight hydrocarbon sheen to 5L purged
2	23/08/11	<1	5	5.3	0.3	58	400	16.3	Very turbid dark brown
3	23/08/11	<1	14	5.8	0.3	-63	839	14.1	Very turbid dark brown, slight sulphuric odour
4	23/08/11	<1	<1	5.4	0.2	152	1122	16.9	Very turbid dark brown
5	22/08/11	13	3	5.0	0.3	72	364	16.2	Moderately turbid dark brown, slight hydrocarbon sheen
6	22/08/11	11	2	5.7	0.4	8	276	15.0	Moderately turbid grey / brown
7	23/08/11	<1	<1	5.3	0.2	59	1412	12.9	Very turbid grey brown, possible slight hydrocarbon sheen
8	23/08/11	<1	15	5.3	0.4	-1	115	13.7	Moderately turbid yellow brown, slight hydrogen sulphide odour
9	23/08/11	<1	<1	6.9	1.0	-97	180	15.4	Very turbid grey
10-L	22/08/11	<1	<1	5.9	1.2	37	190	16.9	Slightly to moderately turbid grey brown
10-U	22/08/11	<1	<1	6.9	8.8	-96	123	15.5	Slightly to moderately turbid grey brown
11	22/08/11	<1	<1	6.5	0.5	-83	800	14.7	Very turbid grey
12	17/08/11	2	<1	7.0	2.4	-79	2521	15.3	Very turbid grey brown
13	18/08/11	<1	<1	6.7	18.9	-38	208	12.9	Moderately turbid grey brown
14-L	17/08/11	<1	<1	7.3	45.6	-140	100	16.2	Slightly turbid grey
14-U	16/08/11	<1	<1	6.5	14.3	-82	100	14.4	Slightly turbid grey
15-L	18/08/11	<1	<1	5.6	0.8	37	260	15.3	Moderately turbid grey brown
15-U	18/08/11	<1	<1	6.8	1.2	-33	427	12.7	Moderately turbid grey brown
16	18/08/11	<1	<1	6.4	16.0	-6	150	12.9	Slightly to moderately turbid grey brown
17	18/08/11	<1	<1	6.5	15.0	-21	65	13.6	Slightly turbid grey brown
18 *	18/08/11	<1	<1	6.8	0.4	-62	>2600	12.6	Very turbid dark grey, some fine grained sand
20-L	17/08/11	<1	<1	6.9	39.4	-162	241	15.9	Very turbid dark grey
20-U	17/08/11	<1	<1	6.4	22.6	-41	272	14.0	Moderately turbid dark grey
21	23/08/11	<1	<1	6.3	27.2	-61	86	14.8	Slightly turbid grey brown, slight sulphuric odour
22	23/08/11	<1	<1	6.3	19.0	-99	410	15.6	Very turbid grey, slight sulphuric odour

Notes:
EC - Electrical Conductivity
GW - groundwater
NTU - Nephelometric Turbidity Unit
PID - Photoionisation Detector
'-U' suffix denotes well screened in upper clays
'-L' suffix denotes well screened in lower sands
* Well sampled with bailer due to high turbidity (i.e. unsuitable for micropurge technique)

Table 9: Measured Surface Water Field Parameters

Surface Water Location	Date	PID Surface Water Headspace (ppm)	pH	EC (mS/cm)	Redox Potential (mV)	Turbidity (NTU)	Temp. (°C)	Observations
SW121	15/08/2011	<1	8.0	14.4	181	43	17.1	Slightly turbid grey
SW122	15/08/2011	<1	7.5	3.3	173	25	16.9	Slightly turbid yellow
SW123	15/08/2011	<1	7.8	16.5	183	21	17.3	Generally clear
SW124	15/08/2011	<1	7.1	1.7	189	12	15.2	Slightly turbid yellow, trace organics
SW125	15/08/2011	<1	7.7	17.4	197	47	17.6	Slightly turbid grey
SW126	15/08/2011	<1	7.0	0.7	168	50	14.7	Slightly turbid yellow
SW127	15/08/2011	<1	5.9	3.5	202	6	18.0	Slightly turbid
SW128	15/08/2011	<1	6.7	7.9	196	53	18.3	Slightly turbid yellow
SW129	15/08/2011	<1	6.2	4.0	214	15	16.4	Slightly turbid yellow
SW130	15/08/2011	<1	6.7	1.7	178	7	14.0	Slightly turbid yellow
SW131	15/08/2011	<1	6.2	1.4	184	32	18.3	slightly turbid yellow
SW132	15/08/2011	<1	6.9	7.2	139	21	15.5	Slightly turbid yellow, trace organics
SW133	15/08/2011	<1	6.9	1.9	151	24	14.6	Slightly turbid/yellow, trace organics
SW134	15/08/2011	<1	6.8	1.6	-22	31	17.5	Slightly turbid yellow
SW135	15/08/2011	<1	6.7	1.1	58	282	16.6	Moderately turbid dark yellow/brown
SW136	15/08/2011	<1	7.0	0.8	181	13	13.1	Slightly turbid yellow
SW137	15/08/2011	<1	6.3	1.0	125	151	16.8	Slightly turbid yellow
SW138	15/08/2011	<1	6.1	0.4	206	59	13.8	Slightly turbid yellow
SW139	15/08/2011	<1	6.4	0.3	206	25	18.5	Slightly turbid yellow
SW140	15/08/2011	<1	5.5	0.5	219	15	13.7	Slightly turbid yellow
SW141	15/08/2011	<1	6.4	0.1	210	8	16.0	Slightly turbid yellow, trace organics

Notes:
EC - Electrical Conductivity
NTU - Nephelometric Turbidity Unit
PID - Photoionisation Detector

9.5 Laboratory Results for Soil

A total of 21 soil samples from bores and 98 soil samples from test pits were selected to provide an assessment of soil / fill conditions. Of these, two bore and 11 test pit soil replicate samples were tested to achieve the minimum 10% replicate analysis QA/QC objective.

The samples were selected to target the identified potential sources of contamination (see Section 6), with the tested analyte suite targeted accordingly.

The selected samples were analysed for some or all of the following potential contaminants:

- pH;
- Electrical Conductivity (EC);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine / Organophosphorus Pesticides (OCP/OPPs);
- Polychlorinated Biphenyls (PCBs);
- Metals: Arsenic (As), Cadmium (Cd), Chromium (Cr),Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn), Manganese (Mn), Cobalt (Co), Tin (Sn);
- Ammonia;
- Fluoride;
- Phosphorus;
- NOx;
- Total Kjeldahl Nitrogen (TKN);
- Volatile Organic Compounds (VOCs).

The results of chemical analysis undertaken on selected soil samples are included in the attached laboratory report sheets (Appendix B), and are summarised in Table 10 below.

The results of QA/QC testing on soils are presented in Appendix C.

Table 10: Results of Chemical Testing on Soils

Test Location	Depth (m)	PID (ppm)	pH	EC (µS/cm)	Metal											TRH				BTEX				PAH		Total OCPs	Total OPPs	PCBs	Total VOC	NOx	TKN	Ammonia	Fluoride	Total Phosphorus
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Mn	Co	Sn	C_6 - C_9	C_{10} - C_{14}	C_{15} - C_{28}	C_{29} - C_{36}	Benzene	Toluene	Ethyl Benzene	Xylene	Total	Benzo(a) pyrene									
Bore 1	0.05	<1	5.6	66	<4	<0.5	2	7	20	<0.1	1	57	70	<1	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.3	1600	13	2.7	120
Bore 3	0.1	<1	NT	NT	<4	<0.5	3	7	8	<0.1	4	36	36	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<16.6	**1.1**	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 4	0.5	<1	6.9	23	<4	<0.5	<1	<1	1	<0.1	<1	1	3	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Bore 5	0.25	<1	5.1	61	<4	<0.5	<1	3	2	<0.1	<1	19	5	<1	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.94	2100	12	11	32
Bore 6	0.5	<1	NT	NT	<4	<0.5	2	4	5	<0.1	1	64	72	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 7	0.5	<1	5.5	12	<4	<0.5	<1	<1	<1	<0.1	<1	3	1	<1	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Bore 8	0.1	<1	5.4	76	<4	<0.5	4	9	22	<0.1	4	86	81	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<5.03	0.53	<PQL	<PQL	<PQL	NT	NT	NT	NT	9.4	NT
Bore 9	0.1	<1	5.6	88	<4	<0.5	16	22	24	<0.1	14	260	190	11	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	<PQL	NT	NT	NT	3.5	NT
Bore 10	0.5	<1	NT	NT	<4	<0.5	19	12	8	<0.1	18	40	250	11	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 10	1.0	<1	7.9	170	6	<0.5	31	10	10	<0.1	18	34	120	8	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
ALP-D4	1.0	<1	NT	NT	6	<0.5	29	10	10	<0.1	20	33	220	11	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 11	0.25	<1	NT	NT	<4	<0.5	10	13	11	<0.1	12	44	160	4	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.65	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 12	0.5	<1	NT	NT	<4	<0.5	16	22	**1000**	<0.1	18	470	360	9	4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Bore 14	0.25	<1	NT	NT	8	<0.5	43	39	32	<0.1	**60**	95	240	20	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
MJW-D2	0.25	<1	NT	NT	7	<0.5	43	39	44	<0.1	**54**	110	370	22	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Bore 15	0.25	<1	7.5	220	34	<0.5	29	6	13	1.5	30	48	94	21	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	5.2	NT
Bore 16	0.05	<1	6.3	1200	5	<0.5	46	24	15	0.3	38	48	200	15	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	26	NT	NT
Bore 17	0.05	<1	5.8	130	<4	<0.5	33	30	24	0.2	37	140	460	18	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	3.2	NT	NT
Bore 18	0.05	<1	NT	NT	6	<0.5	31	30	27	0.2	33	160	320	12	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 19	0.05	<1	5.7	400	9	<0.5	31	23	23	0.2	**43**	110	690	39	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	0.94	NT
Bore 21	0.05	<1	3.9	360	9	<0.5	17	17	17	0.2	14	47	97	9	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	67	NT	NT
Bore 22	0.25	<1	4.7	290	8	<0.5	32	23	17	0.1	33	84	230	21	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	18	NT	NT
Pit 23	0.25	<1	NT	NT	<4	<0.5	4	21	76	<0.1	5	89	28	4	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<10.58	0.68	<PQL	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT
Pit 23	1.4	<1	NT	NT	<4	<0.5	<1	1	2	<0.1	<1	39	3	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 24	0.1	<1	NT	NT	<4	<0.5	5	12	28	0.1	5	73	76	1	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<3.12	0.22	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 25	0.05	<1	NT	NT	<4	<0.5	2	16	9	<0.1	2	54	120	4	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 26	0.25	<1	7.5	56	<4	<0.5	4	14	70	0.2	3	100	170	2	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	3.6	NT
Pit 27	0.05	<1	NT	NT	<4	<0.5	2	1	15	<0.1	1	38	360	2	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 28	0.25	<1	NT	NT	<4	<0.5	10	10	76	<0.1	10	270	190	5	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<2.09	0.09	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 29	0.05	<1	6.1	43	<4	<0.5	3	2	15	<0.1	2	34	34	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	<0.5	460	6.2	2.9	200
Pit 30	0.05	<1	NT	NT	<4	<0.5	1	1	2	<0.1	<1	22	23	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
ALP-D30	0.05	<1	NT	NT	<4	<0.5	<1	<1	1	<0.1	<1	16	13	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 31	0.5	<1	5.9	89	6	<0.5	24	30	53	0.2	34	260	1200	38	7	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.57	0.07	NT	NT	NT	NT	<0.5	2800	19	NT	1800
ALP-D32	0.5	<1	5.9	93	7	<0.5	29	35	56	0.2	**41**	280	1300	43	9	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	<0.5	2700	14	NT	2100
Pit 32	0.1	<1	6.5	52	<4	0.9	7	61	**1000**	0.2	9	830	200	3	7	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.57	0.07	<PQL	<PQL	<PQL	NT	<0.5	640	1.4	NT	380
Pit 33	1.3	2	NT	NT	<4	<0.5	31	17	7	0.1	8	13	18	1	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT
Pit 34	0.1	<1	NT	NT	<4	<0.5	1	7	3	<0.1	8	98	12	4	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT
Pit 35	0.25	<1	NT	NT	<4	<0.5	1	3	4	<0.1	<1	210	1	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT
Pit 36	0.07	<1	NT	NT	<4	<0.5	2	6	11	<0.1	2	18	76	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 38	0.5	<1	NT	NT	<4	<0.5	<1	4	9	<0.1	1	69	41	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 39	0.3	<1	NT	NT	<4	<0.5	4	13	**110**	<0.1	4	180	220	2	3	<25	<50	180	<100	<0.2	<0.5	<1	<3	<1.67	0.07	<PQL	<PQL	<PQL	NT	<0.5	2300	7.2	NT	460
Pit 40	0.1	<1	NT	NT	<4	<0.5	<1	2	6	<0.1	<1	24	12	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	0.05	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 41	0.25	<1	NT	NT	<4	1.2	3	9	100	<0.1	4	90	210	2	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<5.22	0.42	<PQL	<PQL	<PQL	NT	<0.5	1800	8.9	NT	1200
Pit 42	0.25	<1	NT	NT	6	<0.5	2	26	7	<0.1	4	14	12	4	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 43	0.05	<1	NT	NT	<4	<0.5	2	4	21	<0.1	1	80	1800	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 44	0.5	<1	5.9	30	<4	<0.5	3	1	11	<0.1	1	34	10	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	<0.5	400	5.7	NT	220
Pit 45	0.05	<1	NT	NT	<4	<0.5	4	8	61	<0.1	2	160	130	<1	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 46	0.25	<1	NT	NT	<4	<0.5	<1	2	1	<0.1	<1	39	11	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 47	0.25	<1	NT	NT	<4	<0.5	18	<1	8	<0.1	2	4	21	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 48	0.1	<1	NT	NT	<4	<0.5	5	18	**170**	<0.1	4	130	130	1	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<12.38	**0.88**	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 52	0.25	<1	NT	NT	8	<0.5	29	28	36	<0.1	15	140	61	6	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	<0.5	2900	24	NT	690
Pit 52	0.5	<1	5.8	4	<4	<0.5	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	NT	NT	NT	NT	<0.5	63	1.5	NT	<10
ALP-D13	0.5	<1	5.7	6	<4	<0.5	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	NT	NT	NT	NT	<0.5	50	1.2	NT	<10
Pit 53	0.1	<1	NT	NT	<4	<0.5	7	11	49	<0.1	5	76	270	4	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<2.65	0.15	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 54	0.1	<1	NT	NT	<4	<0.5	2	3	8	<0.1	1	28	270	2	<1	<25	<50	**8800**	**3500**	<0.2	<0.5	<1	<3	**<6376.9**	**390**	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 56	0.1	<1	NT	NT	<4	<0.5	<1	2	1	<0.1	<1	14	6	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 57	0.25	<1	NT	NT	<4	<0.5	<1	5	3	<0.1	<1	300	29	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 59	0.1	<1	4.3	110	<4	<0.5	5	13	20	<0.1	5	61	57	3	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.7	NT
Pit 61	0.25	<1	NT	NT	22	<0.5	2	11	23	0.4	3	16	21	1	1	<25	<50	120	<100	<0.2	<0.5	<1	<3	<3.68	0.08	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 62	0.05	<1	NT	NT	<4	<0.5	<1	3	5	<0.1	<1	24	6	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 63	0.05	<1	NT	NT	5	<0.5	29	24	42	<0.1	36	220	1000	38	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 64	0.1	<1	NT	NT	<4	<0.5	3	<1	10	<0.1	<1	32	360	2	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 65	0.5	<1	NT	NT	12	1	7	22	**250**	<0.1	10	1500	100	4	51	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<2.29	0.19	<2.2	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 66	0.25	<1	NT	NT	<4	<0.5	1	3	5	<0.1	<1	24	30	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 68	0.05	<1	NT	NT	11	<0.5	3	9	15	<0.1	5	43	160	2	2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
ALP-D34	0.05	<1	NT	NT	10	<0.5	2	7	15	<0.1	4	39	120	2	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 69	0.05	<1	NT	NT	<4	<0.5	6	9	30	<0.1	4	55	140	2	2	NT	NT	NT	NT	NT	NT	NT	NT	0	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
ALP-D37	0.05	<1	NT	NT	<4	<0.5	6	9	35	<0.1	4	59	150	2	2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Laboratory PQL			-	1	4	0.5	1	1	1	0.1	1	1	1	1	1	25	50	100	100	0.2	0.5	1	2	1.55	0.05	0.1	0.1	0.1	57.7	0.5	10	0.5	0.5	10
NSW EPA - NEHF [2]			NC	NC	500	100	500	5000	1500	75	3000	35000	7500	500	NC	NC				NC				NC	NC	NC	NC	100	5	NC	NC	50	NC	1000	NC	NC	NC
NSW EPA Criteria for Service Station Sites [3]			NC	NC	NC	NC	NC	NC	300	NC	NC	NC	NC	NC	NC	65	1000 total			1	1.4/130[4]	3.1/50[4]	14/25[4]	20	1	NC	NC	NC	NC	NC	NC	NC	NC	NC
NSW EPA - General Solid Waste Guidelines - CT1			NC	NC	100	20	100	NC	100	4	40	NC	NC	NC	NC	650 SCC1	10000 total SCC1			10	288	600	1000	200 SCC1	0.8	NC	NC	50 SCC1	NC	NC	NC	NC	3000	NC
NSW EPA - Restricted Solid Waste Guidelines - CT2			NC	NC	400	80	400	NC	400	16	160	NC	NC	NC	NC	2600 SCC2	40000 total SCC2			40	1152	2400	4000	800 SCC2	3.2	NC	NC	50 SCC2	NC	NC	NC	NC	12000	NC

Table 10: Results of Chemical Testing on Soils (Continued)

Test Location	Depth (m)	PID (ppm)	pH	EC (µS/cm)	Metal											TRH				BTEX				PAH		Total OCPs	Total OPPs	PCBs	Total VOC	NOx	TKN	Ammonia	Fluoride	Total Phosphorus
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Mn	Co	Sn	C_6 - C_9	C_{10} - C_{14}	C_{15} - C_{28}	C_{29} - C_{36}	Benzene	Toluene	Ethyl Benzene	Xylene	Total	Benzo(a) pyrene									
Pit 72	0.05	<1	5.8	110	5	<0.5	24	17	8	0.1	30	69	350	19	<1	NT	NT	NT	NT	NT	NT	NT	NT	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
ALP-D36	0.05	<1	5.6	100	5	<0.5	23	14	8	<0.1	23	43	220	12	4	NT	NT	NT	NT	NT	NT	NT	NT	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 75	0.05	<1	NT	NT	<4	<0.5	11	10	18	<0.1	10	110	260	7	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 76	0.05	<1	NT	NT	12	<0.5	12	19	13	<0.1	12	59	230	7	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<2.04	0.14	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 78	0.05	<1	NT	NT	<4	<0.5	5	7	6	<0.1	5	47	280	3	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<17.2	**2.2**	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 79	0.05	<1	NT	NT	<4	<0.5	7	7	12	<0.1	8	56	240	6	<1	<25	<50	4600	2000	<0.2	<0.5	<1	<3	**<2938.5**	**160**	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 81	0.1	<1	NT	NT	<4	<0.5	6	13	7	<0.1	6	34	84	3	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<3.28	0.18	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 81	0.2	<1	NT	NT	7	<0.5	4	10	4	<0.1	6	28	67	4	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.76	0.06	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 82	0.05	<1	5.6	360	8	<0.5	38	25	17	0.2	**54**	89	430	32	1	NT	NT	NT	NT	NT	NT	NT	NT	<1.75	0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 83	0.05	<1	6	1200	7	<0.5	32	31	25	<0.1	36	120	240	13	1	<50	<100	<200	<200	<0.4	<1	<2	<6	<3.1	<0.1	NT	NT	NT	NT	<0.5	6400	47	1.6	670
Pit 85	0.05	<1	NT	NT	<4	<0.5	31	49	48	<0.1	13	300	300	8	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<2.86	0.26	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 86	0.25	<1	NT	NT	<4	<0.5	2	18	5	<0.1	2	22	23	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
KGP-D2	0.25	<1	NT	NT	<4	<0.5	2	20	4	<0.1	2	27	22	1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 87	0.25	<1	NT	NT	<4	<0.5	3	<1	11	<0.1	2	34	420	2	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	<PQL	NT	NT	NT	NT	NT	NT
Pit 88	0.05	<1	NT	NT	6	<0.5	36	25	21	0.2	32	230	230	15	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 89	0.05	<1	NT	NT	<4	<0.5	8	6	5	<0.1	7	68	66	3	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
KGP-D4	0.05	<1	NT	NT	<4	<0.5	4	3	4	<0.1	3	35	31	1	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 91	0.05	<1	6.5	420	4	<0.5	18	28	23	<0.1	28	170	550	15	1	<50	<100	<200	<200	<0.4	<1	<2	<6	<17.1	**1.3**	NT	NT	NT	<PQL	NT	NT	62	NT	NT
KGP-D6	0.05	<1	6.6	410	<4	<0.5	17	27	23	<0.1	26	170	570	15	1	<50	<100	<200	<200	<0.4	<1	<2	<6	<6.69	0.39	NT	NT	NT	<PQL	NT	NT	50	NT	NT
Pit 92	0.25	<1	7.2	450	8	<0.5	37	50	29	<0.1	**45**	350	370	19	3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<5.66	0.46	NT	NT	NT	<PQL	NT	NT	26	NT	NT
Pit 93	0.05	<1	7.4	430	12	<0.5	30	10	14	0.2	34	48	250	22	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	14	NT	NT
Pit 94	0.25	<1	6.2	46	5	<0.5	4	11	6	<0.1	8	36	370	8	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	3.8	NT	NT
Pit 95	0.05	<1	5.1	450	<4	<0.5	10	11	**150**	<0.1	8	38	46	3	2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	NT	NT	NT	<PQL	NT	NT	8.7	NT	NT
Pit 96	0.25	<1	5.1	900	5	<0.5	47	23	15	0.1	39	65	98	14	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	0.6	NT
KGP-D5	0.25	<1	5.3	930	<4	<0.5	39	15	12	<0.1	18	43	67	8	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	<0.5	NT
Pit 97	0.05	<1	NT	NT	6	<0.5	40	12	13	0.2	37	79	290	24	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 98	0.05	<1	6.3	160	15	<0.5	40	35	22	0.4	**47**	81	94	16	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1.1	NT
Pit 99	0.25	<1	NT	NT	21	<0.5	33	26	17	0.4	**55**	62	90	18	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 100	0.05	<1	5.5	220	16	<0.5	34	31	24	0.3	**51**	100	260	24	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1.6	NT
Pit 101	0.25	<1	NT	NT	19	<0.5	37	9	13	0.4	19	46	78	8	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 102	0.25	<1	6	840	<4	<0.5	38	12	11	0.1	19	45	100	10	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1.4	NT
Pit 103	0.05	<1	NT	NT	6	<0.5	38	29	22	0.1	**51**	98	210	18	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 104	0.25	<1	5.3	90	5	<0.5	31	18	14	0.1	22	49	220	9	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	<0.5	NT
Pit 105	0.05	<1	NT	NT	6	<0.5	29	21	18	0.1	31	72	780	23	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 106	0.05	<1	NT	NT	7	<0.5	40	44	21	<0.1	**65**	89	250	25	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1.55	<0.05	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 107	0.25	<1	6.6	850	6	<0.5	32	17	14	<0.1	32	50	340	19	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1.4	NT
Pit 108	0.05	<1	NT	NT	6	<0.5	34	25	20	0.1	**41**	99	350	19	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 109	0.05	<1	5.9	130	5	<0.5	28	26	19	0.1	30	86	510	15	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1.1	NT
Pit 110	0.25	<1	NT	NT	5	<0.5	25	18	14	0.2	24	41	480	13	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT
Pit 111	0.05	<1	6.4	160	10	<0.5	30	23	19	0.2	**44**	85	510	32	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	5.8	NT
Pit 112	0.05	<1	5.5	190	8	<0.5	28	30	27	0.1	32	170	360	16	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<10.5	**1.2**	<PQL	<PQL	NT	NT	NT	NT	NT	5.7	NT
Pit 113	0.45	<1	5.2	130	<4	0.6	38	32	37	<0.1	22	1000	120	6	1	<50	<100	<200	<200	<0.4	<1	<2	<6	NT	NT	<PQL	<5.2	NT	NT	NT	NT	NT	1.9	NT
Pit 114	0.05	<1	5.4	92	<4	<0.5	4	7	16	<0.1	4	56	16	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	4.7	NT
KGP-D3	0.05	<1	5.5	92	<4	<0.5	3	5	12	<0.1	3	31	9	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	4.7	NT
Pit 115	0.25	<1	6.3	72	<4	<0.5	3	7	8	<0.1	2	28	43	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1	NT
Pit 116	0.05	<1	5.3	17	<4	<0.5	2	4	9	<0.1	1	30	48	<1	<1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	3.8	NT
Pit 117	0.25	<1	5.3	19	<4	<0.5	2	2	2	<0.1	<1	6	11	<1	<1	<25	<50	<100	270	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	2.8	NT
Pit 118	0.05	<1	6.2	190	5	<0.5	34	29	25	<0.1	35	170	380	17	1	<50	<100	<200	<200	<0.4	<1	<2	<6	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	5.9	NT
Pit 119	0.05	<1	5.9	180	5	<0.5	33	25	18	<0.1	36	80	410	21	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	3.1	NT
Pit 120	0.25	<1	6	83	5	<0.5	30	21	11	<0.1	35	57	430	19	1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	1	NT
Laboratory PQL			-	1	4	0.5	1	1	1	0.1	1	1	1	1	1	25	50	100	100	0.2	0.5	1	2	1.55	0.05	0.1	0.1	0.1	57.7	0.5	10	0.5	0.5	10
NSW EPA - NEHF F [4]			NC	NC	500	100	500	5000	1500	75	3000	35000	7500	500	NC	NC	NC			NC	NC	NC	NC	NC	100	5	NC	NC	50	NC	1000	NC	NC	NC	NC
NSW EPA Criteria for Service Station Sites [3]			NC	NC	NC	NC	NC	NC	300	NC	NC	NC	NC	NC	NC	65	1000 total			1	1.4/130[1]	3.1/50[1]	14/25[1]	20	1	NC	NC	NC	NC	NC	NC	NC	NC	NC
NSW EPA - General Solid Waste Guidelines - CT1			NC	NC	100	20	100	NC	100	4	40	NC	NC	NC	NC	650 SCC1	10000 total SCC1			10	288	600	1000	200 SCC1	0.8	NC	NC	50 SCC1	NC	NC	NC	NC	3000	NC
NSW EPA - Restricted Solid Waste Guidelines - CT2			NC	NC	400	80	400	NC	400	16	160	NC	NC	NC	NC	2600 SCC2	40000 total SCC2			40	1152	2400	4000	800 SCC2	3.2	NC	NC	50 SCC2	NC	NC	NC	NC	12000	NC

Notes:
All results in mg/kg on a dry weight basis unless otherwise stated
NC - No Criteria
NT - Not Tested
PID - Photoionisation Detector
PQL - Practical Quantitation Limits
SCC - Specific Contaminant Concentration
Total PAH - Sum of positive PAH
ALP-D13 - replicate sample of Pit 52 m
ALP-D30 - replicate sample of Pit 30 m
ALP-D32 - replicate sample of Pit 31 m
ALP-D34 - replicate sample of Pit 68 m
ALP-D36 - replicate sample of Pit 72 m
ALP-D37 - replicate sample of Pit 69 m
ALP-D4 - replicate sample of Bore 10/1.0 m
KGP-D2 - replicate sample of Pit 86 m
KGP-D3 - replicate sample of Pit 114/0.05 m
KGP-D4 - replicate sample of Pit 89/0.05 m
KGP-D5 - replicate sample of Pit 96/0.25 m
KGP-D6 - replicate sample of Pit 91/0.05 m
MJW-D2 - replicate sample of Bore 14/0.25 m
1 - Human Health Based Protection Level.
2 - Health Based Criteria for Commercial/Industrial Land Uses
3 - Threshold Concentration for Sensitive Land Use
SCC - Specific Contmainant Concentreation
CT - Concentration Threshold
Total PAH - sum of positive and PQL Values (Conservative)
Total OCP - sum of positive and PQL Values (Conservative)
Total OPP - sum of positive and PQL Values (Conservative)
Total VOC - sum of positive and PQL Values (Conservative)
Exceeds NSW EPA Health-Based Criteria for Industrial/Commercial Landuse
Exceeds NSW EPA Criteria for Sensitive Landuse (TRH/BTEX)
Bold results exceed NSW DECCW General Solid Waste Classification Guidelines without additional leachability testing
Bold & underlined results exceed NSW DECCW Restricted Solid Waste Classification Guidelines without additional leachability testing

9.6 Acid Sulphate Soils

A total of 129 samples collected from 27 bores or pits were tested for pH in water (pH_F), and pH in water following oxidation (pH_{FOX}) with hydrogen peroxide (H_2O_2), using a calibrated pH meter in the DP laboratory. These screening tests were undertaken with reference to the *NSW Acid Sulphate Soil Management Advisory Committee (ASSMAC),Acid Sulphate Soil Manual* (Ref 17).

Based on the results of these screening tests, 30 of these soil samples were selected for detailed laboratory testing comprising the Chromium Suite with reference to the QASSIT guidelines (Ref 1). Laboratory testing was undertaken by Envirolab Services Pty Ltd (Envirolab), a NATA-registered laboratory.

The results of these screening tests and Chromium Suite testing are presented in Table 11 below. Detailed test results and the analytical methods used for Chromium are shown on the laboratory sheets in Appendix C.

Table 11: Results of Acid Sulphate Soil Screening Tests and Chromium Suite Testing

Sample ID	Sample Depth [a] (m)	Sample Description	Screening Test Results				Laboratory Results						
			pH			Strength of Reaction [b]	pH_{KCL}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	s-C_{IN} %S	Net Acidity[c] %S
			pH_F	pH_{FOX}	pH_F-pH_{FOX}								
Bore 2	0.1	Sand	7.4	4.5	2.9	2, F	NT	NT	NT	NT	NT	NT	NA
	0.25	Sand	7.4	4.3	3.1	2, F	5.3	0.01	0.01	<0.005	<0.05	NA	0.03
	0.5	Sand	7.5	5.1	2.4	1-2	NT	NT	NT	NT	NT	NT	NA
	1.0	Sand	6.6	5.8	0.8	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.8	4.6	2.2	1	5.7	0.02	0.10	<0.005	<0.05	NA	0.12
Bore 3	0.5	Sand	7.5	3.3	4.2	1, C	NT	NT	NT	NT	NT	NT	NA
	1.0	Sand	6.3	3.2	3.1	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.4	2.8	3.6	1, C	4.7	0.06	0.02	<0.005	<0.05	NA	0.08
	3-3.45	Sand	6	2.8	3.2	1, C	NT	NT	NT	NT	NT	NT	NA
Bore 5	0.25	Filling	5.5	3.9	1.6	1	NT	NT	NT	NT	NT	NT	NA
	0.5	Sand	5.9	4.3	1.6	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Sand	5.5	4.5	1	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	5.6	4.1	1.5	1	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Sand	6.4	3.9	2.5	1	5.3	0.01	0.01	<0.005	<0.05	NA	0.03
Bore 6	0.5	Sand	5.7	4.7	1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Sand	5.9	4.8	1.1	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.2	5.5	0.7	1	NT	NT	NT	NT	NT	NT	NA
	3.2-3.65	Sand	6.7	2.8	3.9	1-2, F, C	5.1	0.06	<0.01	<0.005	<0.05	NA	0.07
Bore 8	0.25	Filling	5.6	2.9	2.7	1, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Sand	5.7	3	2.7	1, F	4.7	0.02	0.02	<0.005	<0.05	NA	0.04
	1.0	Sand	5.6	4	1.6	1, C	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.1	3.6	2.5	1, C	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Sand	5.9	2.8	3.1	1	5.0	0.04	0.01	<0.005	<0.05	NA	0.05
Bore 9	0.1	Filling	5.8	4	1.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Filling	6.2	4.1	2.1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Filling	6.9	5.1	1.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.8	Filling	6.6	5.4	1.2	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.9-2.0	Clay	6.6	5.3	1.3	1-2, F	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Clay	6.1	3.9	2.2	3, F, H, O	NT	NT	NT	NT	NT	NT	NA
Bore 10	0.1	Filling	6.2	3.9	2.3	1-2, F	5.1	0.02	0.01	0.009	<0.05	NA	0.04
	0.5	Filling	6.2	6.1	0.1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clayey sand	7.4	6.6	0.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Clayey sand	7.4	6.5	0.9	1	NT	NT	NT	NT	NT	NT	NA
	3.0	Clay	6.8	6.4	0.4	1-2, F	NT	NT	NT	NT	NT	NT	NA
	4.5-4.95	Sandy clay	7.1	6.5	0.6	1, F	NT	NT	NT	NT	NT	NT	NA
	6.0	Sand	7.7	4.1	3.6	1, C	NT	NT	NT	NT	NT	NT	NA
	8.0	Sand	6.1	3.1	3	1, C	5.7	0.02	<0.01	<0.005	<0.05	NA	0.03
Bore 11	0.5	Clay	6.9	6.8	0.1	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Clayey sand	7.3	4.8	2.5	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Clay	7.2	2.7	4.5	4, F, H	7.9	0.25	<0.01	<0.005	0.95	NA	<0.01
	3-3.45	Sand	6.1	2.8	3.3	1	NT	NT	NT	NT	NT	NT	NA
Bore 12	1	Clay	7	4.1	2.9	2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sandy clay	6.5	4.4	2.1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Clay	8.2	2.8	5.4	4, F, H	6.4	0.86	<0.01	<0.005	<0.05	NA	0.86
Bore 13	0.05	Silty clay	7.2	4.1	3.1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Sandy clay	7.4	6.6	0.8	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Sandy clay	7	6.6	0.4	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Silty clay	7.6	2.8	4.8	4, F, H	8.0	0.46	<0.01	<0.005	1.60	NA	<0.01
	3-3.45	Silty clay, shells	8.7	7.4	1.3	1-2, F	NT	NT	NT	NT	NT	NT	NA
Bore 14	0.5	Silty clay	7	5.1	1.9	1	4.8	0.02	0.02	0.011	<0.05	NA	0.05
	1.0	Clayey sand	7	5.3	1.7	1, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.8	6.1	0.7	1	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Clay	7.4	6.6	0.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	4.5-4.95	Clay	8.1	7.3	0.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	6-6.45	Clay	8.2	7.6	0.6	1-2, F	NT	NT	NT	NT	NT	NT	NA
	7.5-7.95	Clayey sand	8.7	7.4	1.3	1, F	NT	NT	NT	NT	NT	NT	NA
	9-9.45	Clayey sand	8.4	2.3	6.1	1, F, C	NT	NT	NT	NT	NT	NT	NA
Bore 15	0.05	Silty clay	7	3.6	3.4	2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Silty clay	7.3	6.8	0.5	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clayey sand	7.2	6.6	0.6	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Clayey sand	7.1	2.4	4.7	1	7.8	0.25	<0.01	<0.005	0.47	NA	<0.01
	3-3.45	Clayey sand	9.5	7.2	2.3	1	NT	NT	NT	NT	NT	NT	NA

Table 11: Results of Acid Sulphate Soil Screening Tests and Chromium Suite Testing (Cont'd)

Sample ID	Sample Depth [a] (m)	Sample Description	Screening Test Results				Laboratory Results						
			pH			Strength of Reaction [b]	pH_{KCL}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	s-C_{IN} %S	Net Acidity[c] %S
			pH_F	pH_{FOX}	pH_F-pH_{FOX}								
Bore 16	0.05	Silty clay	6.8	4.8	2	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.25	Clay	6.4	4.8	1.6	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Clay	6.2	5.1	1.1	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Sandy clay	6	4.2	1.8	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sandy clay	5.9	2.5	3.4	3-4, F, H	6.5	0.34	<0.01	<0.005	<0.05	NA	0.33
	3-3.45	Silty clay	7.9	5.1	2.8	2-3, F	NT	NT	NT	NT	NT	NT	NA
Bore 17	0.05	Silty clay	8.3	4.3	4	1, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Sand	7.5	4.8	2.7	1, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Sand	6.8	4.4	2.4	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sand	6.5	2.6	3.9	1, F	5.4	0.09	<0.01	<0.005	<0.05	NA	0.10
	3-3.45	Silty clay	6.9	5.9	1	1, F	NT	NT	NT	NT	NT	NT	NA
Bore 18	0.05	Silty clay	6.4	4.1	2.3	1, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Silty clay	7.2	5.1	2.1	1, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clayey sand	6.5	3.8	2.7	1, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sandy clay	6.8	2.6	4.2	1, F	4.9	0.31	0.10	<0.005	<0.05	NA	0.41
	3-3.45	Sandy clay	7.2	3.2	4	1, F	NT	NT	NT	NT	NT	NT	NA
Bore 20	0.05	Silty clay	6.2	3.9	2.3	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Silty clay	7.2	4.8	2.4	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Sandy clay	5.5	4.2	1.3	1	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Sandy clay	6.2	2.4	3.8	3-4, F, H, O, C	4.4	0.96	0.04	0.007	<0.05	NA	1.00
	3-3.45	Silty clay	7.5	6	1.5	1-2, F	NT	NT	NT	NT	NT	NT	NA
	6-6.45	Sandy clay	8.3	7.1	1.2	1, F	NT	NT	NT	NT	NT	NT	NA
	7.5-7.95	Clayey sand	8.5	7.4	1.1	1	NT	NT	NT	NT	NT	NT	NA
	9-9.45	Sand	8.4	2.7	5.7	1, C	7.4	0.06	<0.01	<0.005	0.07	0.21	0.01
Bore 21	0.05	Silty clay	4.4	2.1	2.3	2, F	3.3	0.01	0.32	0.42	<0.05	NA	0.75
	0.5	Silty clay	4.5	2.9	1.6	4, F, H	NT	NT	NT	NT	NT	NT	NA
	1.0	Silty clay	5.8	3.3	2.5	2, F, C	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Silty clay	5.7	2.4	3.3	4, F, H	NT	NT	NT	NT	NT	NT	NA
	3-3.45	Silty clay	8.3	6.7	1.6	3-4, F, H	NT	NT	NT	NT	NT	NT	NA
Bore 22	0.05	Silty clay	6.3	2.9	3.4	2, F	NT	NT	NT	NT	NT	NT	NA
	0.5	Silty clay	4.4	2.6	1.8	2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Silty clay	5.7	2.9	2.8	2, F	NT	NT	NT	NT	NT	NT	NA
	1.5-1.95	Silty clay	6.4	2.6	3.8	4, F, H	5.8	0.48	<0.01	<0.005	<0.05	NA	0.49
Pit 30	0.25	Clay	7.6	5.7	1.9	4, F, H	NT	NT	NT	NT	NT	NT	NA
	0.5	Clay	7.1	5.5	1.6	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clay	7.3	6.3	1	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.5	Clay	7.3	6.8	0.5	1	NT	NT	NT	NT	NT	NT	NA
Pit 63	0.25	Topsoil, clay	7.4	4	3.4	2, F	5.1	0.007	0.01	0.006	<0.05	NA	0.03
	0.5	Clay	6.9	6.2	0.7	1-2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clay	6.9	6.8	0.1	1	NT	NT	NT	NT	NT	NT	NA
	1.5	Clay	7.1	6.8	0.3	1	NT	NT	NT	NT	NT	NT	NA
Pit 70	0.25	Sand	5.8	3	2.8	1	4.4	<0.005	0.02	<0.005	<0.05	NA	0.03
	0.5	Sand	5.8	4	1.8	1	NT	NT	NT	NT	NT	NT	NA
	1.0	Clayey sand	6.1	5.4	0.7	1	NT	NT	NT	NT	NT	NT	NA
	1.5	Clayey sand	6.5	5	1.5	1	5.1	<0.005	0.01	<0.005	<0.05	NA	0.01
Pit 71	0.05	Filling	6.7	3.3	3.4	2, F	5.0	0.01	0.01	0.007	<0.05	NA	0.03
	0.25	Clay	6.2	3.5	2.7	2, F	4.9	0.006	0.01	0.006	<0.05	NA	0.02
	0.5	Clay	6.7	3.9	2.8	2, F	NT	NT	NT	NT	NT	NT	NA
	1.0	Clay	8.3	7.3	1	3-4, F, H	NT	NT	NT	NT	NT	NT	NA
	1.3	Clay	8.2	6	2.2	1	NT	NT	NT	NT	NT	NT	NA
	1.5	Sand	7.3	6.5	0.8	1	NT	NT	NT	NT	NT	NT	NA
Pit 74	0.05	Topsoil, clay	6.4	4	2.4	2-3, F, H	NT	NT	NT	NT	NT	NT	NA
	0.25	Clay	6.4	4.9	1.5	3-4, F, H	NT	NT	NT	NT	NT	NT	NA
	0.5	Clay	6.7	4.8	1.9	2-3, F, H	NT	NT	NT	NT	NT	NT	NA
	1.0	Clay	6.8	6.5	0.3	4, F, H	NT	NT	NT	NT	NT	NT	NA
Pit 78	0.5	Filling	7.8	7.8	0	4, F, H	NT	NT	NT	NT	NT	NT	NA
	1.0	Clay	7.8	7.3	0.5	2, F	NT	NT	NT	NT	NT	NT	NA
	1.5	Clay	7.8	4.8	3	2-3, F, H	6.0	0.006	<0.01	<0.005	<0.05	NA	0.01
Pit 90	0.05	Silt and organics	5	3.2	1.8	4, F, H, C	NT	NT	NT	NT	NT	NT	NA
	0.25	Silty clay	6.4	3	3.4	4, F, H, C	4.1	0.01	0.06	0.023	<0.05	NA	0.10
	0.45	Clay	4.7	2.9	1.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
Pit 98	0.05	Silty clay	6.9	4.5	2.4	2-3, F	5.4	0.007	0.01	0.014	<0.05	NA	0.04
	0.25	Clay	6.6	5.5	1.1	2-3, F	NT	NT	NT	NT	NT	NT	NA
	0.45	Clay	6.8	5.3	1.5	2-3, F	NT	NT	NT	NT	NT	NT	NA
Pit 117	0.05	Silty sand	5.8	2.9	2.9	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.25	Silty sand	5.6	2.8	2.8	1-2, F	NT	NT	NT	NT	NT	NT	NA
	0.45	Silty sand	5.7	3.3	2.4	1-2, F	4.7	<0.005	0.01	<0.005	<0.05	NA	0.02
Guideline		Sands to loamy sands	<4[d]	<3.5[e]	≥1[e]	-	-	-	-	-	-	-	0.03
		Sandy loams to light clays											0.06[f]/0.03[g]
		Medium to heavy clays & silty clays											0.1[f]/0.03[g]

Notes:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- H denotes heat generated

c Net acidity calculated by the laboratory using raw data

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material (Ref 7)

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material (Ref 7)

Shaded results indicate an exceedence of ASSMAC/QASSMAC criteria

pHF - Soil pH Test (1:5 soil:distilled water)

pHFOX - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_2O_2))

NA - Not applicable

The ASSMAC guidelines (Ref 17) suggest that a soil pH<4 in water is an indicator of actual acid sulphate soils. The results of screening tests therefore suggest the absence of actual acid sulphate soils at the locations and depths tested.

The ASSMAC guidelines also suggest that indicators of potential acid sulphate soils (PASS) include the following:

- Soil pH less than 3.5 following oxidation with H_2O_2 (i.e. pH_{FOX});
- Drop of 1 pH unit or more between pH_F and pH_{FOX}.

The majority of samples exhibited a pH drop of greater than or equal to one unit, and of these samples 37 also exhibited a soil pH following oxidation below pH 3.5. The results of screening tests generally suggest that the natural clays and sands are PASS.

It is noted that the acid sulphate soil screening tests are a qualitative method only and give an indication of the intensity of total acidification (pH). The ASSMAC guidelines indicate that peroxide may also oxidise organic matter (in addition to pyrite) to produce acids which are unlikely to form under natural conditions, thus giving falsely high indication of acid sulphate potential.

Based on the results of the screening tests, 30 soil samples were selected for detailed laboratory testing, comprising the Full Chromium Suite in accordance with QASSIT guidelines.

The results of detailed laboratory analysis indicate that potential acid sulphate soils are present within the site, with Net Acidity values above the QASSIT action criteria (Ref 7) for disturbance of more than 1000 tonnes of material, for 22 of the 30 samples tested.

9.7 Asbestos in Soil

Testing for the presence of asbestos materials was undertaken by Envirolab Services Pty Ltd, a NATA-registered laboratory, as follows:

- Testing of 17 soil samples collected from bores / pit soil samples;
- Testing of 12 cement sheeting / fibro fragments (Fibro1 to Fibro12) sampled at the surface;
- Testing of surface soils directly beneath eight of the above cement sheeting / fibro fragments.

The results are shown below in Table 12 and Table 13.

Table 12: Laboratory Results for Asbestos in Soil

Location/ Depth (m)	Sample Type	Result
Pit 26/0.25	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 28/0.25	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 29/0.5	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 30/0.05	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 34/0.1	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 39/0.3	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 45/0.05	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 46/0.25	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 48/0.1	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 49/0.1	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 53/0.1	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 56/0.1	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 61/0.25	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 65/0.5	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 68/0.05	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 78/0.05	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
Pit 92/0.25	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F1* (soil below Fragment F1)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F2* (soil below Fragment F2)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F3* (soil below Fragment F3)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F4* (soil below Fragment F4)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F7* (soil below Fragment F7)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F8* (soil below Fragment F8)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F9* (soil below Fragment F9)	Soil	No asbestos detected at reporting limit of 0.1 g/kg. No respirable fibres detected.
F11* (soil below Fragment F11)	Soil	**Chrysotile asbestos detected.** No respirable fibres detected.

Table 13: Laboratory Results for Asbestos in Cement Sheeting

Sample ID	Sample Type	Result
Fibro1	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**
Fibro2	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**
Fibro3	Cement sheeting fragment	**Chrysotile asbestos detected.**
Fibro4	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**
Fibro5	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**
Fibro6	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**
Fibro7	Cement sheeting fragment	**Chrysotile asbestos detected.**
Fibro8	Cement sheeting fragment	**Chrysotile asbestos detected.**
Fibro9	Cement sheeting fragment	**No asbestos detected.**
Fibro10	Cement sheeting fragment	**Chrysotile asbestos detected.**
Fibro11	Cement sheeting fragment	**Chrysotile asbestos detected.**
Fibro12	Cement sheeting fragment	**Chrysotile asbestos detected. Amosite asbestos detected.**

9.8 Laboratory Results for Groundwater

A total of 28 groundwater samples (including 3 QA/QC replicates) from the 25 installed monitoring wells were analysed for the potential contaminants identified in Section 6. The samples were tested for the following analytes:

- pH;
- Electrical Conductivity;
- Anions: Fluoride (F), Ammonia (NH_3), NOx, Total Kjeldahl Nitrogen (TKN);
- Cations: Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na), Total Phosphorus (P)
- Metals: Aluminium (Al), Arsenic (As), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Iron (Fe), Manganese (Mn), Nickel (Ni), Lead (Pb), Tin (Sn), Zinc (Zn), Mercury (Hg);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine / Organophosphorus Pesticides;

- Polychlorinated Biphenyls (PCBs).

Five groundwater samples were additionally tested for Volatile Organic Compounds (VOCs), corresponding to potential migration of contaminants from potential off-site or on-site sources identified in Section 6.

The results of chemical analysis undertaken for groundwater samples are presented in the attached laboratory report sheets (Appendix B), and are summarised in Table 14 below.

Table 14: Laboratory Results for Groundwater

Sample Identification	1	2	3	4	5	KGP-D11	6	7	8	9	10-U	10-L	11	12	13	14-U	14-L	15-U	15-L	16	17	18	20-U	KGP-D10	20-L	21	KGP-D12	22	Laboratory PQL	Australian Drinking Water Guidelines - Health Based (mg/L)	ANZECC (2000) - Trigger Values	
																														Slightly to Moderately disturbed systems		Irrigation Waters
Date Sampled	22-Aug-11	23-Aug-11	23-Aug-11	23-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	23-Aug-11	23-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	17-Aug-11	16-Aug-11	16-Aug-11	17-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	17-Aug-11	17-Aug-11	17-Aug-11	23-Aug-11	23-Aug-11	23-Aug-11				Fresh	Marine	
PID Groundwater Headspace (ppm)	<1	5	14	<1	3	3	2	<1	15	<1	<1	<1	<1	<1	NT	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
pH	5.6	5.7	5.9	5.6	5.1	5.1	6	5.3	5.5	6.9	7	6.2	6.6	6.9	6.9	6.6	7.4	6.9	5.8	6.5	6.7	7	6.7	6.7	7.1	6.3	6.2	6.3	0.01	6.5-8.5 [13]	6.5-8.0 [1]	7.0-8.5 [2]	>6 [7]
Electrical Conductivity (uS/cm)	200	230	240	160	270	270	360	200	300	1100	11000	1400	530	2700	25000	17000	54000	1100	820	21000	19000	400	29000	26000	51000	23000	22000	18000	1	NC	NC	NC	1000 - 7500 [9]
Anions																																	
Fluoride (F)	<0.1	<0.1	0.57	0.66	0.28	0.28	2.2	2.7	1.4	0.32	0.78	0.13	<0.1	0.65	0.5	0.57	0.43	0.85	0.13	0.29	0.52	0.14	0.45	0.44	0.47	0.31	0.29	0.32	0.1	1.5	NC	NC	1 [6]
Ammonia (NH_3) as N	<0.005	0.089	0.19	0.031	0.3	0.3	0.6	0.098	0.31	0.15	0.74	1.4	0.21	0.46	0.82	1.5	20	0.027	0.23	0.53	0.024	0.19	1.4	1.2	8	0.77	0.84	3.2	0.005	0.41 [13] [8]	0.9	0.91	NC
Total Nitrogen as N	7.6	2.29	5.5	2.5	1.505	1.6	4.9	1.3	2.2	0.2	1.2	1.4	0.82	7.4	1.3	2.4	20	0.7	0.2	0.8	0.3	18.08	2.4	2.2	8.6	2.7	2.5	7.2	0.125/0.15	NC	0.35 [1]	0.12 [1]	5 [5]
NO_x (NO_2^- + NO_3^-)	5.3	0.09	<PQL	0.2	0.005	<PQL	0.3	<PQL	<PQL	<PQL	<PQL	<PQL	0.02	<PQL	0.1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.08	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.05/2.5	3 [9]	0.04 [1]	0.015 [2]	NC
TKN	2.3	2.2	5.5	2.3	1.5	1.6	4.6	1.3	2.2	0.2	1.2	1.4	0.8	7.4	1.2	2.4	20	0.7	0.2	0.8	0.3	18	2.4	2.2	8.6	2.7	2.5	7.2	0.1				
Cations																																	
Ca	8.9	6	7.5	5.8	7.5	8.1	31	2.7	5.5	150	560	52	74	100	670	590	400	110	18	550	360	46	590	570	470	530	530	380	0.5	NC	NC	NC	NC
Mg	4.1	1.9	5.6	2.1	7.5	8	5.8	2.5	4	18	260	23	5.7	64	740	440	1700	24	13	730	500	6.8	1100	1000	1600	820	810	500	0.5	NC	NC	NC	NC
K	4.4	3	5.3	1.4	2.5	2.7	8.4	3.4	6	1.5	46	6.9	4.3	85	140	100	340	6.8	6.3	150	140	1.7	200	190	360	120	120	100	0.5	NC	NC	NC	NC
Na	14	34	26	18	18	23	24	25	40	90	2200	200	26	300	5400	3100	13000	79	100	4500	4000	18	5700	5500	13000	4400	4300	3300	0.5	180 [12]	NC	NC	Species Dependent
Total Phosphorus	0.4	0.3	0.7	0.1	0.05	<PQL	1.3	0.08	0.1	0.3	0.2	0.1	0.2	3.8	0.2	0.4	2.4	0.2	0.07	0.4	0.2	2.7	0.4	0.4	0.6	0.2	0.2	1.1	0.05	NC	0.05 [1]	0.03 [2]	0.05 [6]
Metal																																	
Al	0.46	1.4	1.4	0.79	1	1.1	1.7	3.4	2.3	<PQL	0.01	0.049	0.01	0.021	0.03	0.03	0.02	0.015	0.05	0.03	0.028	0.018	0.023	0.021	0.026	0.03	0.032	0.021	0.01	0.02 [13]	0.0008 [17] [L] / 0.055 [18] [L]	0.0005 [19] [L]	NC
As	<PQL	<PQL	0.005	0.001	<PQL	<PQL	0.007	0.002	0.003	0.005	0.004	<PQL	0.001	0.005	0.002	0.004	0.002	0.003	0.001	<PQL	0.005	0.002	<PQL	<PQL	0.007	0.001	0.001	0.002	0.001	0.007	0.013 [14]	NC	0.1 [5]
Cd	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0002	<PQL	0.0002	<PQL	<PQL	0.0002	0.0001	0.0004	0.0001	0.0002	<PQL	<PQL	0.0002	0.0001	0.0001	0.002	0.0002	0.0007	0.01 [5]
Co	<PQL	<PQL	0.007	<PQL	0.001	0.001	0.009	0.002	0.002	<PQL	0.002	<PQL	<PQL	0.013	0.021	0.064	0.001	0.005	0.001	0.06	0.013	0.001	0.018	0.02	<PQL	0.25	0.25	0.1	0.001	NC	NC	0.001	0.05 [5]
Cr	0.003	0.003	0.003	0.002	0.003	0.003	0.004	0.004	0.004	<PQL	<PQL	0.002	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.05 [12]	0.001 [12]	0.0044 [12]	0.1 [5]
Cu	0.001	<PQL	0.001	0.001	0.001	<PQL	0.017	0.002	0.004	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	0.004	<PQL	<PQL	<PQL	<PQL	0.002	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	2	0.0014	0.0013	0.2 [5]
Fe	0.08	0.4	23	0.8	1.3	1.4	2.9	4.3	5.4	9.6	30	6.1	7.1	6.1	9.6	47	4.7	3.2	14	2.9	9.8	2.5	46	50	1.3	250	250	320	0.002	0.3 [13]	NC	NC	0.2 [5]
Mn	0.034	0.017	0.56	0.042	0.046	0.045	1.4	0.22	0.33	0.36	2.5	0.22	0.1	0.94	2.7	1.1	0.81	0.38	0.19	4.5	0.95	0.23	6.9	6.8	0.94	17	16	8.1	0.005	0.5	1.9	NC	0.2 [5]
Ni	0.007	0.011	0.015	0.006	0.02	0.02	0.032	0.008	0.01	0.003	0.004	0.004	0.006	0.021	0.031	0.069	0.006	0.027	0.031	0.094	0.036	0.001	0.029	0.03	0.023	0.16	0.16	0.074	0.001	0.02	0.011	0.007	0.2 [5]
Pb	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.01	0.0034	0.0044	2 [5]
Sn	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.002	0.002	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	0.001	NC	NC	NC	NC
Zn	0.02	0.01	0.011	0.013	0.03	0.029	1.1	0.09	0.032	0.006	0.009	0.014	0.005	0.032	0.019	<PQL	0.015	0.009	0.03	0.043	0.028	0.011	0.039	0.044	0.004	0.069	0.069	0.026	0.001	NC	0.008	0.015	2 [5]
Hg	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	0.001	0.00006 [15]	0.0001 [15]	0.002 [6]
TRH																																	
C_6 - C_9	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.01	NC	NC	NC	NC
C_{10} - C_{14}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.05	NC	NC	NC	NC
C_{15} - C_{28}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1	NC	NC	NC	NC
C_{29} - C_{36}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1	NC	NC	NC	NC
BTEX																																	
Benzene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.001	0.95	0.5	NC
Toluene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.8	NC	0.18 [L]	NC
Ethyl Benzene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.3	NC	0.08 [L]	NC
Xylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<0.003	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.004	0.003	0.003	<PQL	<PQL	<PQL	<PQL	0.003	0.6	0.2 [16]	NC	NC
PAHs																																	
Total PAHs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<0.0016	<0.0016	<PQL	<PQL	<PQL	<PQL	<0.0018	<0.0017	<0.0017	<0.0018	<PQL	<PQL	<0.0017	0.0001 each	NC	NC	NC	NC
Naphthalene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	0.0001	<PQL	<PQL	<PQL	<PQL	0.0003	0.0002	0.0002	0.0003	<PQL	<PQL	0.0002	0.0001	NC	0.016	0.05	NC
Acenaphthylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Acenaphthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Fluorene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Phenanthrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.0006 [L]	0.0006 [L]	NC
Anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.00001 [L]	0.00001 [L]	NC
Fluoranthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.001 [L]	0.001 [L]	NC
Pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*a*]anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Chrysene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*b,k*]fluoranthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0002	NC	NC	NC	NC
Benzo[*a*]pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	0.00001	0.0001 [L]	0.0001 [L]	NC
Indeno[*123-cd*]pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Dibenzo[*ah*]anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*ghi*]perylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Total OPPs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001 each	Species Dependent	Species Dependent	Species Dependent	NC
OCPs																																	
Total OCPs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.00001-0.00005ea	NC	NC	NC	NC
Aldrin + Dieldrin	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.002	0.0003	NC	NC	NC
Chlordane	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.001	0.00003	NC	NC
DDT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.02	0.000006	NC	NC
Heptachlor	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.0003	0.00001	NC	NC
Total PCBs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001 each	NC	NC	NC	NC

Table 14: Laboratory Results for Groundwater (Continued)

Sample Identification	1	2	3	4	5	KGP-D11	6	7	8	9	10-U	10-L	11	12	13	14-U	14-L	15-U	15-L	16	17	18	20-U	KGP-D10	20-L	21	KGP-D12	22	Laboratory PQL	Australian Drinking Water Guidelines - Health Based (mg/L)	ANZECC (2000) - Trigger Values		
																															Slightly to Moderately disturbed systems		Irrigation Waters
Date Sampled	22-Aug-11	23-Aug-11	23-Aug-11	23-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	23-Aug-11	23-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	22-Aug-11	17-Aug-11	16-Aug-11	16-Aug-11	17-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	17-Aug-11	17-Aug-11	17-Aug-11	17-Aug-11	23-Aug-11	23-Aug-11	23-Aug-11			Fresh	Marine	
PID Groundwater Headspace (ppm)	<1	5	14	<1	3	3	2	<1	15	<1	<1	<1	<1	<1	NT	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
VOCs																																		
Total VOCs	NT	<PQL	<0.112	<0.107	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01/0.001 each	NC	NC	NC	NC
Dichlorodifluoromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
Chloromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
Vinyl Chloride	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
Bromomethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
Chloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
Trichlorofluoromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.01	NC	NC	NC	NC
1,1-Dichloroethene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.03	NC	NC	NC
Trans-1,2-dichloroethene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.06	NC	NC	NC
1,1-dichloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Cis-1,2-dichloroethene	NT	<PQL	<PQL	0.001	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.06	NC	NC	NC
Bromochloromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Chloroform	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	0.37 [20]	0.37 [20]	NC
2,2-dichloropropane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2-dichloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.003	NC	NC	NC
1,1,1-trichloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,1-dichloropropene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Cyclohexane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Carbon tetrachloride	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Dibromomethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2-dichloropropane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Trichloroethene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Bromodichloromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
trans-1,3-dichloropropene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
cis-1,3-dichloropropene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,1,2-trichloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,3-dichloropropane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Dibromochloromethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2-dibromoethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Tetrachloroethene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.05	NC	NC	NC
1,1,1,2-tetrachloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Chlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Bromoform	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Styrene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,1,2,2-tetrachloroethane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2,3-trichloropropane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Isopropylbenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Bromobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
n-propyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
2-chlorotoluene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
4-chlorotoluene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,3,5-trimethyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
Tert-butyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2,4-trimethyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,3-dichlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.02 [13]	0.26	NC	NC
Sec-butyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,4-dichlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.003 [13]	0.06	NC	NC
4-isopropyl toluene	NT	<PQL	0.005	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2-dichlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.001 [13]	0.16	NC	NC
n-butyl benzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2-dibromo-3-chloropropane	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2,4-trichlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.005 [13]	0.085	0.02	NC
Hexachlorobutadiene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	NC	NC	NC	NC
1,2,3-trichlorobenzene	NT	<PQL	<PQL	<PQL	NT	NT	NT	<PQL	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	NT	NT	NT	NT	NT	NT	NT	NT	0.001	0.005 [13]	0.003	NC	NC

Notes

Results expressed in mg/L unless otherwise stated

PQL - Practical Quantitation Limits

(1) - Trigger Values for physical and chemical stressors for south-east Australia for Slightly Disturbed Ecosystems (Table 3.3.2)-Lowland Rivers

(2) - Trigger Values for physical and chemical stressors for south-east Australia for Slightly Disturbed Ecosystems (Table 3.3.2)-Estuaries

(3) - Tolerance value of Clover (Conservative Value for Pastures)

(4) - Low risk of increasing crop cadmium concentrations

(5) - Long Term Trigger Values (up to 100 yrs)

(6) - To minimse bioclogging of irrigation equipment

(7) - Trigger Values for assessing corrosiveness of water

(8) - Drinking water criteria re-calculated for Ammonia as N

(9) - Health based criteria for Nitrite (Conservative)

(12) - Chromium (VI)

(13) - Aesthetic Guideline Value

(14) - Arsenic (V) (conservative)

(15) - Mercury (Inorganic)

(16) - p-xylene (conservative)

(17) - Trigger Values for Fresh Water pH < 6.5

(18) - Trigger Values for Fresh Water pH > 6.5

(19) - Trigger Values for Marine Water pH < 6.5

(20) - Recommended for slightly to moderately disturbed systems to protect key species from chronic toxicity

(L) - 95% Low Reliability Trigger Values (99% protection level applied where recommended (i.e. benzo(a)pyrene))

(M) - 95% Moderate Reliability Trigger Value

KGP-D10 - Replicate of sample 20-U

KGP-D11 - Replicate of sample 5

KGP-D12 - Replicate of sample 21

NA - Not Applicable

NC - No Criteria

NT - Not Tested

Total N: TKN + NOx

-U' suffix denotes wells screened in upper clays

-L' suffix denotes wells screened in lower clays

Exceeds ANZECC 2000 Guidelines - Marine Waters

Exceeds ANZECC 2000 Guidelines - Fresh Waters

Bold results exceed Australian Drinking Water Guidelines - Health Based

9.9 Laboratory Results for Surface Waters

A total of 23 surface water samples (including 2 QA/QC replicates) were analysed for the potential contaminants (see Section 6):

- pH;
- Electrical Conductivity;
- Anions: Fluoride (F), Ammonia (NH_3), NOx, Total Kjeldahl Nitrogen (TKN);
- Cations: Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na), Total Phosphorus (P);
- Metals: Aluminium (Al), Arsenic (As), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Iron (Fe), Manganese (Mn), Nickel (Ni), Lead (Pb), Tin (Sn), Zinc (Zn), Mercury (Hg);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl Benzene, Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine / Organophosphorus Pesticides;
- Polychlorinated Biphenyls (PCBs).

Three surface water samples were additionally tested for Volatile Organic Compounds (VOCs), corresponding to potential migration of contaminants from off-site sources identified in Section 6.

The results of chemical analysis undertaken on surface water samples are presented in the attached laboratory report sheets (Appendix B), and are summarised in Table 15 below.

Table 15: Laboratory Results for Surface Waters

Sample Identification	SW121	SW122	SW123	SW124	SW125	SW126	SW127	SW128	SW129	SW130	KGP D9	SW131	SW132	SW133	SW134	SW135	SW136	SW137	SW138	SW139	KGP D8	SW140	SW141	Laboratory PQL	Australian Drinking Water Guidelines - Health Based (mg/L)	ANZECC (2000) - Trigger Values		
																										Slightly to Moderately disturbed systems		Irrigation Waters
Date Sampled	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	15-Aug-11	15-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11				Fresh	Marine	
PID (ppm)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
pH	7.8	6.9	7.9	6.8	7.9	6.8	**5.7**	6.6	**5.8**	6.7	6.8	**6.2**	6.9	6.6	6.5	6.5	7	**6.3**	**6**	**6.3**	**6.2**	**5.2**	**6**	0.01	6.5-8.5 [13]	6.5-8.0 [1]	7.0-8.5 [2]	>6 [7]
Electrical Conductivity (uS/cm)	15000	3100	15000	1200	19000	410	4000	11000	4400	1700	1700	1200	7800	1600	550	620	400	200	190	190	190	190	110	1	NC	NC	NC	1000 - 7500 [3]
Anions																												
Fluoride (F)	0.45	1	0.46	1	0.5	0.93	1.1	0.71	1.1	1.1	1.1	0.9	0.41	0.67	0.68	0.88	1.3	0.44	0.42	1.1	1.1	1.5	1.1	0.1	1.5	NC	NC	1 [5]
Ammonia (NH_3) as N	0.016	<PQL	0.01	<PQL	0.031	<PQL	<PQL	<PQL	0.054	0.0083	0.0067	0.016	0.01	<PQL	<PQL	0.052	0.029	0.006	<PQL	0.0096	0.015	<PQL	<PQL	0.005	0.41 [13] [8]	0.9	0.91	NC
Total Nitrogen as N	0.95	1.6	0.55	1.2	0.58	1.2	0.8	1.5	5.2	1.7	1.8	3.4	0.9	1.6	2.4	3.1	3.9	2.31	8.8	1.84	1.82	1.9	1.2	0.125/0.105	NC	0.35 [1]	0.12 [1]	5 [5]
NO_x (NO_2^- + NO_3^-)	0.05	<PQL	0.05	<PQL	0.08	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.01	<PQL	0.04	0.02	<PQL	<PQL	0.05/2.5	3 [9]	0.04 [1]	0.015 [2]	NC
TKN	0.9	1.6	0.5	1.2	0.5	1.2	0.8	1.5	5.2	1.7	1.8	3.4	0.9	1.6	2.4	3.1	3.9	2.3	8.8	1.8	1.8	1.9	1.2	0.1				
Cations																												
Ca	130	56	130	36	160	19	53	470	55	50	37	15	69	23	12	19	32	7	4.8	9.6	9.6	4.2	4.1	0.5	NC	NC	NC	NC
Mg	360	64	340	27	450	8.7	72	230	93	29	22	22	170	33	6.5	7.6	4.8	1.9	1.6	3.4	3.6	2.6	2	0.5	NC	NC	NC	NC
K	110	19	98	8.1	140	3.3	24	59	27	10	7.9	9.6	52	12	3.2	4.3	1.7	1	0.9	4.3	4.4	2.6	2.4	0.5	NC	NC	NC	NC
Na	3200	470	3000	170	4200	45	410	1700	610	170	130	130	1500	250	39	37	20	9.8	11	16	22	25	9.5	0.5	180 [13]	NC	NC	Species Dependent
Metal																												
Al	**1**	**0.23**	**0.5**	**0.24**	**1.6**	**0.55**	**0.22**	**0.18**	**0.46**	**0.094**	**0.32**	**1.6**	**0.2**	**0.18**	**0.078**	**0.48**	**0.97**	**1.2**	**2.5**	**1.1**	**1.2**	**1.7**	**0.47**	0.01	0.02 [13]	0.0008 [17] [L] / 0.055 [18] [L]	0.0005 [19] [L]	NC
As	0.001	0.001	<PQL	<PQL	0.001	<PQL	0.001	0.001	0.002	0.001	0.004	0.002	<PQL	<PQL	0.001	0.002	0.003	**0.016**	**0.024**	**0.017**	**0.018**	0.002	<PQL	0.001	0.007	0.013 [14]	NC	0.1 [5]
Cd	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	<PQL	<PQL	0.0001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0002	<PQL	<PQL	<PQL	<PQL	0.0001	0.002	0.0002	0.0007	0.01 [5]
Co	<PQL	<PQL	<PQL	0.002	0.001	0.001	0.007	0.02	0.025	0.002	0.009	0.019	0.002	0.004	0.004	0.01	0.008	0.001	0.009	<PQL	<PQL	0.001	0.001	0.001	NC	NC	0.001	0.05 [5]
Cr	0.002	0.002	0.001	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.009	0.004	0.001	0.001	0.001	0.003	0.004	0.005	0.005	0.003	0.003	0.004	<PQL	0.001	0.05 [12]	0.001 [12]	0.0044 [12]	0.1 [5]
Cu	0.002	0.002	0.001	0.001	0.002	0.001	<PQL	<PQL	0.001	0.001	0.006	0.006	<PQL	0.002	<PQL	0.002	0.003	0.005	0.013	0.002	0.002	0.004	0.004	0.001	2	0.0014	0.0013	0.2 [5]
Fe	**1.5**	**0.9**	**0.6**	**2.3**	**2.2**	**3.9**	**1.9**	**9.2**	**4.5**	**1.9**	**1.4**	**13**	**3.7**	**3.1**	**6**	**8.4**	**12**	**14**	**9.6**	**8**	**9**	**4.1**	**1**	0.002	0.3 [13]	NC	NC	0.2 [5]
Mn	0.066	0.031	0.038	0.094	0.075	0.089	0.2	**1.2**	**1.3**	0.035	0.18	0.32	0.11	0.086	0.18	0.29	**0.59**	0.1	**0.59**	0.18	0.25	0.15	0.18	0.005	0.5	1.9	NC	0.2 [5]
Ni	0.002	0.005	0.002	0.009	0.003	0.006	0.019	0.013	**0.023**	0.016	**0.075**	**0.037**	0.005	0.018	0.007	0.013	0.011	0.002	0.012	0.004	0.003	0.008	0.004	0.001	0.02	0.011	0.007	0.2 [5]
Pb	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	0.003	**0.024**	**0.027**	0.004	0.004	0.004	0.004	0.001	0.01	0.0034	0.0044	2 [5]
Sn	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.003	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	NC	NC	NC	NC
Zn	0.004	0.005	0.001	0.012	0.01	0.011	0.033	0.01	0.018	0.007	0.032	0.023	0.004	0.011	0.007	0.008	0.026	0.024	0.13	0.01	0.011	0.036	0.043	0.001	NC	0.008	0.015	2 [5]
Hg	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	0.001	0.00006 [15]	0.0001 [15]	0.002 [6]
TRH																												
C_6 - C_9	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.01	NC	NC	NC	NC
C_{10} - C_{14}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.05	NC	NC	NC	NC
C_{15} - C_{28}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1	NC	NC	NC	NC
C_{29} - C_{36}	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1	NC	NC	NC	NC
BTEX																												
Benzene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.001	0.95	0.5	NC
Toluene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.8	NC	0.18 [L]	NC
Ethyl Benzene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.3	NC	0.08 [L]	NC
Xylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.003	0.6	0.2 [16]	NC	NC
PAHs																												
Total PAHs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001 each	NC	NC	NC	NC
Naphthalene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.016	0.05	NC
Acenaphthylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Acenaphthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Fluorene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Phenanthrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.0006 [L]	0.0006 [L]	NC
Anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.00001 [L]	0.00001 [L]	NC
Fluoranthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	0.001 [L]	0.001 [L]	NC
Pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*a*]anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Chrysene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*b,k*]fluoranthene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0002	NC	NC	NC	NC
Benzo[*a*]pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	0.00001	0.0001 [L]	0.0001 [L]	NC
Indeno[*123-cd*]pyrene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Dibenzo[*ah*]anthracene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Benzo[*ghi*]perylene	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001	NC	NC	NC	NC
Total OPPs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001 each	Species Dependent	Species Dependent	Species Dependent	NC
OCPs																												
Total OCPs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.0001/0.00005 ea	NC	NC	NC	NC
Aldrin + Dieldrin	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.002	0.0003	NC	NC	NC
Chlordane	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.001	0.00003	NC	NC
DDT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.02	0.000006	NC	NC
Heptachlor	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001	0.0003	0.00001	NC	NC
Total PCBs	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.001 each	NC	NC	NC	NC
Phosphorus																												
Total Phosphorus	0.1	0.1	0.08	0.2	0.1	0.2	0.1	0.4	0.5	0.2	0.1	1.1	0.1	0.08	0.4	0.8	0.7	0.09	1.3	0.3	0.3	<PQL	<PQL	0.05	NC	0.05 [1]	0.03 [2]	0.05 [6]

Table 15: Laboratory Results for Surface Waters (Continued)

Sample Identification	SW121	SW122	SW123	SW124	SW125	SW126	SW127	SW128	SW129	SW130	KGP D9	SW131	SW132	SW133	SW134	SW135	SW136	SW137	SW138	SW139	KGP D8	SW140	SW141	Laboratory PQL	Australian Drinking Water Guidelines - Health Based (mg/L)	ANZECC (2000) - Trigger Values		
																										Slightly to Moderately disturbed systems		
																										Fresh	Marine	Irrigation Waters
Date Sampled	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	15-Aug-11	15-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	16-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11	15-Aug-11						
PID (ppm)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1						
VOCs																													
Total VOCs	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.109	<0.111	NT	NT	<PQL	NT	0.01/0.001 each	NC	NC	NC	NC
Dichlorodifluoromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
Chloromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
Vinyl Chloride	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
Bromomethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
Chloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
Trichlorofluoromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.01	NC	NC	NC	NC
1,1-Dichloroethene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.03	NC	NC	NC
Trans-1,2-dichloroethene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.06	NC	NC	NC
1,1-dichloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Cis-1,2-dichloroethene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.06	NC	NC	NC
Bromochloromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Chloroform	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.002	<PQL	NT	NT	<PQL	NT	0.001	NC	0.37 (20)	0.37 (20)	NC
2,2-dichloropropane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2-dichloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.003	NC	NC	NC
1,1,1-trichloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,1-dichloropropene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Cyclohexane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Carbon tetrachloride	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Dibromomethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2-dichloropropane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Trichloroethene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	0.004	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Bromodichloromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
trans-1,3-dichloropropene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
cis-1,3-dichloropropene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,1,2-trichloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,3-dichloropropane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Dibromochloromethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2-dibromoethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Tetrachloroethene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.05	NC	NC	NC
1,1,1,2-tetrachloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Chlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Bromoform	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Styrene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,1,2,2-tetrachloroethane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2,3-trichloropropane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Isopropylbenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Bromobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
n-propyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
2-chlorotoluene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
4-chlorotoluene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,3,5-trimethyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
Tert-butyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2,4-trimethyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,3-dichlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.02 (13)	0.26	NC	NC
Sec-butyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,4-dichlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.003 (13)	0.06	NC	NC
4-isopropyl toluene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2-dichlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.001 (13)	0.16	NC	NC
n-butyl benzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2-dibromo-3-chloropropane	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2,4-trichlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.005 (13)	0.085	0.02	NC
Hexachlorobutadiene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	NC	NC	NC	NC
1,2,3-trichlorobenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<PQL	<PQL	NT	NT	<PQL	NT	0.001	0.005 (13)	0.003	NC	NC

Notes

Results expressed in mg/L unless otherwise stated
PQL - Practical Quantitation Limits
(1) - Trigger Values for physical and chemical stressors for south-east Australia for Slightly Disturbed Ecosystems (Table 3.3.2)-Lowland Rivers
(2) - Trigger Values for physical and chemical stressors for south-east Australia for Slightly Disturbed Ecosystems (Table 3.3.2)-Estuaries
(3) - Tolerance value of Clover (Conservative Value for Pastures)
(4) - Low risk of increasing crop cadmium concentrations
(5) - Long Term Trigger Values (up to 100 yrs)
(6) - To minimse bioclogging of irrigation equipment
(7) - Trigger Values for assessing corrosiveness of water
(8) - Drinking water criteria re-calculated for Ammonia as N
(9) - Health based criteria for Nitrite (Conservative)
(12) - Chromium (VI)
(13) - Aesthetic Guideline Value
(14) - Arsenic (V) (conservative)
(15) - Mercury (Inorganic)
(16) - p-xylene (conservative)
(17) - Trigger Values for Fresh Water pH < 6.5
(18) - Trigger Values for Fresh Water pH > 6.5
(19) - Trigger Values for Marine Water pH < 6.5
(20) - Recommended for slightly to moderately disturbed systems to protect key species from chronic toxicity
(L) - 95% Low Reliability Trigger Values (99% protection level applied where recommended (ie benzo(a)pyrene))
(M) - 95% Moderate Reliability Trigger Value
Total N: TKN + NOx
NT - Not Tested
NC - No Criteria
KGP D8 - Duplicate of Sample SW139
KGP D9 - Duplicate of Sample SW130
Exceeds ANZECC 2000 Guidelines - Marine Waters
Exceeds ANZECC 2000 Guidelines - Fresh Waters
Bold results exceed Australian Drinking Water Guidelines - Health Based

9.10 Assessment of Data Reliability

Full details of the QA/QC programme and results are presented in Appendix D. The following is a summary of the data reliability assessment.

Table 16: Assessment of Data Reliability based on Data Quality Indicators

DQI	Attributes	Target	Achieved
Completeness	Critical Samples collected - location and depth Experienced field staff Documentation correct Critical samples analysed Chemical analysis per sampling plan Complied with holding times	95%	100%
Comparability	Consistent sampling procedures Climatic / physical site conditions Experienced field staff Same laboratories used	Qualitative	High
Representativeness	Appropriate media sampled All samples collected for identified contaminants of concern All samples analysed per sampling plan	Qualitative	High
Precision (variability or reproducibility)	Analysis of field and laboratory replicates and achievement of acceptable RPDs, acceptable levels for laboratory QC criteria.	RPD 0 - 50%[1] RPD 0 -35%[2]	0% - 108%[1] 0% - 74%[2]
Accuracy (bias)	Analysis of field blanks, rinsate blanks, matrix spikes, surrogate spikes, etc.	60 - 140% 70 - 130%	52% - 136% 75% - 109%

Notes to Table 16:

1. Organics: one result for organics (BaP) was outside the target RPD range, due to heterogeneity in fill materials
2. Inorganics: 96% of RPDs for inorganics were within the target range; the higher results relate to heterogeneity in fill materials

The field and laboratory data is assessed to be reliable and suitable for forming an opinion on the environmental condition of the site with regard to contamination.

10. Assessment of Site Contamination

10.1 Guidelines and Assessment Criteria

Results of the chemical analyses were compared to the following OEH (formerly NSW DECCW) recommended guidelines:

- NSW DEC (2006) Contaminated Sites - Guidelines for the Site Auditor Scheme 2nd Edition, April 2006 (Ref 18);
- NSW EPA (1994) Contaminated Sites - Guidelines for Assessing Service Station Sites, December 1994 (Ref 22);
- NSW DECCW (2009), *Waste Classification Guidelines – Part 1: Classifying Waste*, December 2009 (Ref 23);
- ANZECC (2000), "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", October 2000 (Ref 3).

The NSW DEC Guidelines for the NSW Site Auditor Scheme contain National Environmental Health Forum (NEHF) levels for various beneficial use scenarios including: low density residential (A), high density residential (D), recreational (E) and commercial / industrial (F). These criteria are applicable where aesthetic and ecological concerns are not an issue. Health based criteria for commercial / industrial land use (NEHF F), are considered to be appropriate for the proposed landuse and development.

The NSW EPA Guidelines for Assessing Service Station Sites (Ref 22) were used to assess total TRH and BTEX contamination within soils across the site. The criteria used are threshold concentrations for sensitive land use.

The NSW DECCW Guidelines for Waste Classification (Ref 23) were used to assess soil conditions for possible off-site disposal to a licensed landfill.

The ANZECC (2000) Guidelines for Fresh and Marine Water Quality (Ref 3) were used to assess surface water and groundwater quality. The protection of slightly to moderately disturbed aquatic ecosystem guidelines (marine / estuaries) are considered to be relevant to the site assessment due to the proximity of the site to the Hunter River and adjacent SEPP 14 wetlands (i.e. receiving waters). The receiving waters are considered to be a 'slightly to moderately disturbed system'. Where available, guidelines for 'fresh' waters were considered in the absence of criteria for 'marine' waters.

As per the NSW DEC Guidelines for the Assessment and Management of Groundwater Contamination (Ref 19), the NWQMS Australian Drinking Water Guidelines (Ref 16) were also used to assess surface water and groundwater quality. It is noted, however, that there are no registered groundwater wells down-gradient of the site and the groundwater is unlikely to be used for drinking water purposes.

10.2 Assessment of Soil Contamination

Soil chemical analysis results were generally within the health based criteria for commercial / industrial land use (i.e. NEHF F) and NSW EPA sensitive land use criteria for TRH and BTEX, with the exception of elevated TRH (C_{15}-C_{36}) and PAHs in samples Pit 54/0.1 m and Pit 79/0.05 m. Drawing 4 in Appendix D shows the location of these exceedances.

Sample Pit 54/0.1 m comprised a mixture of sand and asphalt within a former driveway, while sample Pit 79/0.5 m comprised dark grey silty clay filling with some ash and orange gravel within the former WWII access track.

It is noted that trace concentration of Dieldrin (OCP) and Chlorpyriphos (OPP) were detected in two soil samples, however, the concentrations were very low and well below available landuse criteria.

No detectable concentrations of volatile hydrocarbons were detected within the samples tested.

Concentrations of Fluoride within near surface soils across the site indicate concentrations were generally higher in the north western corner of the site (i.e. closest point on site to Tomago Aluminium) suggesting some impact of surface soils from Fluoride fallout has occurred.

Nutrient concentrations (i.e. NOx, TKN, Ammonia and Total Phosphorus) concentrations measured within near surface soils in the vicinity of former effluent disposal systems (i.e. septic pits) and WWII facilities compared to background concentrations in Samples from Pit 1 and Pit 5, indicate the following:

- Nitrogen concentrations measured at potential contaminant sources were generally similar to background concentrations, with the exception of sample Pit 83/0.05 m which detected a TKN concentration approximately 3 times the background concentration;
- Ammonia concentrations measured at potential contaminant sources were generally similar to background concentrations, with the exception of samples Bore 21/0.05 m (former practice bombing range), Pit 52/0.25 m (septic tank), Pit 83/0.05 m (old mill) and Pit 91/0.05 m (former ammunition bunker) which comprised concentration 2 to 5 times background concentrations;
- Phosphorus concentrations measured at potential contaminant sources were generally higher than background concentrations, with notable elevated concentrations up to 17 times higher than background concentrations detected in samples Pit 31/0.5 m (septic tank), Pit 41/0.25 m (former dairy shed), Pit 52/0.25 m (septic tank) and Pit 83/0.05 m (old mill).

The results of analysis also indicated the presence of Chrysotile and Amosite asbestos within 11 of the 12 fibro sheeting fragment analysed, however, only one of the 25 soil samples tested detected asbestos (Sample F11 – Chrysotile asbestos detected). Asbestos materials were generally observed at the location of former structures on-site. Drawing 4 shows the location of asbestos detections. The possible presence of further materials containing asbestos within fill across the site cannot, however, be discounted.

10.3 Assessment of Groundwater Contamination

Laboratory analysis results of groundwater samples indicated some exceedances of the ANZECC (2000) Trigger Values for Slightly to Moderately Disturbed Ecosystems.

The locations where groundwater samples recorded exceedances of the ANZECC Trigger Values are shown on Drawing 5 in Appendix D. The analytes with concentrations exceeding the adopted Trigger Values are summarised in Table 17 below.

Table 17: Exceedances of the Adopted ANZECC (2000) Guideline Values - Groundwater

Analyte	Well Locations Exceeding the Adopted Trigger Level
pH	1 to 9, 10-L, 11 to 13, 14-U, 15-U, 15-L, 16, 17, 20-U, 21, 22
Ammonia	10-L, 14-U, 14-L, 20-U, 20-L, 22
Total Phosphorus	All wells
Aluminium	1 to 8, 10-L, 15-L, 21, 22
Cobalt	3, 6 to 8, 10-U, 12 to 13, 14-U, 15-U, 16, 17, 20-U, 21, 22
Copper	6, 7, 8, 14-L, 18
Manganese	10-U, 13, 16, 20-U, 21, 22
Nickel	2, 3, 5 to 8, 12, 13, 14-U, 15-U, 15-L, 16, 17, 20-U, 20-L, 21, 22
Zinc	1, 5 to 8, 12, 13, 15-L, 16, 17, 20-U, 21, 22

It is noted that the ANZECC (2000) guidelines trigger value range of pH 7.0 to pH 8.5 for estuarine environments is considered more appropriate than the marine or fresh water criteria given the close proximity of the site to the Hunter River.

It is noted that the ANZECC trigger values are not published for EC, Magnesium and certain PAH compounds (refer Table 14 and Table 15).

The majority of metal exceedances were for wells located in the north-western parts of the site adjacent to the Tomago Road site boundary. Most notably, the highest concentrations of metals, in particular Aluminium, were at Wells 6, 7 and 8 which are located down-gradient of Tomago Road industrial development

Elevated concentrations of Fluoride were detected in groundwater for all but three samples, with the highest concentrations recorded for Wells 6 to 8. However, it is noted that there is no ANZECC criteria for Fluoride.

The results of groundwater testing suggest that impact to groundwater quality has largely resulted from groundwater migration from off-site sources (i.e. Tomago Road industrial developments). Some metal concentrations, however, are slightly higher within the site compared to up-gradient wells. These metals are Cobalt, Manganese and Nickel.

10.4 Assessment of Surface Water Contamination

Laboratory analysis results of surface water samples indicated some exceedances of the ANZECC (2000) Trigger Values for Slightly to Moderately Disturbed Ecosystems.

The locations where surface water samples recorded exceedances of the ANZECC Trigger Values are shown on Drawing 6 in Appendix D. The analytes with concentrations exceeding the adopted Trigger Values are summarised in Table 18 below.

Table 18: Exceedances of the Adopted ANZECC (2000) Guideline Values - Surface Water

Analyte	Well Locations Exceeding the Adopted Trigger Level
pH	SW122, SW124, SW126 to SW135, SW137 to SW141
Total Phosphorus	SW121 to SW139
Total Nitrogen	All wells
NOx	SW121, SW123, SW125, 139
Aluminium	SW127, SW129, SW131, SW137 to SW141
Arsenic	SW137 to SW139
Cobalt	SW124, SW127 to 136, SW138
Chromium	SW130, SW137, SW138
Copper	SW121, SW122, SW125, SW130, SW131, SW133, SW135 to SW141
Nickel	SW124, SW127 to SW131, SW133, SW135, SW136, SW138, SW140
Lead	SW137, SW138
Zinc	SW127, SW129, SW130, SW131, SW136 to SW138, SW140, SW141

It is noted that the ANZECC (2000) guidelines trigger value range of pH 7.0 to pH 8.5 for estuarine environments is considered more appropriate than the marine or fresh water criteria given the close proximity of the site to the Hunter River.

It is noted that the ANZECC trigger values are not published for EC, Magnesium and certain PAH compounds (refer Table 6 and Table 7). TRH, BTEX and PAH, PCB and OC/OP Pesticides were not detected at concentrations above the laboratory detection limits.

Nutrient testing indicates elevated concentrations for all surface water samples. It is noted that the highest concentration of Total Nitrogen was identified in Sample SW138 located within a drain adjacent to the northern site boundary, which received runoff from the up-gradient industrial development.

Elevated concentrations of Fluoride were detected for all surface water samples, with the highest concentrations recorded for surface waters in the north-western parts of the site. The highest concentration was recorded for SW140, which is located directly adjacent to Tomago Road. It is noted that there is no ANZECC criteria for Fluoride.

The results of surface water testing suggest that some impact to surface water quality has resulted from groundwater migration from off-site sources (i.e. Tomago Road industrial developments), and is influenced by surface water drains present within the site. It is noted that with the exception of elevated Total Nitrogen, NO_X, Total Phosphorus and Copper concentrations, surface water samples collected from the Hunter River were within the ANZECC (2000) Trigger Values. Comparison of upstream and downstream samples from the Hunter River adjacent to the site indicate similar results, implying that the subject site is causing little or no off-site impact.

11. Conclusions

The results of sol contamination testing were generally below the adopted relevant landuse criteria, with the exception of localised occurrences of asbestos, petroleum hydrocarbons and polycyclic aromatic hydrocarbons.

The results of groundwater testing provided a snapshot of background water quality. The results indicated prevalent exceedances of the adopted ANZECC trigger values for pH, total phosphorus, ammonia, total nitrogen, NO_X and metals. Elevated fluoride levels were also recorded but there are no ANZECC criteria for fluoride. The results for other compounds were generally within the adopted ANZECC trigger values, where criteria are given.

The results of surface water testing indicated prevalent exceedances of the adopted ANZECC trigger values for pH, total phosphorus, total nitrogen, NO_X and metals. Elevated fluoride levels were also recorded but there are no ANZECC criteria for fluoride. The results for other compounds were generally within the adopted ANZECC trigger values, where criteria are given.

Some impact to groundwater and surface water is indicated, considered to be mainly due to off-site industrial activities along Tomago Road. Comparison of upstream and downstream samples from the Hunter River adjacent to the site indicate little or no off-site impact.

Localised remediation of soils will be required to address the localised presence of hydrocarbon and asbestos contamination. This should include the removal of remnant effluent disposal systems and remnant building structures (i.e. tanks, slabs and footings). These activities can be readily undertaken in conjunction with construction activities, and a Remediation Action Plan (RAP) should be prepared to set out remediation procedures and clean-up criteria.

The site contains potential acid sulphate soils, which could potentially be disturbed by the construction of drains, ponds and services or by dewatering. An Acid Sulphate Soil Management Plan (ASSMP) will be prepared for the site during the detailed design process for each stage.

It is concluded that the site is suitable for the proposed industrial development, subject to localised remediation (to be detailed in an RAP), and suitable management of surface water and groundwater.

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13. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for a project at Lot 1001 DP 1127780, 365 Tomago Road, Tomago, New South Wales in accordance with DP's proposal NCL110238 Rev 2, dated 17 June 2011. The report is provided for the exclusive use of ADW Johnson Pty Ltd and Northbank Enterprise Hub for this project only and for the purpose(s) described in the report. It should not be used for other projects or by a third party. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

The results provided in the report are indicative of the sub-surface conditions only at the specific sampling or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of anthropogenic influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be limited by undetected variations in ground conditions between sampling locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

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Appendix A

About this Report
Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Test Pit / Borehole Logs (Pits / Bores 1 to 120)

About this Report

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Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

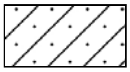
Soils


Topsoil

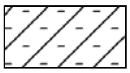

Peat


Clay

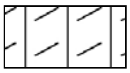

Silty clay

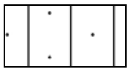

Sandy clay

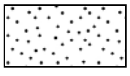

Gravelly clay

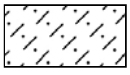

Shaly clay

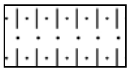

Silt


Clayey silt


Sandy silt

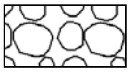

Sand

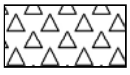

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

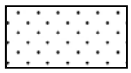

Talus

Sedimentary Rocks

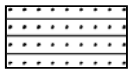

Boulder conglomerate

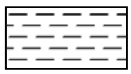

Conglomerate


Conglomeratic sandstone

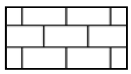

Sandstone


Siltstone


Laminite

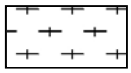

Mudstone, claystone, shale

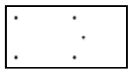

Coal


Limestone

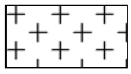
Metamorphic Rocks

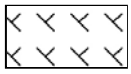

Slate, phyllite, schist

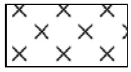

Gneiss

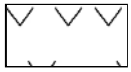

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.56 AHD
EASTING: 382147.3
NORTHING: 6367357.7
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									0.94m Stickup
	0.15	SAND: Grey/brown, fine to coarse grained sand, trace rootlets, damp		A,PID	0.05		<1ppm		From 0 to 0.3m, bentonite plug
		SAND: Grey, fine to coarse grained sand, damp		A,PID	0.25		<1ppm		
	0.4	SAND: Grey/brown, fine to coarse grained sand, damp		A,PID	0.5		<1ppm		From 0 to 0.5m, 50mm diameter class 18 PVC casing
	0.8	SAND: Dark grey/brown, fine to coarse grained sand, some to trace silt, damp		A,PID	1.0		<1ppm		
					1.5			▼	
	1.6	SAND: Brown, fine to coarse grained sand, saturated		S,PID			2,1,3 N = 4		From 0.3m to 3.4m, 5/2mm graded, washed gravel filter
					1.95				From 0.5m to 3.4m, 50mm diameter Class 18 machine slotted PVC screen
					3.0				
				S,PID			3,4,6 N = 10		
					3.45				At 3.4m, end cap
	3.5	Bore discontinued at 3.5m, limit of investigation		A,PID	3.5				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 1.4m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.02 AHD
EASTING: 381888.9
NORTHING: 6367219.8
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	Bricks		A,PID	0.1		<1ppm		0.97m Stickup From 0 to 0.1m, bentonite plug From 0 to 0.2m, 50mm diameter class 18 PVC casing
	0.2	SAND: Brown, medium to coarse grained sand, some rootlets, damp		A,PID	0.25		<1ppm		
		SAND: Grey, medium to coarse grained sand, moist		A,PID	0.5		<1ppm		
	0.75	SAND: Brown, fine to coarse grained sand, saturated						▼	
2	1			A,PID	1.0		<1ppm		1
					1.5				
				S,PID			6,8,12 N = 20 <1ppm		From 0.2m to 3.1m, 5/2mm graded, washed gravel filter From 0.2m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
1	2				1.95				2
0	3	At 3.0m, slight hydrocarbon odour			3.0				3 At 3.1m, end cap
				S,PID			3,10,13 N = 23 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
-1	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.75m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.50 AHD
EASTING: 381886.5
NORTHING: 6367020.2
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 49608.01
DATE: 29/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	FILLING: Generally comprising dark grey clay filling with some sand, trace coarse gravel, abundant rootlets to 0.15m, M>Wp		D,PID	0.1		<1ppm		0.91m Stickup From -0.1 to 0.05m, bentonite plug Fom 0 to 0.1m, 50mm diameter Class 18 PVC casing
				A,PID	0.25		<1ppm	▼	
	0.4	FILLING: Generally comprising light grey/black, fine to medium grained sand, wet to saturated							
		SAND: Very loose, light grey, fine to medium grained sand, saturated		A,PID	0.5		<1ppm		
	1			A,PID	1.0		2ppm		1
					1.5				
				S,PID			3,3,2 N = 5 <1ppm		From 0.05m to 3.1m, 5/2mm washed gravel filter From 0.1m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	2				1.95				2
	3				3.0				3 At 3.1m, end cap
				S			1,0,0 N = 0		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.35m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 4.10 AHD
EASTING: 381608.5
NORTHING: 6367124.9
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 49608.01
DATE: 29/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.29m Stickup
	0.2	FILLING: Generally comprising dark brown silty sand filling, some rootlets, abundant organic matter, damp		A,PID	0.05		<1ppm		From 0 to 0.2m, bentonite plug
	0.4	FILLING: Generally comprising dark grey silty sand filling, some organic matter, trace shell, damp		A,PID	0.25		<1ppm		From 0 to 0.3m, 50mm diameter Class 18 PVC casing
		SAND: Grey, fine to medium grained sand, damp		A,PID	0.5		<1ppm	▼	
	1			A,PID	1.0		<1ppm		1
	1.4	SAND: Dark grey/black, fine to medium grained sand, trace silt, moist			1.5				
		From 1.5m, saturated, grading to dark brown/grey		S,PID			7,12,10 N = 22 <1ppm		From 0.2m to 3.2m, 5/2mm graded, washed gravel filter
	2				1.95				From 0.3m to 3.2m, 50mm diameter Class 18 machine slotted PVC screen 2
	3				3.0				3
				S,PID			16,19,25 N = 44 <1ppm		At 3.2m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.4m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.13 AHD
EASTING: 381360.5
NORTHING: 6366920.5
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 49608.01
DATE: 27/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	FILLING (Topsoil?): Generally comprising dark grey, fine to medium grained sand filling, trace silt and clay, abundant rootlets, moist		D,PID	0.1		<1ppm		1.03m Stickup From -0.1m to 0.05m, bentonite plug From 0 to 0.1m, 50mm diameter Class 18 PVC casing
				A,PID	0.25		<1ppm		
	0.3	SAND: Light grey, fine to medium grained sand, wet to saturated							
				A,PID	0.5		<1ppm	▼	
	0.7	SAND: Dense to very dense, grey/brown, fine to medium grained sand, trace clay, saturated							
	1			A,PID	1.0		<1ppm		1
					1.5				
	1.6	SAND: Dense to very dense, brown, fine to medium grained sand, wet to saturated		S,PID			17,29,23 N = 52 <1ppm		From 0.05m to 3.1m, 5/2mm graded washed gravel filter From 0.1m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	2				1.95				2
	3				3.0				3 At 3.1m, end cap
	3.1	SAND: Medium dense, brown, light grey, fine to medium grained sand, saturated		S,PID			6,10,15 N = 25 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.55m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.21 AHD
EASTING: 381391.2
NORTHING: 6366702.9
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 49608.01
DATE: 26/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									0.82m Stickup
		FILLING: Grey, fine to medium grained sand filling with trace clay, gravel and abundant rootlets to 0.15m/0.2m, moist		D,PID	0.1		<1ppm		From 0 to 0.1m, 50mm diameter Class 18 PVC casing
	0.3	At 0.2m, increased clay content		D,PID	0.25		<1ppm		From 0 to 0.3m, bentonite plug
		SAND (Filling?): Grey, fine to medium grained sand (filling?) with trace clay and gravel, saturated		A,PID	0.5		<1ppm	▼	
	0.6	SAND: Very loose, grey, fine to medium grained sand, saturated							
	1			A,PID	1.0		<1ppm		1
					1.5				
				S,PID			3,2,2 N = 4 <1ppm		From 0.2m to 3.3m, 5/2mm graded washed gravel filter
	2				1.95				2 From 0.1m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	3				3.2				3
				S,PID			1,1,1 N = 2 <1ppm		At 3.3m, end cap
	3.65	Bore discontinued at 3.65m, limit of investigation			3.65				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater encountered from approximately 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.19 AHD
EASTING: 381154.3
NORTHING: 6366719
DIP/AZIMUTH: 90°/--

BORE No: 7
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SAND: Dark grey/brown, fine to coarse grained sand, trace silt and rootlets, moist		A,PID	0.05		<1ppm		1.08m Stickup From 0 to 0.05m, bentonite plug From 0.0 to 0.1m, 50mm diameter Class 18 PVC casing
				A,PID	0.25		<1ppm		
		From 0.4m, brown, saturated		A,PID	0.5		<1ppm	▼	
	1			A,PID	1.0		<1ppm		1
		From 1.5m, loose			1.5				From 0.05m to 3.0m, 5/2mm graded washed gravel filter From 0.1m to 3.0m, 50mm diameter Class 18 machine slotted PVC screen
				S,PID			3,3,3 N = 6 <1ppm		
	2				1.95				2
	3	From 3.0m, very loose			3.0				3 At 3m, end cap
				S,PID			2,1,1 N = 2 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.4m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.16 AHD
EASTING: 380850.8
NORTHING: 6366614
DIP/AZIMUTH: 90°/--

BORE No: 8
PROJECT No: 49608.01
DATE: 26/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.09m Stickup
		FILLING (Topsoil?): Dark grey, fine to medium grained sand filling, trace clay, abundant rootlets to 0.15m, saturated		D,PID	0.1		<1ppm		From -0.1m to 0m, bentonite plug
	0.3	From 0.2m, clay content decreasing		A,PID	0.25		<1ppm		From 0 to 0.05m, 50mm diameter Class 18 PVC casing
		SAND: Very loose to loose, grey, fine to medium grained sand, saturated		A,PID	0.5		<1ppm		
	1			A,PID	1.0		<1ppm		1
					1.5				From 0 to 3.05m, 5/2mm graded washed gravel filter
				S,PID			1,1,4 N = 5 <1ppm		From 0.05m to 3.05m, 50mm diameter Class 18 machine slotted PVC screen
	2				1.95				2
					3.0				3
				S,PID			0,0,1 N = 1 <1ppm		At 3.05m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Surface water present, all samples saturated

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.73 AHD
EASTING: 380815.3
NORTHING: 6366281.3
DIP/AZIMUTH: 90°/--

BORE No: 9
PROJECT No: 49608.01
DATE: 29/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.14m Stickup
		FILLING: Generally comprising (soft) grey clay filling with trace to some fine to medium grained sand, abundant rootlets to 0.15m, M>Wp		D,PID,pp	0.1		<1ppm, 40-60kPa		
				D,PID,pp	0.25		<1ppm, 40-60kPa		
				A,PID,pp	0.5		<1ppm, ~40kPa		From 0 to 0.8m, bentonite plug From 0 to 0.9m, 50mm diameter Class 18 PVC casing
	0.6								
		FILLING: Generally comprising (firm to stiff), grey clay filling with trace fine to medium grained sand, M>Wp		A,PID,pp	1.0		<1ppm, 50-80kPa		
		From 1.4m, trace orange mottling			1.5				
				S,PID,pp			<1ppm, 150kPa	▼	
	1.8				1.8				
		SANDY CLAY/CLAYEY SAND: Light grey clayey, fine to medium grained sandy clay/clayey sand, M>Wp/saturated			1.9				
				A,PID	2.0		<1ppm		
									From 0.8m to 3.9m, 5/2mm graded washed gravel filter From 0.9m to 3.9m, 50mm diameter Class 18 machine slotted PVC screen
	3.0				3.0				
		CLAY: Very soft, grey clay with trace to some silt, M>Wp							
		From 3.2m, trace to some shells		S,PID			0,0,0 N = 0 <1ppm		
					3.45				
	3.9								At 3.9m, end cap
		Bore discontinued at 3.9m, limit of investigation							

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 1.75m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.47 AHD
EASTING: 381155.4
NORTHING: 6366108.5
DIP/AZIMUTH: 90°/--

BORE No: 10-L
PROJECT No: 49608.01
DATE: 28/7/2011
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.17m Stickup
		FILLING: Generally comprising (firm), grey clay filling, abundant rootlets to 0.2m, M>Wp		D,PID,pp	0.1		<1ppm, 50-70kPa		
				A,PID,pp	0.25		<1ppm, 50-70kPa		
		From 0.3m, trace coal fines and shells							
				A,PID,pp	0.5		<1ppm, 60-90kPa		
	0.8	FILLING: Generally comprising (stiff), grey mottled orange clay filling, M>Wp							
	1			A,PID,pp	1.0		<1ppm, 100-110kPa	▼	1
	1.1	CLAYEY SAND/SANDY CLAY: Grey clayey, fine to medium grained clayey sand/sandy clay, saturated/ M>Wp							
					1.5				
				S			0,0,0		
				A,PID	1.8		N = 0		
		From 1.8m, sand content increasing							
					1.95				2 From 0 to 4m, bentonite plug
	2.3	CLAY: Very soft, grey clay with some/trace silt and shells, M>>Wp							From 0 to 4.77m, 5/2mm graded washed gravel filter
				A,PID	2.5		<1ppm		
		From 2.7m, shell content increasing							
				A,PID	3.0		<1ppm		3
				S,PID			0,0,0 N = 0 <1ppm		
					3.45				
	4.0	SANDY CLAY: Very soft, grey, silty fine grained sandy clay with some shells, M>>Wp Sand content increasing with depth							4
					4.5				From 0 to 4.77m, 50mm diameter Class 18 PVC casing
				S,PID			0,0,0 N = 0 <1ppm		
	4.94				4.95				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 1.1m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.47 AHD
EASTING: 381155.4
NORTHING: 6366108.5
DIP/AZIMUTH: 90°/--

BORE No: 10-L
PROJECT No: 49608.01
DATE: 28/7/2011
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SAND: Very loose, fine to medium grained sand with some abundant shells, saturated *(continued)*							
		From 5.2m, trace silt							
	6				6.0				From 4m to 7.7m, 5/2mm graded washed gravel filter
				S			0,0,0 N = 0		From 4.77m to 7.7m, 50mm diameter Class 18 machine slotted PVC screen
					6.45				
					6.5				
				S,PID			0,0,0 N = 0 <1ppm		
	7				6.95				
									At 7.7m, end cap
	8				8.0				
				S,PID			6,4,1 N = 5 <1ppm		
	8.45	Bore discontinued at 8.45m, limit of investigation			8.45				
	9								

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 1.1m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.47 AHD
EASTING: 381156.6
NORTHING: 6366108.1
DIP/AZIMUTH: 90°/--

BORE No: 10-U
PROJECT No: 49608.01
DATE: 28/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	FILLING: Generally comprising firm, grey clay filling, abundant rootlets to 0.2m, M>Wp							0.99m Stickup From -0.1m to 0.1m, bentonite plug From 0 to 0.1m, 50mm diameter Class 18 PVC casing
		From 0.3m, trace coal fines and shells							
	0.8	FILLING: Generally comprising stiff, grey mottled orange clay filling, M>Wp							
	1.1	CLAYEY SAND/SANDY CLAY: Grey clayey, fine to medium grained clayey sand/sandy clay, saturated/ M>Wp						▼	
		From 1.8m, sand content increasing							From 0.1m to 3.2m, 50mm diameter Class 18 machine slotted PVC screen From 0.2m to 3.2m, 5/2mm graded washed gravel filter
	2.3	CLAY: Grey clay with some/trace silt and shells, M>>Wp							
		From 2.7m, shell content increasing							
	3.2	Bore discontinued at 3.2m, limit of investigation							At 3.2m, end cap

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 1.1m

REMARKS: For sampling and testing details, refer to log 10-L

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.91 AHD
EASTING: 381564.4
NORTHING: 6366607.9
DIP/AZIMUTH: 90°/--

BORE No: 11
PROJECT No: 49608.01
DATE: 27/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		FILLING: Generally comprising, very soft, dark grey clay, trace gravel filling, abundant rootlets to 0.2m, moist, M>Wp		D,PID,pp	0.1		<1ppm, 10-20kPa		0.9m Stickup From -0.1m to 0.05m, bentonite plug
	0.3	From 0.2m, gravel content increasing From 0.2m, coal/ash gravel, firm		A,PID,pp	0.25		<1ppm, 70-90kPa		
		CLAY: Stiff, light grey/mottled orange clay, M>Wp		A,PID,pp	0.5		<1ppm, 130-150kPa		
	0.6	CLAYEY SAND: Light grey clayey, fine to medium grained sand, saturated						▼	
0	1			A,PID	1.0		<1ppm		1
	1.3	CLAY: Very soft, light grey clay with some fine to medium grained sand, trace whole/fragmented shells, M>Wp							
					1.5				From 0.05m to 3.1m, 5/2mm graded washed gravel filter From 0.1m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
		From 1.7m, shell content increasing		S,PID			0,0,0 N = 0 <1ppm		
-1	2				1.95				2
-2	3				3.0				3 End Cap
				S,PID			0,0,0 N = 0 <1ppm		
	3.3	SAND: Very loose, grey, fine to medium grained sand, saturated							
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
-3	4								4
-4									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow flight auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.8m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.30 AHD
EASTING: 381446.2
NORTHING: 6365784.5
DIP/AZIMUTH: 90°/--

BORE No: 12
PROJECT No: 49608.01
DATE: 27/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									0.81m Stickup
		FILLING: Very soft, dark grey, fine to medium grained sandy clay, abundant rootlets to 0.2m, M>Wp		D,PID,pp	0.1		<1ppm, 10kPa		From 0 to 0.1m, bentonite plug From 0 to 0.2m, 50mm diameter Class 18 PVC casing
		From 0.2m, clay content increasing		A,PID,pp	0.25		<1ppm, 10-30kPa		
		From 0.4m to 0.6m, trace coal fragments and fine gravel		A,PID,pp	0.5		<1ppm, 60-90kPa		
		From 0.6m, sand content increasing, saturated		A,PID	0.7		<1ppm		
	0.8	CLAY: Firm, light and dark grey/mottled orange clay, M>Wp		A,PID,pp	1.0		<1ppm, 80-110kPa		
	1.2	SANDY CLAY: Very soft, grey, fine to medium grained sandy clay, trace orange mottling, M>Wp			1.5				
				S,PID			0,0,0 N = 0 <1ppm		From 0.1m to 3.2m, 5/2mm graded washed gravel filter From 0.2m to 3.2m, 50mm diameter Class 18 machine slotted PVC screen
					1.95				
	2.5	CLAY: Very soft, grey clay, M>Wp							
					3.0				
				S,PID			0,0,0 N = 0 <1ppm		At 3.2m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Peade **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Surface water present, all samples saturated

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.07 AHD
EASTING: 381825.3
NORTHING: 6366286.6
DIP/AZIMUTH: 90°/--

BORE No: 13
PROJECT No: 49608.01
DATE: 27/7/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									0.80m Stickup
0		SILTY CLAY: (Firm), dark grey silty clay, trace fine grained sand, M>Wp		A,PID	0.05		<1ppm		From 0 to 0.15m, bentonite plug From 0m to 0.25m, 50mm diameter Class 18 PVC casing
		From 0.2m, stiff		A,PID,pp	0.25		<1ppm, 180-220kPa		
	0.4	SANDY CLAY: (Soft to very soft), grey, fine grained sandy clay, M>Wp		A,PID	0.5		<1ppm	▼	
-1	1			A,PID,pp	1.0		<1ppm, <10kPa		1
	1.3	SILTY CLAY: Very soft, grey silty clay, some shells, trace fine grained sand, M>Wp			1.5				
				S,PID			0,0,0 N = 0 <1ppm		From 0.15m to 3.15m, 5/2mm graded washed gravel filter From 0.25m to 3.15m, 50mm diameter Class 18 machine slotted PVC screen
-2	2				1.95				2
	3	At 3.0m, abundant shells			3.0				3
-3				S,PID			0,0,0 N = 0 <1ppm		At 3.15m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
-4	4								4

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382064.7
NORTHING: 6365959.3
DIP/AZIMUTH: 90°/--

BORE No: 14-L
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.09m Stickup
		CLAY: (Soft to firm), dark brown clay, some silt, trace fine grained sand, some rootlets, M>Wp		A,PID	0.05		<1ppm		
				A,PID	0.25		<1ppm		
	0.35	SILTY CLAY: Brown/orange silty clay, M>Wp		A,PID	0.5		<1ppm	▼	
	0.7	SANDY CLAY/CLAYEY SAND: Grey, fine to medium grained sandy clay/clayey sand, M>Wp/saturated							
	1.05	SAND: Grey, fine to coarse grained sand, saturated		A,PID	1.0		<1ppm		
				A,PID	1.3		<1ppm		
					1.5				
				S,PID			2,2,1 N = 3 <1ppm		
					1.95				
	2.5	CLAY: Very soft, grey clay, trace silt and fine grained sand, some shells, M>>Wp							
					3.0				
				S,PID			0,0,0 N = 0 <1ppm		
					3.45				
		At 4.5m, no sand			4.5				From 0 to 9.2m, bentonite plug/cave-in
				S,PID			0,0,0 N = 0 <1ppm		
					4.95				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.6m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382064.7
NORTHING: 6365959.3
DIP/AZIMUTH: 90°/--

BORE No: 14-L
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		CLAY: Very soft, grey clay, trace silt and fine grained sand, some shells, M>>Wp *(continued)*							From 0m to 10.5m, 50mm diameter Class 18 PVC casing
				S,PID	6.0		0,0,0 N = 0 <1ppm		
					6.45				
	7.0	CLAYEY SAND: Very loose, grey clayey fine to coarse grained sand, saturated							
				S,PID	7.5		0,0,0 N = 0 <1ppm		
					7.95				
	8.5	SAND: Grey, medium to coarse grained sand							
				S,PID	9.0		1,0,1 N = 1 <1ppm		
	9.3	CLAYEY SAND/SANDY CLAY: Loose/very soft grey clayey sand/sandy clay, saturated/M>Wp			9.45				From 9.2m to 9.5m, bentonite hole plug
	10.0								

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.6m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382064.7
NORTHING: 6365959.3
DIP/AZIMUTH: 90°/--

BORE No: 14-L
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
-10		SAND: Medium dense, grey, fine to coarse grained sand, trace petrified timber, some shells, saturated							
					10.5				
				S,PID			10,9,15 N = 24 <1ppm		
					10.95				
	11								11
-11									From 9.5m to 13.4m, 5/2mm graded washed gravel filter
	12								12 From 10.5m to 13.4m, 50mm diameter Class 18 machine slotted PVC screen
-12									
	13								13
									At 13.4m, end cap
	13.5	Bore discontinued at 13.5m, limit of investigation							
-13									
	14								14
-14									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.6m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382064.1
NORTHING: 6365956.2
DIP/AZIMUTH: 90°/--

BORE No: 14-U
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.35	CLAY: (Soft to firm), dark brown clay, some silt, trace fine grained sand, some rootlets, M>Wp							1.08m Stickup From -0.1 to 0.05m, bentonite plug From 0 to 0.1m, 50mm diameter Class 18 PVC casing
	0.7	SILTY CLAY: Brown/orange silty clay, M>Wp						▼	
	1.05	SANDY CLAY/CLAYEY SAND: Grey, fine to medium grained sandy clay/clayey sand, M>Wp/saturated							
	2.5	SAND: Grey, fine to coarse grained sand, saturated							From 0.05m to 3.1m, 5/2mm graded washed gravel filter From 0.1m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	3.0	CLAY: Very soft, grey clay, trace silt and fine grained sand, some shells, M>>Wp							At 3.0m, end cap
		Bore discontinued at 3.0m, limit of investigation							

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.6m

REMARKS: For sampling and testing details, refer to log 14-L

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 382080.4
NORTHING: 6366658.3
DIP/AZIMUTH: 90°/--

BORE No: 15-L
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	SILTY CLAY: (Very soft), brown silty clay, trace fine grained sand, M>Wp						▼	1.02m Stickup
	0.6	SILTY CLAY: Stiff, brown silty clay, orange in parts, trace fine grained sand, M>Wp							From 0 to 5m, bentonite plug/cave-in
		CLAYEY SAND/SANDY CLAY: Very loose/very soft, grey clayey sand/sandy clay, saturated/M>Wp							
		From 2.1m, abundant shells							From 0 to 6.05m, 50mm diameter Class 18 PVC casing
				S,PID	4.5		0,0,0 N = 0 <1ppm		
					4.95				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.2m

REMARKS: For sampling and testing details above 3.45m, refer to log 15-U

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 382080.4
NORTHING: 6366658.3
DIP/AZIMUTH: 90°/--

BORE No: 15-L
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		CLAYEY SAND/SANDY CLAY: Very loose/very soft, grey clayey sand/sandy clay, saturated/M>Wp *(continued)*							From 5m to 5.5m, bentonite hole plug
	6.2	SAND: Medium dense, grey, medium to coarse grained sand, some shells, saturated		S,PID	6.0		3,4,7 N = 11 <1ppm		
					6.45				
	7.0	SAND: Dense, light grey, fine to medium grained sand, saturated							From 5.5m to 8.95m, 5/2mm graded washed gravel filter
					7.5				From 6.05m to 8.95m, 50mm diameter Class 18 machine slotted PVC screen
				S,PID			6,14,20 N = 34 <1ppm		
					7.95				
									At 8.95m, end cap
	9.45	Bore discontinued at 9.45m, limit of investigation							

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.2m

REMARKS: For sampling and testing details above 3.45m, refer to log 15-U

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 382079.4
NORTHING: 6366657.9
DIP/AZIMUTH: 90°/--

BORE No: 15-U
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	SILTY CLAY: (Very soft), brown silty clay, trace fine grained sand, M>Wp		A,PID	0.05		<1ppm	▼	0.8m Stickup From 0 to 0.1m, bentonite plug From 0 to 0.2m, 50mm diameter Class 18 PVC casing
	0.6	SILTY CLAY: Stiff, brown silty clay, orange in parts, trace fine grained sand, M>Wp		A,PID,pp	0.25		<1ppm, 140-220kPa		
				A,PID	0.5		<1ppm		
		CLAYEY SAND/SANDY CLAY: Very loose/very soft, grey clayey sand/sandy clay, saturated/M>Wp		A,PID	1.0		<1ppm		
					1.5				
				S,PID			0,0,0 N = 0 <1ppm		From 0.1m to 3.1m, 5/2mm graded washed gravel filter From 0.2m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
		From 2.1m, abundant shells			1.95				
					3.0				At 3.1m, end cap
				S,PID			0,0,0 N = 0 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from 0.2m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.53 AHD
EASTING: 382484.8
NORTHING: 6366473.9
DIP/AZIMUTH: 90°/--

BORE No: 16
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	SILTY CLAY: Dark grey silty clay, trace fine grained sand, some rootlets, M>Wp		A,PID	0.05		<1ppm		0.89m Stickup From 0 to 0.1m, bentonite plug From 0 to 0.2m, 50mm diameter Class 18 PVC casing
	0.45	CLAY: Grey/brown clay, orange in parts, some silt, trace fine grained sand, M>Wp		A,PID	0.25		<1ppm		
0	0.8	CLAY: Grey/brown clay, some fine grained sand, M>Wp		A,PID	0.5		<1ppm	▼	
	1	SANDY CLAY: (Very soft), grey, fine to medium grained sandy clay, orange in parts, M>Wp		A,PID	1.0				1
	1.3	CLAYEY SAND: Very loose, grey clayey, fine to medium grained sand, some shells, saturated			1.5				
-1				S,PID			0,0,0 N = 0 <1ppm		From 0.1m to 3.1m, 5/2mm graded washed gravel filter From 0.2m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	2				1.95				2
-2									
	3				3.0				3
	3.0	SILTY CLAY: Very soft, grey silty clay, trace fine grained sand, M>Wp		S,PID			0,0,0 N = 0 <1ppm		At 3.1m, end cap
-3	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								4
-4									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.7m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.55 AHD
EASTING: 382722.4
NORTHING: 6366136.6
DIP/AZIMUTH: 90°/--

BORE No: 17
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.02m Stickup
	0.0	SILTY CLAY: (Soft), brown silty clay, trace fine grained sand and rootlets, M>Wp		A,PID	0.05		<1ppm		From 0 to 0.05m, bentonite plug
	0.2	CLAY: Stiff to very stiff, brown clay, some orange mottling, trace to some silt, M>Wp		A,PID,pp	0.25		<1ppm, 120-240kPa		From 0 to 0.1m, 50mm diameter Class 18 PVC casing
0	0.55	SAND: Grey/brown, fine to medium grained sand, trace silt, saturated		A,PID	0.5		<1ppm	▼	
	1			A,PID	1.0		<1ppm		
-1		From 1.5m, very loose, fine to coarse grained sand, saturated			1.5				From 0.05m to 3.0m, 5/2mm graded washed gravel filter
				S,PID			0,0,0 N = 0 <1ppm		
	2				1.95				From 0.1m to 3.0m, 50mm diameter Class 18 machine slotted PVC screen
-2		From 2.1m, some clay		S,PID			0,0,0 N = 0 <1ppm		
					2.4				
	3								
	3.0	SILTY CLAY: Very soft, grey silty clay, trace fine grained sand, M>Wp			3.0				
-3				S,PID			0,0,0 N = 0 <1ppm		At 3m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
	4								
-4									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.80 AHD
EASTING: 382107.9
NORTHING: 6366921.4
DIP/AZIMUTH: 90°/--

BORE No: 18
PROJECT No: 49608.01
DATE: 11/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.44m Stickup
		SILTY CLAY: (Very soft), dark brown silty clay, some rootlets, M>>Wp		A,PID	0.05		<1ppm		From 0 to 0.05m, 50mm diameter Class 18 PVC casing
		Stiffness increasing with depth		A,PID	0.25		<1ppm		From -0.1 to 0.2m, bentonite plug
	0.35	SILTY CLAY: Stiff, grey/brown silty clay, M>Wp		A,PID,pp	0.5		<1ppm, 120-180kPa		
	0.65	CLAYEY SAND: (Very loose to loose), grey, medium to coarse grained clayey sand, some shells, saturated		A,PID	1.0		<1ppm		
	1.2	SANDY CLAY: (Very soft), grey, fine grained clayey sand, some shells, M>>Wp, grading to clayey sand			1.5				
				S,PID			0,0,0 N = 0 <1ppm		From 0.05m to 3.05m, 50mm diameter Class 18 machine slotted PVC screen
					1.95				From 0m to 3.05m, 5/2mm graded washed gravel filter
					3.0				At 3.05m, end cap
				S,PID			0,0,0 N = 0 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Surface water present, all samples saturated

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.55 AHD
EASTING: 383371.6
NORTHING: 6366830.6
DIP/AZIMUTH: 90°/--

PIT No: 19
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILLING: Generally comprising very soft to soft, silty clay filling, trace fine to medium grained sand and subangular gravel, abundant rootlets, M>Wp		D,PID,pp	0.05		<1ppm, 20-50kPa		
		SILTY CLAY: Firm to stiff, grey silty clay with trace fine to medium grained sand, M>Wp		D,PID,pp	0.25		<1ppm, 60-110kPa		
		From 0.4m, firm, trace orange mottling		D,PID,pp	0.45		<1ppm, 50-80kPa	▽	
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: From 0.4m, seepage

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 383151.6
NORTHING: 6366625.2
DIP/AZIMUTH: 90°/--

BORE No: 20-L
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									1.32m Stickup
		SILTY CLAY: Grey/brown silty clay, trace fine to medium grained sand and rootlets, M>Wp		A,PID	0.05		<1ppm		
				A,PID	0.25		<1ppm		
	0.3	SILTY CLAY: (Stiff), grey/brown silty clay, trace fine grained sand, orange in parts, M>Wp		A,PID	0.5		<1ppm	▼	
	0.6	CLAYEY SAND/SANDY CLAY: (Very loose/very soft), brown, fine grained clayey sand/sandy clay, saturated/M>>Wp							
0	1			A,PID	1.0		<1ppm		1
					1.5				
	1.6	SILTY CLAY: Very soft, grey silty clay, trace to some fine grained sand, M>Wp		S,PID			0,0,0 N = 0 <1ppm		
-1	2				1.95				2
	2.5	SILTY CLAY: Very soft, dark grey silty clay, trace fine grained sand, M>Wp							
-2	3				3.0				3
				S,PID			0,0,0 N = 0 <1ppm		From 0 to 6.5m, bentonite plug/cave-in
					3.45				
-3									From 0 to 7.6m, 50mm diameter Class 18 PVC casing
	4	From approximately 4.0m, trace shells							4
					4.5				
-4				S,PID			0,0,0 N = 0 <1ppm		
					4.95				

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 383151.6
NORTHING: 6366625.2
DIP/AZIMUTH: 90°/--

BORE No: 20-L
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SILTY CLAY: Very soft, dark grey silty clay, trace fine grained sand, M>Wp *(continued)*							
	5.5	SANDY CLAY: Very soft, grey/brown, fine to medium grained sandy clay, some shells, M>Wp							
-5									
	6				6.0				6
				S,PID			0,0,0 N = 0 <1ppm		
		From 6.3m to 6.4m, abundant shells			6.45				
-6									From 6.5m to 7m, bentonite hole plug
	7								7
	7.0	CLAYEY SAND: Very loose, grey clayey, fine to coarse grained sand, saturated							
					7.5				
-7				S,PID			0,0,0 N = 0 <1ppm		
	7.8	SAND: Very loose, medium to coarse grained sand, saturated							
	8				7.95				8
-8									From 7m to 10.6m, 5/2mm graded washed gravel filter
	9				9.0				9
				S,PID			3,2,2 N = 4 <1ppm		From 7.6m to 10.6m, 50mm diameter Class 18 machine slotted PVC screen
					9.45				
-9									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 383151.6
NORTHING: 6366625.2
DIP/AZIMUTH: 90°/--

BORE No: 20-L
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
-10		SAND: Very loose, medium to coarse grained sand, saturated *(continued)*							
		At 10.5m, medium dense		S,PID	10.5		3,4,8 N = 12 <1ppm		At 10.6m, end cap
	10.95	Bore discontinued at 10.95m, limit of investigation			10.95				
-11	11								11
	12								12
-12	13								13
-13	14								14
-14									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.72 AHD
EASTING: 383152
NORTHING: 6366626.2
DIP/AZIMUTH: 90°/--

BORE No: 20-U
PROJECT No: 49608.01
DATE: 11/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	SILTY CLAY: Grey/brown silty clay, trace fine to medium grained sand and rootlets, M>Wp							0.87m Stickup From -0.1m to 0.05m, bentonite plug From 0 to 0.2m, 50mm diameter Class 18 PVC casing
	0.3	SILTY CLAY: (Stiff), grey/brown silty clay, trace fine grained sand, orange in parts, M>Wp						▼	
	0.6	CLAYEY SAND/SANDY CLAY: (Very loose/very soft), brown, fine grained clayey sand/sandy clay, saturated/M>>Wp							
	1.6	SILTY CLAY: Very soft, grey silty clay, trace to some fine grained sand, M>Wp							From 0.05m to 3.2m, 5/2mm graded washed gravel filter From 0.2m to 3.2m, 50mm diameter Class 18 machine slotted PVC screen
	2.5	SILTY CLAY: Very soft, dark grey silty clay, trace fine grained sand, M>Wp							
	3.2	Bore discontinued at 3.2m, limit of investigation							At 3.2m, end cap

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS: For sampling and testing details, refer to log 20-L

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.53 AHD
EASTING: 383689.6
NORTHING: 6366661
DIP/AZIMUTH: 90°/--

BORE No: 21
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	SILTY CLAY: Grey silty clay, trace fine grained sand and gravel, some rootlets, M<Wp		A,PID	0.05		<1ppm		0.79m Stickup From 0 to 0.1m, bentonite plug From 0 to 0.2m, 50mm diameter Class 18 PVC casing
		SILTY CLAY: Grey/brown silty clay, some fine grained sand, M>Wp		A,PID	0.25		<1ppm	▼	
0				A,PID	0.5		<1ppm		
	1			A,PID	1.0		<1ppm		1
	1.3	SILTY CLAY: Very soft, grey silty clay, M>Wp Grading to very soft sandy silty clay with trace shells			1.5				
-1				S,PID			0,0,0 N = 0 <1ppm		From 0.1m to 3.1m, 5/2mm graded washed gravel filter From 0.2m to 3.1m, 50mm diameter Class 18 machine slotted PVC screen
	2				1.95				2
	2.5	SILTY CLAY: Very soft, grey/brown silty clay, M>>Wp							
-2					3.0				
	3			S,PID			0,0,0 N = 0 <1ppm		3 At 3.1m, end cap
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				
-3									
	4								4
-4									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.3m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.68 AHD
EASTING: 383683.9
NORTHING: 6366934.5
DIP/AZIMUTH: 90°/--

BORE No: 22
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	SILTY CLAY: Brown silty clay, trace fine grained sand and rootlets, M<Wp		A,PID	0.05		<1ppm		0.97m Stickup
		SILTY CLAY: Brown silty clay, orange in parts, trace fine grained sand, M>Wp		A,PID	0.25		<1ppm		From 0 to 0.3m, bentonite plug
				A,PID	0.5		<1ppm		From 0 to 0.6m, 50mm diameter Class 18 PVC casing
0	0.7	SILTY CLAY: Very soft, grey silty clay, some fine grained sand, M>Wp						▼	
1				A,PID,pp	1.0		<1ppm, <20kPa		1
	1.2	SILTY CLAY: Very soft, brown silty, trace fine grained sand, M>Wp							
					1.5				
-1				S,PID			0,0,0 N = 0 <1ppm		
2					1.95				2 From 0.3m to 3.45m, 5/2mm graded washed gravel filter From 0.6m to 3.5m, 50mm diameter Class 18 machine slotted PVC screen
-2									
3		At 3.0m, trace shells			3.0				3
				S,PID			0,0,0 N = 0 <1ppm		
	3.45	Bore discontinued at 3.45m, limit of investigation			3.45				At 3.5m, end cap
-3									
4									4
-4									

RIG: Jet Track TD107 **DRILLER:** Wakeman **LOGGED:** Wroblewski **CASING:** Nil

TYPE OF BORING: 100mm ID, 180mm OD, Hollow Flight Auger

WATER OBSERVATIONS: Free groundwater observed from approximately 0.7m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.06 AHD
EASTING: 381434.4
NORTHING: 6366745.9
DIP/AZIMUTH: 90°/--

PIT No: 23
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2		FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace clay, ash fines/gravel, abundant rootlets to 0.15m/0.2m, moist		D,PID	0.1		<1ppm		
		From 0.15m, ash gravel/fines content increasing		D,PID	0.25		<1ppm		
	0.4	FILLING: Generally comprising fine to medium grained sand filling, trace coal fines, saturated		D,PID	0.5		<1ppm	▼	
1	1	Coal fine content decreasing with depth		D,PID	1.0		<1ppm		1
				D,PID	1.4		<1ppm		
	1.5	Pit discontinued at 1.5m, limit of investigation							
0	2								2
-1	3								3
-2	4								4

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.87 AHD
EASTING: 381420
NORTHING: 6366707.8
DIP/AZIMUTH: 90°/--

PIT No: 24
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace clay and plastic bottle fragments, ash gravel/fines, abundant rootlets to 0.15m/0.2m, moist to wet		D,PID	0.1		<1ppm		
				D,PID	0.25		<1ppm		
	0.3	FILLING: Generally comprising grey, fine to medium grained sand filling, trace ash fines/gravel, saturated		D,PID	0.5		<1ppm	▼	
	0.6	SAND: Light grey, fine to medium grained sand, saturated							
	1			D,PID	1.0		<1ppm		1
	1.1	SAND: Yellow, fine to medium grained sand, saturated		D,PID	1.2		<1ppm		
	1.4	Pit discontinued at 1.4m, limit of investigation							
	2								2
	3								3
	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.79 AHD
EASTING: 381319
NORTHING: 6366310.3
DIP/AZIMUTH: 90°/--

PIT No: 25
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	FILLING: Generally comprising ash filling, damp		D,PID	0.05		<1ppm		
		SAND: Dark grey sand, with some clay to 0.4m, moist to wet Moisture content increasing with depth		D,PID	0.25		<1ppm		
				D,PID	0.5		<1ppm	▼	
	0.6	SAND: Light grey, fine to medium grained sand, saturated							
	1			D,PID	1.0		<1ppm		1
	1.3	SAND: Light grey mottled orange, fine to medium grained sand with some clay, saturated							
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
	2								2
	3								3
	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS: Next to concrete trough (fig tree)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.81 AHD
EASTING: 381325.5
NORTHING: 6366330.2
DIP/AZIMUTH: 90°/--

PIT No: 26
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace to some clay from 0 to 0.35m, trace bricks, porcelain, corrugated iron, oyster shells to 0.3/0.4m, moist		D,PID	0.05		<1ppm		
				D,PID	0.25		<1ppm		
	0.45	SAND: Grey, fine to medium grained sand, wet		D,PID	0.5		<1ppm	▼	
	0.6	SAND: Light grey, fine to medium grained sand, trace orange staining, saturated							
	1			D,PID	1.0		<1ppm		1
	1.5			D,PID	1.5		<1ppm		
	1.6	SAND/CLAYEY SAND: Light grey mottled orange, fine to medium grained sand with some clay, saturated							
		Pit discontinued at 1.6m, limit of investigation							
	2								2
	3								3
	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS: Fig tree - adjacent to track

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.97 AHD
EASTING: 381214.2
NORTHING: 6366337.4
DIP/AZIMUTH: 90°/--

PIT No: 27
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILLING: Generally comprising brown/orange gravelly, fine to medium grained sand filling, trace clay, abundant rootlets to 0.15m, damp		D,PID	0.05		<1ppm		
				D,PID	0.25		<1ppm		
	0.4	SAND: Dark grey, fine to medium grained sand with some clay, moist		D,PID	0.5		<1ppm		
	0.7	SAND: Light grey, fine to medium grained sand, saturated							
1	1			D,PID	1.0		<1ppm	▼	1
	1.1	SAND: Light grey mottled orange, fine to medium grained sand, with some clay, saturated							
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
0	2								2
-1	3								3
-2	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.0m

REMARKS: Near main overhead powerline

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.17 AHD
EASTING: 381443.9
NORTHING: 6365795.5
DIP/AZIMUTH: 90°/--

PIT No: 28
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.3	FILLING: Very soft to soft, dark grey clay filling with trace gravel, fine to medium grained sand and rootlets to 0.2m, M>Wp		D,PID,pp	0.05		<1ppm, <10kPa		
				D,PID,pp	0.25		<1ppm, 20-30kPa		
	0.8	SAND: Grey, fine to medium grained sand with some clay, wet to saturated		D,PID	0.5		<1ppm	▼	
0	1	CLAY: Stiff, grey mottled orange clay, trace sand, M>Wp Sand content increasing with depth		D,PID,pp	1.0		<1ppm, 120-150kPa		1
				D,PID	1.5				
-1	1.6	Pit discontinued at 1.6m, limit of investigation							2
-2	3								3
-3	4								4

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS: Along river bank, adjacent to track - corrugated iron/timber heap

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.38 AHD
EASTING: 381477.4
NORTHING: 6365841.9
DIP/AZIMUTH: 90°/--

PIT No: 29
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SAND (Filling?): Generally comprising dark grey, fine to medium grained sand (filling?), moist		D,PID	0.05		<1ppm		
		From 0.1m, light grey							
	0.3	CLAY: Stiff, grey mottled orange clay, M>Wp		D,PID,pp	0.25		<1ppm, 150-200kPa		
		CLAY: Stiff to very stiff, dark grey clay, trace fine to medium grained sand, M>Wp		D,PID,pp	0.5		<1ppm, 180-300kPa		
	0.6	CLAY: Stiff, grey mottled orange clay, trace sand, M>Wp		D,PID,pp	1.0		<1ppm, 110-170kPa	▼	
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.4m

REMARKS: Brick pavers on surface

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.10 AHD
EASTING: 382087.1
NORTHING: 6366178.1
DIP/AZIMUTH: 90°/--

PIT No: 30
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.1	BRICKS (paved)		D,PID	0.05		<1ppm		
	0.15	FILLING: Generally comprising light grey, fine to medium grained sand filling, trace dark grey clay nodules, trace cobbles, moist		D,PID,pp	0.25		<1ppm,110-210kPa		
	0.4	CLAY: Stiff, dark grey clay, M>Wp							
		CLAY: Firm, light grey mottled brown/orange clay, M>Wp		D,PID,pp	0.5		<1ppm, 70-100kPa		
		From 0.8m, trace mottling, stiff							
0	1			D,PID,pp	1.0		<1ppm, 100-150kPa		1
		From 1.2m, trace to some fine to medium grained sand and brown/orange mottling, firm							
				D,PID,pp	1.5		<1ppm, 50-70kPa	▷	
	1.6	Pit discontinued at 1.6m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

5 10 15 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage observed from approximately 1.5m

REMARKS: Demolished buildings/adjacent to mature tree

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.06 AHD
EASTING: 382154.7
NORTHING: 6366173.5
DIP/AZIMUTH: 90°/--

PIT No: 31
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.1	FILLING: Generally comprising dark grey clay filling, trace coal gravel, abundant rootlets, M>Wp		D,PID	0.05		<1ppm		
	0.3	FILLING: Firm, light grey/brown mottled orange clay filling, trace fine to medium grained sand, M>Wp		D,PID,pp	0.25		<1ppm, 70-110kPa		
		FILLING: Very stiff, dark grey clay filling, trace coal gravel/fines, M>Wp		D,PID,pp	0.5		<1ppm, 200-230kPa		
	0.6	CLAY: Stiff, light grey mottled orange clay, M>Wp							
0	1			D,PID,pp	1.0		<1ppm, 140-170kPa		1
	1.35	SAND: Light grey, fine to medium grained with trace to some orange indurated sand nodules, wet to saturated		D,PID	1.5		<1ppm	▽	
	1.6	Pit discontinued at 1.6m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

Dynamic Penetrometer Test (blows per mm): 5 10 15 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage observed from approximately 1.4m

REMARKS: Adjacent to demolished house, septic pit and mature tree

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.34 AHD
EASTING: 381331.8
NORTHING: 6366750.4
DIP/AZIMUTH: 90°/--

PIT No: 32
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.3	FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace gravel, building rubble, rootlets, moist to wet		D,PID	0.1		<1ppm		
				D,PID	0.25		<1ppm		
		SAND: Light grey, fine to medium grained sand, saturated		D,PID	0.5		<1ppm	▼	
1	1.0	Pit discontinued at 1.0m, limit of investigation, collapse		D,PID	1.0		<1ppm		1
0	2								2
-1	3								3
-2	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.15 AHD
EASTING: 381332.9
NORTHING: 6366770.9
DIP/AZIMUTH: 90°/--

PIT No: 33
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2		FILLING: Light grey, fine to medium grained sand filling, trace rootlets to 0.05m, wet to saturated		D	0.1				
				D,PID	0.25		<1ppm	▼	
				D,PID	0.5		<1ppm		
1	1			D,PID	1.0		<1ppm		1
1	1.2	FILLING: (Very soft), brown clay filling with trace coal/ash fines and gravel, M>Wp		D,PID,pp	1.3		~2ppm, <10kPa		
	1.3	Pit discontinued at 1.3m, due to collapse							
0	2								2
-1	3								3
-2	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.24 AHD
EASTING: 381370.1
NORTHING: 6366725
DIP/AZIMUTH: 90°/--

PIT No: 34
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.15	FILLING: Generally comprising ash filling, damp		D,PID	0.1		<1ppm		
	0.3	FILLING: Dark grey, fine to medium grained sand and ash fragments/gravel/fines filling, moist		D,PID	0.25		<1ppm	▼	
		FILLING: Dark grey, fine to medium grained sand and ash fines filling, saturated		D,PID	0.5		<1ppm		
	0.6	SAND: Light grey, fine to medium grained sand, saturated							
1	1.1			D,PID	1.0		<1ppm		1
		Pit discontinued at 1.1m, due to collapse							
0	2								2
-1	3								3
-2	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.00 AHD
EASTING: 381387.5
NORTHING: 6366720.6
DIP/AZIMUTH: 90°/--

PIT No: 35
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2									5 10 15 20
		FILLING: Dark grey, fine to medium grained sand filling, some ash fines, trace rootlets to 0.05m, saturated		D,PID	0.2		<1ppm	▼	
				D,PID	0.25		<1ppm		
	0.4	FILLING: Light grey, fine to medium grained sand filling, trace ash fines, saturated		D,PID	0.5		<1ppm		
	0.6	SAND: Yellow, fine to medium grained sand, saturated							
1	1			D,PID	1.0		<1ppm		1
	1.1	Pit discontinued at 1.1m, due to collapse							
0	2								2
-1	3								3
-2	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 4.11 AHD
EASTING: 381607.1
NORTHING: 636712
DIP/AZIMUTH: 90°/--

PIT No: 36
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
4	0.06	FILLING: Generally comprising orange, fine to medium grained sandy subangular/subrounded gravel filling, humid		D,PID	0.05		<1ppm		
	0.08			D,PID	0.07		<1ppm		
				D,PID	0.25		<1ppm		
	0.3	FILLING: Generally comprising dark grey, fine to medium grained sand and ash gravel/fines filling, humid							
		FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace coal fines, humid		D,PID	0.5		<1ppm		
		SAND: Light grey, fine to medium grained sand, humid							
	1			D,PID	1.0		<1ppm		1
3	1.1	INDURATED SAND: Brown, fine/medium grained indurated sand, moist							
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
	2								2
2									
	3								3
1									
	4								4
0									

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Former driveway

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.88 AHD
EASTING: 381611
NORTHING: 6367092.7
DIP/AZIMUTH: 90°/--

PIT No: 37
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SAND: Dark grey, fine to medium grained sand, moist		D,PID	0.1		<1ppm		
				D,PID	0.25		<1ppm		
	0.3	SAND: Light grey, fine to medium grained sand, moist to wet		D,PID	0.5		<1ppm		
3	0.9								
	1	INDURATED SAND: Dark brown, fine to medium grained sand (cemented), wet		D,PID	1.0		<1ppm		1
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
2	2								2
1	3								3
0	4								4
-1									

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Former building footprint

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 4.07 AHD
EASTING: 381594.9
NORTHING: 6367090.7
DIP/AZIMUTH: 90°/--

PIT No: 38
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
4		FILLING: Generally comprising grey/brown, fine to medium grained sand filling, some organic matter		D,PID	0.1		<1ppm		
		From 0.15m, wood fragments/branches/trunks		D,PID	0.25		<1ppm		
	0.3	FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace coal/ash fines, moist		D,PID	0.5		<1ppm		
	0.6	SAND: Light grey, fine to medium grained sand, moist							
3	1			D,PID	1.0		<1ppm		1
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
2	2								2
1	3								3
0	4								4

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit excavated through stockpile of tree branches and trunks approximately 0.3m high

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.34 AHD
EASTING: 381685.8
NORTHING: 6367065
DIP/AZIMUTH: 90°/--

PIT No: 39
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILLING: Generally comprising dark grey, fine to medium grained sand filling, abundant roolets, moist		D,PID	0.1		<1ppm		
		From 0.15m to 0.25m, trace rootlets		D,PID	0.25		<1ppm		
	0.3			D,PID	0.3		<1ppm		
	0.35	FILLING: Generally comprising dark grey, fine to medium grained sand filling with trace gravel, ash gravel, cobbles and brick fragments, moist		D,PID	0.4		<1ppm		
	0.45			D,PID	0.5		<1ppm		
		FILLING: Generally comprising orange, fine to medium grained sandy subangular/subrounded gravel filling, trace ash/coal fragments, humid							
	0.7	SAND (Filling?): Dark, grey, fine to medium grained sand (filling?), moist							
	1.0	SAND: Light grey, fine to medium grained sand, moist to wet		D,PID	1.0		<1ppm	▼	1
		Moisture content increasing with depth							
	1.3	INDURATED SAND: Dark brown, fine to medium grained sand (coffee rock?), saturated		D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.1m

REMARKS: Bricks/brick fragments present from 0.1m to 0.3m in southern end of pit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.12 AHD
EASTING: 381675.4
NORTHING: 6367096
DIP/AZIMUTH: 90°/--

PIT No: 40
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		TOPSOIL: Grey, fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.1		<1ppm		
		From 0.2m to 0.6m, trace rootlets		D,PID	0.25		<1ppm		
	0.4	SAND: Light grey, fine to medium grained sand, moist		D,PID	0.5		<1ppm		
	1	Moisture content increasing with depth		D,PID	1.0		<1ppm	▼	1
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.1m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.03 AHD
EASTING: 381720.2
NORTHING: 6367003.5
DIP/AZIMUTH: 90°/--

PIT No: 41
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	FILLING: Generally comprising gypsum filling, abundant rootlets, damp		D,PID	0.1		<1ppm		
	0.4	FILLING: Dark grey, fine to medium grained sand filling, trace to some gravel and ash gravel, trace rootlets to 0.3m, humid to moist		D,PID	0.25		<1ppm		
		SAND: Dark grey, fine to medium grained sand, moist		D,PID	0.5		<1ppm		
	0.7	SAND: Yellow/light grey, fine to medium grained sand, saturated							
	1			D,PID	1.0		<1ppm	▼	
	1.5	Pit discontinued at 1.5m, limit of investigation		D,PID	1.5		2ppm		

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.1m

REMARKS: Stockpile mound approximately 0.3m to 0.5m high

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.98 AHD
EASTING: 381808.9
NORTHING: 6367053.6
DIP/AZIMUTH: 90°/--

PIT No: 42
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILLING: Generally comprising loose gravel (roadbase?) and dark grey, fine to medium grained sand filling, abundant rootlets, humid to moist		D,PID	0.05		<1ppm		
	0.3	FILLING: Generally comprising ash gravel/fines and dark grey, fine to medium grained sand filling, dry		D,PID	0.25		<1ppm		
		FILLING: Generally comprising grey, fine to medium grained sand filling, trace coal fines/gravel, moist		D,PID	0.5		<1ppm		
2	0.95	INDURATED SAND: Dark brown, fine to medium grained indurated sand, moist		D,PID	1.0		<1ppm		1
		Moisture content increasing with depth						▼	
	1.2	SAND: Light grey, fine to medium grained sand, saturated							
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
1	2								2
0	3								3
-1	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.25m

REMARKS: Adjacent to gate (joining two lots in northern portion of site). Loose gravel road

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.07 AHD
EASTING: 381799.6
NORTHING: 6367065.6
DIP/AZIMUTH: 90°/--

PIT No: 43
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	FILLING: Generally comprising dark grey, fine to medium grained sand filling with trace gravel, coal/ash gravel, slag, glass, paint, abundant rootlets, humid		D,PID	0.05		<1ppm		
		Sand content increasing with depth .		D,PID	0.25		<1ppm		
		No deleterious material from 0.1m							
		SAND (Filling?): Generally comprising orange/brown, fine to medium grained sand (filling?), trace coal/ash fines, moist		D,PID	0.5		<1ppm		
	0.9	SAND: Light grey/brown, fine to medium grained sand, moist to wet		D,PID	1.0		<1ppm		
		Moisture content increasing with depth						▼	
				D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.3m

REMARKS: Demolished house (southern edge). Large tree roots at all depths.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.07 AHD
EASTING: 381793.9
NORTHING: 6367072.2
DIP/AZIMUTH: 90°/--

PIT No: 44
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.15	FILLING: Generally comprising grey, fine to medium grained sand filling, concrete slab from approximately 0.3m, trace coal gravel and fines, moist		D,PID	0.05		<1ppm		
		FILLING: Generally comprising dark grey/light grey/brown fine to medium grained sand filling, trace coal gravel and fines, moist		D,PID	0.25		<1ppm		
		At 0.3m, concrete slab		D,PID	0.5		<1ppm		
		From 0.6m, trace bricks							
2	1	Moisture content increasing with depth		D,PID	1.0		<1ppm	▼	1
				D,PID	1.5		<1ppm		
1	2 2.0	SAND: Light grey/brown, fine to medium grained sand, saturated							2
				D,PID	2.5		<1ppm		
0	3 3.0	Pit discontinued at 3.0m, limit of investigation							3
-1	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1m

REMARKS: Demolished house (western edge of house). Possible septic odour from 0.4m

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.16 AHD
EASTING: 381808.4
NORTHING: 6367074.1
DIP/AZIMUTH: 90°/--

PIT No: 45
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILLING: Generally comprising dark grey, fine to medium grained sand filling with trace bricks, brick fragments, terracotta pipe, timber, woodchips, abundant rootlets, moist		D,PID	0.05		<1ppm		
	0.3	FILLING: Generally comprising dark grey clayey, fine to medium grained clayey sand/sandy clay filling, moist		D,PID,pp	0.25		<1ppm, 130-160kPa		
		FILLING: Generally comprising grey, fine to medium grained sandy clay filling, trace coal fines, moist		D,PID	0.5		<1ppm		
	0.9	SAND: Dark brown, fine to medium grained sand, moist to wet		D,PID	1.0		<1ppm	▼	
		Moisture content increasing with depth		D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.4m

REMARKS: Demolished house (eastern edge of house)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.34 AHD
EASTING: 381843.9
NORTHING: 6367064.1
DIP/AZIMUTH: 90°/--

PIT No: 46
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING: Generally comprising grey, fine to medium grained sand filling, trace gravel, ash/coal gravel, oyster shells, organic matter, abundant rootlets to 0.1m, humid		D,PID	0.05		<1ppm		
				D,PID	0.25		<1ppm		
	0.4	FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace coal/ash fines, bricks, timber, moist							
		SAND: Light grey, fine to medium grained sand, moist to wet		D,PID	0.5		<1ppm	▼	
		Moisture content increasing with depth		D,PID	1.0		<1ppm		
	1.4	INDURATED SAND: Dark brown, fine to medium grained indurated sand, saturated		D,PID	1.5		<1ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS: Back boundary of demolished house

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.97 AHD
EASTING: 381813.9
NORTHING: 6367154.1
DIP/AZIMUTH: 90°/--

PIT No: 47
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILLING: Generally comprising grey gravelly sand filling with some sandy clay nodules, abundant rootlets, humid		D,PID	0.05		<1 ppm		
		FILLING: Generally comprising (very stiff), light grey mottled orange clay filling, trace rootlets, M>Wp		D,PID,pp	0.25		250-350kPa, <1 ppm		
	0.4	FILLING: Generally comprising dark grey, fine to medium grained sand filling, trace coal/ash fines, moist		D,PID	0.5		<1 ppm		
	0.7	SAND: Light grey, fine to medium grained sand, moist							
2	1	Moisture content increasing with depth		D,PID	1.0		<1 ppm	▼	1
	1.3	INDURATED SAND: Dark brown, fine to medium grained indurated sand, trace rounded gravel (riverstone), saturated		D,PID	1.5		<1 ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
1	2								2
0	3								3
-1	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.2m

REMARKS: Adjacent to driveway through main gate to lot. Road embankment ~0.3m to 0.4m higher than road

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.81 AHD
EASTING: 381975.4
NORTHING: 6367203.6
DIP/AZIMUTH: 90°/--

PIT No: 48
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0	FILLING: Generally comprising dark grey, fine to medium grained sand filling with trace gravel and building rubble to 0.2m, (bricks and concrete), and abundant rootlets to 0.15m, moist		D,PID	0.1		<1ppm		
				D,PID	0.25		<1ppm		
	0.3	SAND: Light grey, fine to medium grained sand, moist to wet		D,PID	0.5		<1ppm		
1	1	Moisture content increasing with depth		D,PID	1.0		<1ppm	▼	1
	1.2	INDURATED SAND: Brown, fine to medium grained indurated sand, saturated		D,PID	1.5		<1ppm		
0	1.6	Pit discontinued at 1.6m, limit of investigation							2
-1	2								3
-2	3								4
	4								

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.1m

REMARKS: Former building footprint

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.79 AHD
EASTING: 381976.7
NORTHING: 6367211.1
DIP/AZIMUTH: 90°/--

PIT No: 49
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.25	FILLING: Generally comprising grey, fine to medium grained sand filling with trace gravel, timber, concrete fragments and bricks, abundant rootlets, moist		D,PID	0.1		<1ppm		
		Abundant rootlets to 0.2m		D,PID	0.25		<1ppm		
		SAND: Light grey, fine to medium grained sand, moist to wet		D,PID	0.5		<1ppm	▼	
	0.7	SAND: Brown, fine to medium grained sand, saturated		D,PID	1.0		<1ppm		
	1.3	Pit discontinued at 1.3m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.6m

REMARKS: Trace bricks and roof tiles observed in upper 0.3m on southern side of pit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.83 AHD
EASTING: 381996.9
NORTHING: 6367189.1
DIP/AZIMUTH: 90°/--

PIT No: 50
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	TOPSOIL - Grey fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.1		<1 ppm		
		SAND - Light grey fine to medium grained sand, moist		D,PID	0.25		<1 ppm		
				D,PID	0.5		<1 ppm	▼	
	1.1	Moisture content increasing with depth		D,PID	1.0		<1 ppm		
		Pit discontinued at 1.1m, due to pit collapse							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 0.8m

REMARKS: Paint residue/ash at surface adjacent to pit (Sample Pit 50/0.05)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.12 AHD
EASTING: 381979.9
NORTHING: 6367156.3
DIP/AZIMUTH: 90°/--

PIT No: 51
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.2	TOPSOIL - Grey fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.1		<1 ppm		
		SAND - Light grey fine to medium grained sand, moist to wet		D,PID	0.25		<1 ppm		
				D,PID	0.5		<1 ppm		
2	1	Moisture content increasing with depth		D,PID	1.0		<1 ppm		1
				D,PID	1.5		<1 ppm		
1	1.6	Pit discontinued at 1.6m, limit of investigation							2
0	2								3
-1	3								4
	4								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.93 AHD
EASTING: 381939.7
NORTHING: 6367193.7
DIP/AZIMUTH: 90°/--

PIT No: 52
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING - Generally comprising grey-brown fine to medium grained sand filling, trace building rubble (bricks and iron), abundant rootlets to 0.2m, moist		D,PID	0.1		<1 ppm		
				D,PID,pp	0.25		<1 ppm, 60-90 kPa		
	0.3	FILLING - Generally comprising (firm), dark brown mottled orange clay filling, M>Wp		D,PID	0.4		<1 ppm		
	0.45	FILLING - Generally comprising grey fine to medium grained sand filling, trace coal/ash fines, moist		D,PID	0.5		<1 ppm		
		SAND - Light grey fine to medium grained sand, moist to wet							
	1			D,PID	1.0		<1 ppm		1
	1.3	INDURATED SAND - Dark brown fine to medium grained indurated sand, moist to wet							
				D,PID	1.5		<1 ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
	2								2
	3								3
	4								4

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.92 AHD
EASTING: 381951.6
NORTHING: 6367195.2
DIP/AZIMUTH: 90°/--

PIT No: 53
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING - Generally comprising grey/orange fine to medium grained sand filling with some concrete fragments, gravel, trace agricultural pipe and bricks, abundant rootlets to 0.2m, moist		D,PID	0.1		<1 ppm		
	0.25			D,PID,pp	0.25		<1 ppm, 110-140 kPa		
	0.35	FILLING - Generally comprising, (stiff), dark grey, trace mottled orange clay filling with some gravel, ash/coal fines and gravel and sand, M>Wp		D,PID	0.3		<1 ppm		
				D,PID	0.5		<1 ppm		
		FILLING - Generally comprising grey fine to medium grained sand filling with trace coal/ash fines, moist							
		SAND - Light grey fine to medium grained sand, moist							
		Moisture content increasing with depth		D,PID	1.0		<1 ppm	▼	
	1.1	Pit discontinued at 1.1m, due to collapse							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.0m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.99 AHD
EASTING: 381946.7
NORTHING: 6367172.6
DIP/AZIMUTH: 90°/--

PIT No: 54
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	FILLING - Generally comprising dark grey, fine to medium grained sand and asphalt filling, abundant rootlets to 0.01m, moist		D,PID	0.1		<1 ppm		
				D,PID	0.25		<1 ppm		
	0.35	FILLING - Generally comprising dark grey fine to medium grained sand filling, trace ash/coal fines, moist							
		SAND - Light grey fine to medium grained sand, moist		D,PID	0.5		<1 ppm		
	0.8	Moisture content increasing with depth							
		INDURATED SAND - Dark brown fine to medium grained indurated sand, saturated		D,PID	1.0		<1 ppm	▼	
	1.2	Pit discontinued at 1.2m, due to collapse							

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.0m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.62 AHD
EASTING: 382115.5
NORTHING: 6367309.9
DIP/AZIMUTH: 90°/--

PIT No: 55
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	FILLING - Dark grey fine to medium grained sand filling, abundant rootlets to 0.15m, moist		D,PID	0.05		<1 ppm		
				D,PID	0.25		<1 ppm		
	0.3	SAND / FILLING?: Generally comprising grey fine to medium grained sand (filling?), trace coal fines, moist		D,PID	0.5		<1 ppm		
	0.8	INDURATED SAND - Dark brown fine to medium grained indurated sand, moist		D,PID	1.0		<1 ppm		
	1.4	SAND - Light grey fine to medium grained sand, wet to saturated, moisture content increasing with depth		D,PID	1.5		<1 ppm	▼	
	1.6	Pit discontinued at 1.6m, limit of investigation							

5 10 15 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.4m

REMARKS: Adjacent to former dwelling. Terracotta water connection pipe at northern end of test pit

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.74 AHD
EASTING: 382075.4
NORTHING: 6367271.4
DIP/AZIMUTH: 90°/--

PIT No: 56
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.15	FILLING - Generally comprising grey fine to medium grained sand filling, trace gravel and brick fragments, moist		D,PID	0.1		<1 ppm		
				D,PID	0.25		<1 ppm		
		SAND / FILLING? - Generally comprising grey to light grey, fine to medium grained sand (filling?), trace coal fragments to approximately 0.7m, moist		D,PID	0.5		<1 ppm		
	0.8	INDURATED SAND - Light to dark brown fine to medium grained indurated sand, trace rounded gravel/riverstone, moist		D,PID	1.0		<1 ppm		1
				D,PID	1.5		<1 ppm		
2	1.7	Pit discontinued at 1.7m, limit of investigation							2
1									3
0									4
-1									

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.19 AHD
EASTING: 382093.4
NORTHING: 6367233.1
DIP/AZIMUTH: 90°/--

PIT No: 57
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING - Generally comprising grey fine to medium grained sand filling, trace coal fines/gravel, abundant rootlets, moist		D,PID	0.05		<1 ppm		
		FILLING - Generally comprising grey to light grey fine to medium grained sand filling, trace coal fines to 0.4m, moist		D,PID	0.25		<1 ppm		
				D,PID	0.5		<1 ppm		
	0.9	INDURATED SAND - Dark brown fine to medium grained indurated sand, trace rounded gravel/riverstone, wet to saturated		D,PID	1.0		<1 ppm		
		Moisture content increasing with depth		D,PID	1.5		<1 ppm	▼	
	1.7	Pit discontinued at 1.7m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.6m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.54 AHD
EASTING: 382184.5
NORTHING: 6367304.1
DIP/AZIMUTH: 90°/--

PIT No: 58
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	TOPSOIL - Grey fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.05		<1 ppm		
	0.4	SAND - Light grey-brown fine to medium grained sand, moist		D,PID	0.25		<1 ppm		
	1.2	SAND - Yellow/orange fine to medium grained sand, moist		D,PID	0.5		<1 ppm		
	1.6	SAND - Light yellow grained sand, moist to wet		D,PID	1.0		<1 ppm		
		Pit discontinued at 1.6m, limit of investigation		D,PID	1.5		<1 ppm		

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.27 AHD
EASTING: 382062.4
NORTHING: 6367206.3
DIP/AZIMUTH: 90°/--

PIT No: 59
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	TOPSOIL - (Firm), grey-brown fine to medium grained sandy clay/clayey sand topsoil, abundant rootlets, oyster shells/fragments from 0.1m, moist/M>Wp		D,PID,pp	0.1		<1 ppm, 60-110 kPa		
		SAND (FILLING?) - Grey fine to medium grained sand (filling?), oyster shell fragments from 0.3m, moist		D,PID	0.25		<1 ppm		
		From 0.15m to 0.25m, trace coal fines		D,PID	0.5		<1 ppm		
		From 0.4m, light brown/brown fine to medium grained sand							
	0.7	INDURATED SAND - Brown/dark brown fine to medium grained indurated sand, trace rounded gravel/riverstone, moist to wet		D,PID	1.0		<1 ppm		
		Moisture content increasing with depth		D,PID	1.5		<1 ppm	▼	
	1.6	Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.12 AHD
EASTING: 382036.6
NORTHING: 6367192.8
DIP/AZIMUTH: 90°/--

PIT No: 60
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.15	TOPSOIL - Grey, fine to medium grained sand topsoil, abundant rootlets to 0.1m, moist		D,PID	0.1		<1 ppm		
		SAND (FILLING)? - Grey fine to medium grained sand (filling?), moist		D,PID	0.25		<1 ppm		
		From 0.15m to 0.3m, trace coal fines		D,PID	0.5		<1 ppm		
	0.7	INDURATED SAND - Dark brown fine to medium grained indurated sand, trace rounded gravel/riverstone, wet to saturated		D,PID	1.0		<1 ppm	▼	
2	1			D,PID	1.5		<1 ppm		
	1.6	Pit discontinued at 1.6m, limit of investigation							
1	2								
0	3								
-1	4								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.00 AHD
EASTING: 381899.6
NORTHING: 6367194.3
DIP/AZIMUTH: 90°/--

PIT No: 61
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.17	FILLING - Generally comprising dark grey/grey/brown, fine to medium grained sand filling, with some coal fragment/fines and gravel, moist		D,PID	0.1		<1 ppm		
				D,PID	0.25		<1 ppm		
	0.4	FILLING - Generally comprising bricks, brick fragments, grey, fine to medium grained sand and coal gravel/fines filling, humid to moist							
				D,PID	0.5		<1 ppm		
	0.6	FILLING - Generally comprising dark grey/grey, fine to medium grained sand filling, trace coal fines, moist, moisture content increasing with depth						▼	
		INDURATED SAND - Dark brown fine to medium grained indurated sand, saturated							
2	1			D,PID	1.0		<1 ppm		1
	1.3	Pit discontinued at 1.3m, due to collapse							
1	2								2
0	3								3
-1	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.7m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.14 AHD
EASTING: 381889.4
NORTHING: 6367104.2
DIP/AZIMUTH: 90°/--

PIT No: 62
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	FILLING - Generally comprising coal/ash gravel/fines filling with dark grey fine to medium grained sand, dry to moist		D,PID	0.05		<1 ppm		
	0.4	FILLING - Generally comprising grey fine to medium grained sand filling with trace coal/ash fines, moist		D,PID	0.25		<1 ppm		
	0.6	SAND - Light yellow fine to medium grained sand, moist		D,PID	0.5		<1 ppm		
	1.3	SAND - Light grey fine to medium grained sand, moist		D,PID	1.0		<1 ppm	▼	
	1.6	INDURATED SAND - Dark brown fine to medium grained indurated sand, wet to saturated		D,PID	1.5		<1 ppm		
		Pit discontinued at 1.6m, limit of investigation							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket
LOGGED: Peade
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 1.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.00 AHD
EASTING: 381659.9
NORTHING: 6366104.4
DIP/AZIMUTH: 90°/--

PIT No: 63
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		TOPSOIL - (Stiff), dark grey clay topsoil, abundant rootlets to 0.15m, M>Wp		D,PID	0.05		<1 ppm		
				D,PID,pp	0.25		<1 ppm, 160-190 kPa		
	0.4	CLAY - Stiff to very stiff, grey mottled orange clay, M>Wp		D,PID,pp	0.5		<1 ppm, 180-230 kPa		
		From 0.7m, soft to firm, some fine to medium grained sand							
0	1			D,PID,pp	1.0		<1 ppm, 30-50 kPa		1
				D,PID,pp	1.5		<1 ppm, 60-80 kPa		
	1.6	Pit discontinued at 1.6m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Test pit under/next to footings of demolished house. Fibro sheeting found 0.5m south of pit (Sample Fibro 11)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.94 AHD
EASTING: 381383.6
NORTHING: 6366588
DIP/AZIMUTH: 90°/--

PIT No: 64
PROJECT No: 49608.01
DATE: 1/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.15	FILLING - Generally comprising orange-brown gravelly fine to medium grained sand filling, humid		D,PID	0.1		<1 ppm		
		FILLING - Generally comprising dark grey fine to medium grained sand filling, trace ash gravel to 0.15m/0.2m, rootlets to 0.3m, wet to saturated		D,PID	0.25		<1 ppm	▼	
		Ash gravel content decreasing from 0.4m		D,PID	0.5		<1 ppm		
	0.6	SAND - Grey/yellow fine to medium grained sand, saturated							
	1			D,PID	1.0		<1 ppm		1
				D,PID	1.3		<1 ppm		
	1.4	Pit discontinued at 1.4m, limit of investigation							
0	2								2
-1	3								3
-2	4								4
-3									

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.53 AHD
EASTING: 381732.1
NORTHING: 6367000.6
DIP/AZIMUTH: 90°/--

PIT No: 65
PROJECT No: 49608.01
DATE: 2/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.3	FILLING - Generally comprising grey-brown fine to medium grained sand filling, trace dark grey sandy clay nodules, abundant rootlets, moist		D,PID	0.1		<1 ppm		
				D,PID	0.25		<1 ppm		
		FILLING - Generally comprising grey/dark grey/brown fine to medium grained sand with some clay, trace rootlets, corrugated iron, bricks, insulation batts, rags, metal rods/tracks and concrete slabs, wet to saturated		D,PID	0.5		<1 ppm	▼	
	1	From 0.9m, dark grey-black		D,PID	1.0		<1 ppm		1
	1.1	Pit discontinued at 1.1m, due to refusal on building rubble							
	2								2
	3								3
	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.7m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 3.10 AHD
EASTING: 381947.3
NORTHING: 6367136.3
DIP/AZIMUTH: 90°/--

PIT No: 66
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.15	FILLING - Generally comprising ash gravel/fines filling, some dark grey, fine to medium grained sand and rootlets, humid to moist		D,PID	0.05		<1 ppm		
		FILLING - Generally comprising grey fine to medium grained sand filling, trace ash, gravel/fines, moist		D,PID	0.25		<1 ppm		
		Light grey from 0.4m		D,PID	0.5		<1 ppm		
2	0.9	INDURATED SAND - Dark brown fine to medium grained indurated sand, moist to wet		D,PID	1.0		<1 ppm		
		Moisture content increasing with depth		D,PID	1.5		<1 ppm	▼	
1	1.7	Pit discontinued at 1.7m, limit of investigation							
0									
-1									

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 1.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.10 AHD
EASTING: 381331.8
NORTHING: 6366663.8
DIP/AZIMUTH: 90°/--

PIT No: 67
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.15	TOPSOIL - Dark grey fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.05		<1 ppm		
		SAND - Dark grey fine to medium grained sand, moist		D,PID	0.25		<1 ppm		
		Moisture content increasing with depth						▼	
		From 0.4m, light brown/grey		D,PID	0.5		<1 ppm		
	0.6	Pit discontinued at 0.6m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.45m

REMARKS: Demolished house? No building materials found

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.23 AHD
EASTING: 381347.4
NORTHING: 6366642
DIP/AZIMUTH: 90°/--

PIT No: 68
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.2	FILLING - Generally comprising orange subangular gravel (brick?) filling, some fine to medium grained sand, humid to moist		D,PID	0.05		<1 ppm		
		SAND - Dark grey fine to medium grained sand, moist		D,PID	0.25		<1 ppm		
		From 0.4m, light grey		D,PID	0.5		<1 ppm	▼	
1		From 0.9m, light yellow		D,PID	1.0		<1 ppm		1
1	1.2	Pit discontinued at 1.2m, limit of investigation							
0	2								2
-1	3								3
-2	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.5m

REMARKS: Test pit adjacent to concrete structure

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.10 AHD
EASTING: 381334.7
NORTHING: 6366533.6
DIP/AZIMUTH: 90°/--

PIT No: 69
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.15	TOPSOIL - Dark grey fine to medium grained sand topsoil, abundant rootlets, moist		D,PID	0.05		<1 ppm		
		SAND - Dark grey fine to medium grained sand, moist		D,PID	0.25		<1 ppm		
		From 0.3m/0.35m, light grey/brown		D,PID	0.5		<1 ppm		
	0.6	Pit discontinued at 0.6m, limit of investigation							
1									
0	2								
-1	3								
-2	4								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage observed from 0.6m

REMARKS: Former house

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.80 AHD
EASTING: 372304.5
NORTHING: 6366399.2
DIP/AZIMUTH: 90°/--

PIT No: 70
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0	FILLING - Generally comprising brown gravelly fine to medium grained sand filling with trace clay and rootlets, damp		D,PID	0.05		<1 ppm		
	0.15	SAND - Dark grey fine to medium grained sand, trace clay to 0.4m, moist to wet		D,PID	0.25		<1 ppm		
				D,PID	0.5		<1 ppm	▼	
		SAND - Light grey sand, saturated							
	1			D,PID	1.0		<1 ppm		1
	1.1	SAND - Light grey mottled orange, fine to medium grained sand, with some clay, saturated							
				D,PID	1.5		<1 ppm		
	1.7	Pit discontinued at 1.7m, limit of investigation							
0	2								2
-1	3								3
-2	4								4
-3									

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.13 AHD
EASTING: 381267.4
NORTHING: 6366195.4
DIP/AZIMUTH: 90°/--

PIT No: 71
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.2	FILLING - Generally comprising (soft to firm), dark grey-brown clay filling, trace orange mottling, fine to medium grained sand, abundant rootlets to 0.15m, M>Wp		D,PID,pp	0.05		<1 ppm, 40-60 kPa		
				D,PID,pp	0.25		<1 ppm, 70-90 kPa		
	0.4	CLAY - Firm, grey-brown clay with trace orange mottling and fine to medium grained sand, M>Wp							
		CLAY - Stiff, dark grey/grey mottled orange-red clay, M>Wp		D,PID,pp	0.5		<1 ppm, 100-150 kPa		
		From 0.6m, light grey mottled orange							
0	1			D,PID,pp	1.0		<1 ppm, 130-160 kPa		1
	1.2	CLAY - Soft, light grey clay with some fine to medium grained sand, M>Wp		D,PID,pp	1.3		<1 ppm, 20-40 kPa		
	1.4	SAND - Light grey fine to medium grained sand, saturated		D,PID	1.5		<1 ppm	▼	
	1.6	Pit discontinued at 1.6m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 1.4m

REMARKS: Adjacent to drainage line and grassed access track

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.04 AHD
EASTING: 381197.2
NORTHING: 6366159.1
DIP/AZIMUTH: 90°/--

PIT No: 72
PROJECT No: 49608.01
DATE: 10/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.2	FILLING - Generally comprising firm, dark grey-brown clay filling with trace orange mottling, fine to medium grained sand, coal gravel and fines, abundant rootlets to 0.15m, M>Wp		D,PID,pp	0.05		<1 ppm, 60-80 kPa		
				D,PID,pp	0.25		<1 ppm, 50-70 kPa		
	0.4	CLAY - Firm, grey-brown clay with trace orange mottling and fine to medium grained sand, M>Wp							
				D,PID,pp	0.5		<1 ppm, 140-170 kPa		
	0.6	CLAY - Stiff, light grey-grey mottled orange clay, M>Wp							
0	1	SANDY CLAY - Soft, light grey mottled orange fine to medium grained sandy clay, M>Wp		D,PID,pp	1.0		<1 ppm, 30 kPa		1
				D,PID	1.5		<1 ppm	▷	
	1.6	SANDY CLAY - Soft, grey, fine to medium grained sandy clay, trace shells, M>Wp		D,PID,pp	1.7		<1 ppm, 40 kPa		
	1.8	Pit discontinued at 1.8m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage at 1.5m

REMARKS: Adjacent to drainage line and grassed access track

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	⫧	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.10 AHD
EASTING: 380967.7
NORTHING: 6366215.7
DIP/AZIMUTH: 90°/--

PIT No: 73
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.15	TOPSOIL - Dark grey clay topsoil with some sand, abundant rootlets, M>Wp		D,PID	0.05		<1 ppm		
		CLAY - Firm, dark grey-brown clay, trace sand, M>Wp		D,PID,pp	0.25		<1 ppm, 90-110 kPa		
		From 0.4m, stiff, sand content decreasing		D,PID,pp	0.5		<1 ppm, 170-200 kPa		
	0.6	CLAY - Soft, light grey mottled orange clay, trace to some fine to medium grained sand, M>Wp		D,PID	1.0		<1 ppm	▼	
				D,PID,pp	1.5		<1 ppm, 30-40 kPa		
	1.6	Pit discontinued at 1.6m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from approximately 1.45m

REMARKS: Adjacent to river and unsealed road

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.57 AHD
EASTING: 381363.2
NORTHING: 6365958.6
DIP/AZIMUTH: 90°/--

PIT No: 74
PROJECT No: 49608.01
DATE: 8/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	TOPSOIL - Grey-brown clay topsoil, trace fine to medium grained sand, abundant rootlets, M>Wp		D,PID	0.05		<1 ppm		
		CLAY - Very stiff to hard, grey-brown clay, trace fine to medium grained sand, M>Wp		D,PID,pp	0.25		<1 ppm, 250-450 kPa		
				D,PID,pp	0.5		<1 ppm, 450-550 kPa		
		From 0.8m, trace orange mottling							
	1			D,PID	1.0		<1 ppm		1
	1.3	Pit discontinued at 1.3m, consistent soils (natural)							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Along river bank (drainage channel)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.16 AHD
EASTING: 381477.7
NORTHING: 6365881.2
DIP/AZIMUTH: 90°/--

PIT No: 75
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.15	FILLING - Generally comprising very soft dark grey fine to medium grained sandy clay filling, trace gravel, abundant rootlets to 0.15m, M>Wp		D,PID,pp	0.05		<1 ppm, <10 kPa		
		CLAY - Dark grey clay with some to trace sand, M>Wp From 0.15m to 0.3m, trace shells, very stiff		D,PID,pp	0.25		<1 ppm, <10 kPa		
				D,PID,pp	0.5		<1 ppm, 200-270 kPa		
	0.6	INDURATED SAND - Orange-brown fine to medium grained indurated sand, moist		D,PID	0.7		<1 ppm		
0	1.0	CLAY - Stiff, grey mottled orange clay, M>Wp From 1.2m, orange mottling decreasing		D,PID,pp	1.0		<1 ppm, 130-140 kPa	▼	1
	1.4	CLAY - Light grey clay with some sand, M>Wp		D,PID	1.5		<1 ppm		
-1	1.6	Pit discontinued at 1.6m, limit of investigation							2
-2									3
-3									4

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 1.4m

REMARKS: Adjacent to timber fence post stockpile and loose gravel road

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.99 AHD
EASTING: 381794.4
NORTHING: 6366248.7
DIP/AZIMUTH: 90°/--

PIT No: 76
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING - Generally comprising dark grey clay filling with trace to some gravel, coal gravel, abundant rootlets to 0.1m, M>Wp		D,PID	0.05		<1 ppm		
		CLAY - Very stiff, dark brown-grey clay, M>Wp		D,PID	0.25		<1 ppm		
				D,PID,pp	0.5		<1 ppm, 250-350 kPa		
	0.6	CLAY - Stiff, light grey mottled orange clay, trace fine to medium grained sand, M>Wp							
0	1			D,PID,pp	1.0		<1 ppm, 150-220 kPa		1
		From 1.2m, sand content increasing slightly, very soft							
				D,PID,pp	1.5		<1 ppm, <20 kPa	▷	
	1.7	Pit discontinued at 1.7m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage at 1.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.65 AHD
EASTING: 381702
NORTHING: 6366334.9
DIP/AZIMUTH: 90°/--

PIT No: 77
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.2	FILLING - Generally comprising dark grey clay filling with some fine to medium grained sand, gravel, coal gravel, M>Wp		D,PID	0.05		<1 ppm		
	0.35	FILLING - Generally comprising stiff dark grey mottled red-orange clay filling with trace to some coal gravel/fines, M>Wp		D,PID,pp	0.25		<1 ppm, 110-130 kPa		
		CLAY - Stiff, dark grey mottled orange clay, M>Wp		D,PID,pp	0.5		<1 ppm, 100-160 kPa	▼	
		Light grey mottled orange from 0.6m							
-1	1			D,PID	1.0		<1 ppm		1
		Stiff, light grey clay (no mottling) from 1.1m							
				D,PID,pp	1.5		<1 ppm, 150-170 kPa		
	1.6	Pit discontinued at 1.6m, limit of investigation							
-2	2								2
-3	3								3
-4	4								4

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.6m

REMARKS: Approx 100m south of bend in loose gravel road. Pit adjacent to loose gravel road and drainage channel

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.99 AHD
EASTING: 381788.3
NORTHING: 6366440.2
DIP/AZIMUTH: 90°/--

PIT No: 78
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
									5 10 15 20
		FILLING - Generally comprising grey fine to medium grained sandy clay filling, trace to some gravel, coal gravel, bricks, abundant rootlets to 0.2m, M>Wp		D,PID	0.05		<1 ppm		
				D,PID	0.25		<1 ppm		
	0.3	CLAY - Very stiff, dark brown mottled orange clay, trace rootlets, M>Wp		D,PID,pp	0.5		<1 ppm, 250-320 kPa		
		From 0.6m, light grey-brown mottled orange							
0	1			D,PID,pp	1.0		<1 ppm, 110-170 kPa		1
	1.2	CLAY - Soft, light grey clay with some fine to medium grained sand, M>Wp						▼	
				D,PID,pp	1.5		<1 ppm, 40 kPa		
	1.6	Pit discontinued at 1.6m, limit of investigation							
-1	2								2
-2	3								3
-3	4								4

RIG: 7.5 tonne excavator, 600mm GP bucket with teeth

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 1.3m

REMARKS: Adjacent to bend (loose gravel road)

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.02 AHD
EASTING: 381932.6
NORTHING: 6366675.9
DIP/AZIMUTH: 90°/--

PIT No: 79
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1		FILLING - Generally comprising very soft dark grey silty clay filling with some ash (possibly old asphalt) and orange subangular gravel (possibly roadbase), trace rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, <10 kPa		
		From 0.1m, stiff		pp	0.1		100-120 kPa		
				D,PID,pp	0.25		<1 ppm, 100-110 kPa		
	0.4								
		CLAY - Stiff, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 100-110 kPa		
	0.55								
		Pit discontinued at 0.55m, limit of investigation							
0	1								1
-1	2								2
-2	3								3
-3	4								4

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.59 AHD
EASTING: 382224.5
NORTHING: 6366656.5
DIP/AZIMUTH: 90°/--

PIT No: 80
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.2	FILLING - Generally comprising very soft dark grey clayey silt filling with some sand, trace subangular gravel, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 10-20 kPa		
		From 0.1m, trace rootlets		D,PID,pp	0.25		<1 ppm, 110-130 kPa		
	0.5	CLAY - Stiff, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 80-90 kPa		
		From 0.35m, firm							
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.56 AHD
EASTING: 382508.4
NORTHING: 6366456.5
DIP/AZIMUTH: 90°/--

PIT No: 81
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.05	FILLING - Generally comprising dark grey clayey silt filling with some sand, trace ash and rootlets, M>Wp		D,PID	0.03		<1 ppm		
				D,PID	0.1		<1 ppm		
	0.15	FILLING - Generally comprising dark grey subangular gravel (ash) filling, trace rootlets		D,PID	0.2		<1 ppm		
	0.4	FILLING - Generally comprising orange subangular gravel filling with some sandstone fragments, medium to coarse grained sand, trace clay, moist		D,PID,pp	0.45		<1 ppm, 90-110 kPa		
	0.55	CLAY - Firm to stiff, grey mottled orange clay with some silt, trace fine to medium grained sand, M>Wp							
		Pit discontinued at 0.55m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.48 AHD
EASTING: 382923.2
NORTHING: 6366663.8
DIP/AZIMUTH: 90°/--

PIT No: 82
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.2	FILLING - Generally comprising very soft to soft, dark grey silty clay filling, trace fine to medium grained sand, M>Wp		D,PID,pp	0.05		<1 ppm, 10-50 kPa		
		SILTY CLAY - Soft, dark grey mottled orange silty clay, trace rootlets, M>Wp From 0.35m, firm to stiff		D,PID,pp	0.25		<1 ppm, 40-50 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation		D,PID,pp	0.45		<1 ppm, 80-130 kPa		

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Pit located in road / track platform, 0.2m above surrounding ground level

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.66 AHD
EASTING: 382259
NORTHING: 6366968.1
DIP/AZIMUTH: 90°/--

PIT No: 83
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0		SILTY CLAY - Very stiff, dark grey silty clay, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 10-20 kPa		
		From 0.1m, soft, trace rootlets		D,PID,pp	0.25		<1 ppm, 30-50 kPa		
				D,PID,pp	0.45		<1 ppm, 30-50 kPa	▼	
	0.5	Pit discontinued at 0.5m, limit of investigation							
-1	1								1
-2	2								2
-3	3								3
-4	4								4

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.66 AHD
EASTING: 382007
NORTHING: 6367086.9
DIP/AZIMUTH: 90°/--

PIT No: 84
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.0	CLAY - Very soft, dark grey clay with some fine to medium grained sand, M>Wp		D,PID	0.25		<10 ppm		
	0.3	SAND - Dark grey fine to medium grained sand, saturated		D,PID	0.5		~2 ppm	▼	
	0.6	SAND - Light grey fine to medium grained sand, saturated		D,PID	1.0		<1 ppm		
	1.2	Pit discontinued at 1.2m, due to collapse							

RIG: JCB 3CX 4WD Backhoe with 600mm mud bucket

LOGGED: Peade

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.5m

REMARKS: . Pit excavated adjacent to access track. Access track comprised. *300mm thick tyres filled with cobbles under loose roadbase gravel

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.63 AHD
EASTING: 380871.3
NORTHING: 6366407.3
DIP/AZIMUTH: 90°/--

PIT No: 85
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		CLAYEY SILT - Soft to firm, dark grey silty clay, trace fine grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 40-70 kPa		
		From 0.1m, firm, trace rootlets, sand content increasing with depth		D,PID,pp	0.25		<1 ppm, 60-90 kPa		
	0.4							▽	
	0.5	SILTY SAND - Dark grey silty fine grained sand with trace clay, saturated		D,PID	0.45		<1 ppm		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage encountered from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	⫧	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.13 AHD
EASTING: 381308.5
NORTHING: 6366652.4
DIP/AZIMUTH: 90°/--

PIT No: 86
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2	0.08	FILLING - Generally comprising dark grey clayey silt filling with ash, abundant rootlets, moist		D,PID	0.05		<1 ppm		
		FILLING - Generally comprising light grey mottled dark grey ash filling with trace to some silt, moist to wet		D,PID	0.25		<1 ppm	▼	
	0.5	SAND - Grey-brown fine to medium grained sand, trace silt, saturated		D,PID	0.55		<1 ppm		
	0.65	Pit discontinued at 0.65m, limit of investigation							
1	1								
0	2								
-1	3								
-2	4								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.45m

REMARKS: Pit moved 1m west to avoid concrete slab of tank

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.67 AHD
EASTING: 381622.2
NORTHING: 6366674.2
DIP/AZIMUTH: 90°/--

PIT No: 87
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.07	FILLING - Generally comprising grey-orange subangular gravel filling with some medium to coarse grained sand, trace subangular cobbles and clay, humid		D,PID	0.05		<1 ppm		
				D,PID	0.25		<1 ppm		
	0.4	FILLING - Generally comprising grey-orange subangular cobble filling with some subangular gravel, trace medium to coarse grained sand and clay, humid to damp At 0.08m, some tyres encountered At 0.2m, tyre encountered Pit discontinued at 0.4m, refusal on tyres							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Pit located in electricity easement fill platform, approximately 0.5m above surrounding ground level

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.54 AHD
EASTING: 382117
NORTHING: 6366352.2
DIP/AZIMUTH: 90°/--

PIT No: 88
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SILTY CLAY - (Possible filling?), firm, dark grey silty clay (filling?), trace medium to coarse grained sand, M>Wp		D,PID,pp	0.05		<1 ppm, 80-90 kPa	▼	
	0.5	SILTY CLAY - Firm, grey mottled orange silty clay, M>Wp From 0.3m, firm to stiff		D,PID,pp	0.25		<1 ppm, 60-80 kPa		
				D,PID,pp	0.45		<1 ppm, 70-110 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.1m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.91 AHD
EASTING: 382255
NORTHING: 6366244.1
DIP/AZIMUTH: 90°/--

PIT No: 89
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY SAND - Dark grey silty fine to medium grained sand, abundant rootlets, wet to saturated		D,PID	0.05		<1 ppm		
		From 0.1m, trace rootlets		D,PID	0.25		<1 ppm	▼	
		From 0.3m, saturated							
	0.4	SILTY CLAY - Firm to stiff, grey mottled orange silty clay, trace fine to medium grained sand, M>Wp		D,PID,pp	0.45		<1 ppm, 80-130 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.77 AHD
EASTING: 381906.3
NORTHING: 6366678.9
DIP/AZIMUTH: 90°/--

PIT No: 90
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	SILT AND ORGANIC MATTER - Grey-brown silt and organic matter (decaying reeds), saturated		D,PID	0.05		<1 ppm	▼	
	0.35	SILTY CLAY - Soft to firm, dark grey silty clay with some organic matter (decaying reeds and rootlets), trace medium to coarse grained sand, M>Wp		D,PID,pp	0.25		<1 ppm, 40-80 kPa		
	0.5	CLAY - Soft to firm, grey mottled orange clay with some silt and rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 30-60 kPa		
		Pit discontinued at 0.5m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Surface water approximately 0.1m above surrounding ground level

REMARKS: First attempt in shed-concrete floor

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382246.1
NORTHING: 6366626.1
DIP/AZIMUTH: 90°/--

PIT No: 91
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0		FILLING - Generally comprising very soft, dark grey silty clay filling with some subangular gravel and sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, <10 kPa		
		From 0.1m, some rootlets		D,PID,pp	0.25		<1 ppm, <10 kPa	▼	
	0.4	CLAY - Soft, grey mottled orange clay, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 40-50 kPa		
	0.55	Pit discontinued at 0.55m, limit of investigation							
-1	1								
-2	2								
-3	3								
-4	4								

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.57 AHD
EASTING: 382352.4
NORTHING: 6366486.2
DIP/AZIMUTH: 90°/--

PIT No: 92
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.4	FILLING - Generally comprising dark grey silty clay / clayey silt filling with trace fine to medium grained sand, brick fragments and subangular to subrounded gravel, abundant rootlets, M>Wp From 0.05m, trace rootlets		D,PID,pp	0.05		<1 ppm, 30-50 kPa		
				D,PID,pp	0.25		<1 ppm, 30-50 kPa		
	0.5	CLAY - Grey mottled orange clay, trace silt, fine grained sand and rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 70-100 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.39 AHD
EASTING: 382460.6
NORTHING: 6366665.2
DIP/AZIMUTH: 90°/--

PIT No: 93
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.2	FILLING - Generally comprising (very soft) silty clay / clayey silt, filling with trace subangular gravel, fine to medium grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, <10 kPa	▼	
		From 0.1m, trace to some rootlets		D,PID,pp	0.25		<1 ppm, 40-50 kPa		
	0.5	CLAY - Soft, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 50-70 kPa		
		From 0.35m, firm							
		Pit discontinued at 0.5m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.05m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.70 AHD
EASTING: 382463.7
NORTHING: 6366511.9
DIP/AZIMUTH: 90°/--

PIT No: 94
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILLING - Generally comprising dark grey clayey silty fine to coarse grained sand filling with some subangular gravel, abundant rootlets, moist to wet		D,PID	0.05		<1 ppm		
				D,PID	0.25		<1 ppm	▼	
	0.3	FILLING - Generally comprising orange subrounded to subangular gravel filling with some medium to coarse grained sand (possibly roadbase), trace clay, wet to saturated		D,PID	0.45		<1 ppm		
	0.5	SAND - Grey, fine to medium grained sand, saturated, slight hydrocarbon odour							
		Pit discontinued at 0.5m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.66 AHD
EASTING: 382522.2
NORTHING: 6366495.3
DIP/AZIMUTH: 90°/--

PIT No: 95
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	FILLING - Generally comprising (soft to firm), dark grey clayey silt filling with some fine to medium grained sand and organic matter (rootlets and decaying tree leaves), trace subrounded to subangular gravel, moist		D,PID,pp	0.05		<1 ppm, 30-70 kPa		
	0.2	FILLING - Generally comprising grey-orange subrounded to subangular cobbles and gravel filling with some sand, trace clay, moist		D,PID	0.25		<1 ppm	▼	
	0.5	SAND - Grey fine to medium grained sand, wet From 0.3m, saturated		D,PID	0.45		<1 ppm		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.41 AHD
EASTING: 383047.4
NORTHING: 6366611.2
DIP/AZIMUTH: 90°/--

PIT No: 96
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.3	CLAYEY SILT / SILTY CLAY - Very soft, dark grey clayey silt / silty clay, trace fine grained sand, abundant rootlets From 0.1m, trace rootlets		D,PID,pp	0.05		<1 ppm, <10 kPa		
				D,PID,pp	0.25		<1 ppm, <10 kPa		
	0.5	CLAY - Firm to stiff, grey mottled orange clay, trace silt, fine grained sand and rootlets, M>wp Sand content increasing with depth From 0.4m, some sand		D,PID,pp	0.45		<1 ppm, 80-110 kPa	▼	
		Pit discontinued at 0.5m, limit of investigation							

5 10 15 20

1 2 3 4

-1 -2 -3 -4

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.28 AHD
EASTING: 382784
NORTHING: 6366707.3
DIP/AZIMUTH: 90°/--

PIT No: 97
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.15	SILTY CLAY - Soft, dark grey mottled orange silty clay, some rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 30-40 kPa	▼	
		Silt content decreasing with depth		D,PID,pp	0.25		<1 ppm, 30-60 kPa		
		From 0.1m depth, trace rootlets							
	0.5	CLAY - Soft to firm, grey mottled orange clay, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 30-60 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Surface water approximately 0.1m deep

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.44 AHD
EASTING: 382555.5
NORTHING: 6366876.8
DIP/AZIMUTH: 90°/--

PIT No: 98
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.2	SILTY CLAY - Very soft, dark grey silty clay, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, <10 kPa	▼	
	0.5	CLAY - Soft, grey mottled orange clay with trace to some silt, trace rootlets, M>Wp		D,PID,pp	0.25		<1 ppm, 30-40 kPa		
				D,PID,pp	0.45		<1 ppm, 30-40 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.05m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.56 AHD
EASTING: 382728.2
NORTHING: 6367009.8
DIP/AZIMUTH: 90°/--

PIT No: 99
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.3	CLAYEY SILT - Very soft, dark grey clayey silt, trace fine to medium grained sand, abundant rootlets, M>Wp From 0.1m, soft, trace rootlets		D,PID,pp	0.05		<1 ppm, 10-20 kPa		
				D,PID,pp	0.25		<1 ppm, 30-50 kPa		
	0.5	CLAY - Firm, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 80-100 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.61 AHD
EASTING: 382314.7
NORTHING: 6366774.1
DIP/AZIMUTH: 90°/--

PIT No: 100
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY CLAY - Soft, dark grey silty clay, abundant rootlets		D,PID,pp	0.05		<1 ppm, 30-40 kPa	▽	
	0.2	CLAY - Firm, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.25		<1 ppm, 70-80 kPa		
				D,PID,pp	0.45		<1 ppm, 80-100 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

5 10 15 20

0 1 -1 2 -2 3 -3 4 -4

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0m to 0.2m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.65 AHD
EASTING: 382145.8
NORTHING: 6366794.1
DIP/AZIMUTH: 90°/--

PIT No: 101
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SILTY CLAY / CLAYEY SILT - Soft, dark grey silty clay / clayey silt, trace fine grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 30-50 kPa	▼	
		CLAY - Soft, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.25		<1 ppm, 40-50 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation		D,PID,pp	0.5		<1 ppm, 40-50 kPa		

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.12m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.42 AHD
EASTING: 382724.1
NORTHING: 6366487.2
DIP/AZIMUTH: 90°/--

PIT No: 102
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.08	SILTY CLAY / CLAYEY SILT - Soft, dark grey silty clay / clayey silt, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 30-50 kPa	▼	
		CLAY - Firm, grey mottled orange clay with some silt, trace rootlets, M>Wp		D,PID,pp	0.25		<1 ppm, 70-80 kPa		
	0.4	CLAYEY SILTY SAND - Grey clayey silty sand, saturated		D,PID	0.45		<1 ppm		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.2m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.73 AHD
EASTING: 382786.5
NORTHING: 6366333
DIP/AZIMUTH: 90°/--

PIT No: 103
PROJECT No: 49608.01
DATE: 5/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.15	SILTY CLAY - Very soft to soft, dark grey silty clay, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 20-30 kPa		
	0.35	CLAY - Firm, grey mottled orange clay, trace silt with rootlets, M>Wp		D,PID,pp	0.25		<1 ppm, 60-80 kPa		
	0.5	CLAYEY SAND - Grey mottled orange clayey fine to medium grained sand, wet		D,PID	0.45		<1 ppm	▽	
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.54 AHD
EASTING: 382634.2
NORTHING: 6366172.8
DIP/AZIMUTH: 90°/--

PIT No: 104
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.3	SILTY CLAY - Very soft to soft, dark grey silty clay, trace fine grained sand, abundant rootlets, M>Wp From 0.1m, soft, trace rootlets From 0.2m, soft to firm		D,PID,pp pp D,PID,pp pp	0.05 0.1 0.25 0.3		<1 ppm, 20-50 kPa 60 kPa <1 ppm, 90-120 kPa 100-120 kPa	▽	
-1	0.5	CLAY - Firm, grey clay with some silt, trace fine grained sand and rootlets, M>Wp From 0.4m, soft		D,PID,pp	0.45		<1 ppm, 60-90 kPa		
-2		Pit discontinued at 0.5m, limit of investigation							
-3									
-4									

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.88 AHD
EASTING: 382405.8
NORTHING: 6366188
DIP/AZIMUTH: 90°/--

PIT No: 105
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY CLAY - Stiff, dark grey silty clay with some rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 140-150 kPa		
		From 0.1m, trace rootlets		D,PID,pp	0.25		<1 ppm, 150-190 kPa		
	0.4								
		CLAY - Stiff to very stiff, grey mottled orange clay with some silt, trace fine to medium grained sand, M>Wp		D,PID,pp	0.45		<1 ppm, 160-210 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.46 AHD
EASTING: 382373.3
NORTHING: 6366392.6
DIP/AZIMUTH: 90°/--

PIT No: 106
PROJECT No: 49608.01
DATE: 9/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0	0.3	FILLING - Generally comprising very soft, dark grey silty clay filling with trace fine grained sand and subrounded to subangular cobbles (up to 90mm x 70mm), abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 10-20 kPa		
				pp	0.1		50-70 kPa		
				D,PID,pp	0.25		<1 ppm, 110-130 kPa		
		From 0.1m, firm, trace rootlets							
		From 0.15m, stiff, possibly natural, no cobbles		D,PID,pp	0.45		<1 ppm, 110-130 kPa	▽	
	0.5	CLAY - Stiff, grey mottled orange clay, trace rootlets, M>Wp		D,PID,pp	0.55		<1 ppm, 60-80 kPa		
	0.6	SANDY CLAY - Firm, grey, fine to medium grained sandy clay, M>Wp							
		Pit discontinued at 0.6m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.5m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.70 AHD
EASTING: 381965.2
NORTHING: 6366388.9
DIP/AZIMUTH: 90°/--

PIT No: 107
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
0.7	0.0	SILTY CLAY - Soft, dark grey silty clay with some rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 30-50 kPa		
		From 0.1m, firm to stiff		D,PID,pp	0.25		<1 ppm, 90-120 kPa		
0.4	0.3	CLAY - Firm to stiff, grey mottled orange clay with trace silt, M>Wp		D,PID,pp	0.45		<1 ppm, 80-110 kPa		
0.2	0.5	CLAYEY SAND - Grey clayey fine to medium grained sand, saturated						▽	
0.15	0.55	Pit discontinued at 0.55m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.55m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.61 AHD
EASTING: 381926.3
NORTHING: 6366234.6
DIP/AZIMUTH: 90°/--

PIT No: 108
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SILTY CLAY - Soft, dark grey silty clay, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 40-50 kPa		
	0.5	CLAY - Firm, grey mottled orange clay with trace silt, M>Wp From 0.35m, stiff		D,PID,pp	0.25		<1 ppm, 60-90 kPa		
				D,PID,pp	0.45		<1 ppm, 100-140 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.82 AHD
EASTING: 381947.3
NORTHING: 6366029
DIP/AZIMUTH: 90°/--

PIT No: 109
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY CLAY / CLAYEY SILT - Stiff, dark grey silty clay / clayey silt with some fine to medium grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 100-120 kPa		
		From 0.1m, trace rootlets		D,PID,pp	0.25		<1 ppm, 100-120 kPa		
	0.4								
	0.5	CLAY - Firm, grey mottled orange clay with some silt, trace fine to medium grained sand, M>Wp		D,PID,pp	0.45		<1 ppm, 80-100 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.77 AHD
EASTING: 381651.3
NORTHING: 6365913.4
DIP/AZIMUTH: 90°/--

PIT No: 110
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		CLAYEY SILTY SAND - Dark grey clayey silty fine grained sand, abundant rootlets, wet		D,PID	0.05		<1 ppm	▼	
		From 0.07m, trace rootlets							
		From 0.12m, saturated		D,PID	0.25		<1 ppm		
	0.4	SILTY CLAY - Firm to stiff, dark grey silty clay, M>Wp		D,PID,pp	0.45		<1 ppm, 90-110 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.12m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics I Environment I Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.95 AHD
EASTING: 381608.7
NORTHING: 6366431.6
DIP/AZIMUTH: 90°/--

PIT No: 111
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY CLAY - Firm, dark grey silty clay with trace fine grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 60-90 kPa		
		From 0.1m, some rootlets		D,PID,pp	0.25		<1 ppm, 60-100 kPa		
	0.4								
		CLAY - Stiff, grey mottled orange clay with some silt, M>Wp		D,PID,pp	0.45		<1 ppm, 110-140 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.94 AHD
EASTING: 381857.4
NORTHING: 6366559.3
DIP/AZIMUTH: 90°/--

PIT No: 112
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILLING - Generally comprising dark grey silty clay filling with some subangular gravel, trace medium to coarse grained sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 50-60 kPa		
		From 0.1m, trace rootlets		D,PID,pp	0.25		<1 ppm, 50-80 kPa	▼	
	0.4	SILTY CLAY - Dark grey silty clay with trace fine grained sand, M>Wp		D,PID,pp	0.4		<1 ppm, 50-70 kPa		
	0.65	Pit discontinued at 0.65m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RL: 0, -1, -2, -3, -4
Depth (m): 1, 2, 3, 4

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.3m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.90 AHD
EASTING: 381710.5
NORTHING: 6366754.6
DIP/AZIMUTH: 90°/--

PIT No: 113
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILLING - Generally comprising brown organic matter filling (decaying reeds) with some medium to coarse grained sand, trace gravel and clay (slope wash from electricity easement fill platform), saturated		D,PID	0.05		<1 ppm	▼	
				D,PID	0.25		<1 ppm		
	0.4	CLAYEY SILT - Dark grey clayey silt with abundant organic matter (decaying reeds and rootlets), saturated		D,PID	0.45		<1 ppm		
	0.55	Pit discontinued at 0.55m, limit of investigation							

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Surface water observed from 0.05m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.75 AHD
EASTING: 381843.6
NORTHING: 6367040.3
DIP/AZIMUTH: 90°/--

PIT No: 114
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY SAND - Dark grey silty sand, abundant rootlets, moist to wet		D,PID	0.05		<1 ppm		
		From 0.15m, trace to some rootlets, slight hydrocarbon odour		D,PID	0.25		<1 ppm	▼	
				D,PID	0.45		<1 ppm		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.35m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.94 AHD
EASTING: 381946
NORTHING: 6367099.3
DIP/AZIMUTH: 90°/--

PIT No: 115
PROJECT No: 49608.01
DATE: 4/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SANDY SILT - Very soft, dark grey fine to medium grained sandy silt, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 0-10 kPa		
		Sand content increasing with depth		D,PID	0.25		<1 ppm	▼	
	0.5	SILTY SAND - Dark grey silty sand with some rootlets, wet, slight hydrocarbon odour		D,PID	0.5		<1 ppm		
		Pit discontinued at 0.5m, limit of investigation							

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.4m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.47 AHD
EASTING: 381042.9
NORTHING: 6366634.2
DIP/AZIMUTH: 90°/--

PIT No: 116
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.2	SAND - Grey-brown fine to medium grained sand with trace to some silt, trace rootlets, moist to wet		D,PID	0.05		<1 ppm		
		SAND - Grey, fine to medium grained sand, moist to wet		D,PID	0.25		<1 ppm		
	0.5			D,PID	0.45		<1 ppm	▼	
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.45m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 2.06 AHD
EASTING: 381101.9
NORTHING: 6366499.2
DIP/AZIMUTH: 90°/--

PIT No: 117
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2		SILTY SAND - Dark grey silty medium grained sand, abundant rootlets, wet		D,PID	0.05		<1 ppm		
				D,PID	0.25		<1 ppm	▼	
		Silt content decreasing with depth		D,PID	0.45		<1 ppm		
	0.5	Pit discontinued at 0.5m, limit of investigation							
1	1								1
0	2								2
-1	3								3
-2	4								4

RIG: Hand Tools

LOGGED: Prowse

SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Free groundwater observed from 0.25m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.94 AHD
EASTING: 381049.3
NORTHING: 6366310.1
DIP/AZIMUTH: 90°/--

PIT No: 118
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		CLAYEY SILT - Dark grey clayey silt, abundant organic matter, saturated		D,PID	0.05		<1 ppm	▽	
		From 0.15m, clay content increasing		D,PID	0.25		<1 ppm		
	0.3	SILTY CLAY - Firm, grey mottled orange silty clay, trace rootlets, M>Wp		D,PID,pp	0.45		<1 ppm, 60-90 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: Seepage from 0.1m

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 0.96 AHD
EASTING: 381448.1
NORTHING: 6366138.5
DIP/AZIMUTH: 90°/--

PIT No: 119
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		SILTY CLAY / CLAYEY SILT - Firm to stiff, dark grey silty clay / clayey silt, trace fine grained sand and rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 90-120 kPa		
		From 0.15m, stiff		D,PID,pp	0.25		<1 ppm, 150-160 kPa		
	0.4								
		CLAY - Stiff, grey mottled orange clay, trace silt and fine grained sand, M>Wp		D,PID,pp	0.45		<1 ppm, 110-140 kPa		
	0.5	Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: Northbank Enterprise Hub Pty Ltd
PROJECT: Stage 2 Contamination Assessment
LOCATION: Lot 1001, DP 1127780, 365 Tomago Road, Tomago

SURFACE LEVEL: 1.10 AHD
EASTING: 381284.5
NORTHING: 6366098.9
DIP/AZIMUTH: 90°/--

PIT No: 120
PROJECT No: 49608.01
DATE: 3/8/2011
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
1	0.0	CLAYEY SILT / SILTY CLAY - Firm, dark grey clayey silt / silty clay, trace sand, abundant rootlets, M>Wp		D,PID,pp	0.05		<1 ppm, 90 kPa		
		From 0.1m, trace rootlets		D,PID,pp	0.25		<1 ppm, 50-80 kPa		
	0.4								
	0.5	CLAY - Stiff, grey mottled orange clay with some silt, trace fine grained sand, M>Wp		D,PID,pp	0.45		<1 ppm, 110-160 kPa		
		Pit discontinued at 0.5m, limit of investigation							

RIG: Hand Tools
LOGGED: Prowse
SURVEY DATUM: MGA94 Zone 3

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Appendix B

Laboratory Test Results

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 59351

Client:

Douglas Partners Newcastle
Box 324 Hunter Region Mail Centre
Newcastle
NSW 2310

Attention: Matthew Blackert, Kyle Prowse

Sample log in details:

Your Reference:	**49608.01, Tomago**
No. of samples:	21 soils, 3 materials
Date samples received / completed instructions received	03/08/11 / 03/08/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	10/08/11 / 9/08/11
Date of Preliminary Report:	Not issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Giovanni Agosti
Technical Manager

Tania Notaras
Manager

Lulu Guo
Approved Signatory

Jeremy Faircloth
Chemist

ACCREDITED FOR TECHNICAL COMPETENCE

VOCs in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	59351-5 Bore9/0.1 29/07/2011 Soil	59351-10 Pit23/0.25 01/08/2011 Soil	59351-14 Pit33/1.3 01/08/2011 Soil	59351-15 Pit34/0.1 01/08/2011 Soil	59351-16 Pit35/0.25 01/08/2011 Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1	<1	<1
chloroform	mg/kg	<1	<1	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1	<1	<1
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
bromoform	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
styrene	mg/kg	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1

VOCs in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	59351-5 Bore9/0.1 29/07/2011 Soil	59351-10 Pit23/0.25 01/08/2011 Soil	59351-14 Pit33/1.3 01/08/2011 Soil	59351-15 Pit34/0.1 01/08/2011 Soil	59351-16 Pit35/0.25 01/08/2011 Soil
o-Xylene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Surrogate Dibromofluorometha	%	98	102	98	98	100
Surrogate aaa-Trifluorotoluene	%	91	75	81	84	88
Surrogate Toluene-d_8	%	100	103	98	99	103
Surrogate 4-Bromofluorobenzene	%	103	104	104	103	103

vTRH & BTEX in Soil						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	84	80	91	68

vTRH & BTEX in Soil						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	95	75	75	96

vTRH & BTEX in Soil						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	67	99	81	84	88

vTRH & BTEX in Soil			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	75

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	89	90	92	94	92

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	91	95	90	93	92

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	91	90	91	86	89

sTRH in Soil (C10-C36)			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100
Surrogate o-Terphenyl	%	90	89

PAHs in Soil						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	0.7	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	4.0	<0.1	0.4	<0.1	<0.1
Pyrene	mg/kg	4.1	<0.1	0.4	<0.1	<0.1
Benzo(a)anthracene	mg/kg	1.0	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	1.9	<0.1	0.6	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	0.6	<0.2	1.0	<0.2	<0.2
Benzo(a)pyrene	mg/kg	1.1	<0.05	0.53	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	1.1	<0.1	0.5	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	1	<0.1	0.5	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	84	118	120	119	129

PAHs in Soil						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	0.9	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	<0.1	1.9	<0.1
Pyrene	mg/kg	<0.1	0.1	<0.1	1.9	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Chrysene	mg/kg	<0.1	0.1	<0.1	1.5	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	1.5	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.68	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1

PAHs in Soil						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Surrogate p-Terphenyl-d_{14}	%	119	127	122	123	110

PAHs in Soil						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.4	0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	0.6	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.22	0.07	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	113	117	118	109	111

PAHs in Soil			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	05/08/2011	05/08/2011
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	115	113

Organochlorine Pesticides in soil						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	90	94	92	88

Organochlorine Pesticides in soil						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	89	89	89	90

Organochlorine Pesticides in soil						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	88	88	88	90

Organochlorine Pesticides in soil			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	89	91

Organophosphorus Pesticides						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	90	94	92	88

Organophosphorus Pesticides						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	89	89	89	90

Organophosphorus Pesticides						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	88	88	88	90

Organophosphorus Pesticides			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011
Diazinon	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	89	91

PCBs in Soil						
Our Reference:	UNITS	59351-1	59351-3	59351-4	59351-5	59351-6
Your Reference	----------	Bore3/0.1	Bore6/0.5	Bore8/0.1	Bore9/0.1	Bore10/0.5
Date Sampled	----------	29/07/2011	26/07/2011	26/07/2011	29/07/2011	28/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	90	94	92	88

PCBs in Soil						
Our Reference:	UNITS	59351-7	59351-8	59351-9	59351-10	59351-11
Your Reference	----------	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25	Pit23/1.4
Date Sampled	----------	28/07/2011	27/07/2011	27/07/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	89	89	89	90

PCBs in Soil						
Our Reference:	UNITS	59351-12	59351-13	59351-14	59351-15	59351-16
Your Reference	----------	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1	Pit35/0.25
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011	06/08/2011	06/08/2011	06/08/2011
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	88	88	88	90

PCBs in Soil			
Our Reference:	UNITS	59351-17	59351-24
Your Reference	----------	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	28/07/2011
Type of sample		Soil	Soil
Date extracted	-	04/08/2011	04/08/2011
Date analysed	-	06/08/2011	06/08/2011
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221*	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	89	91

Acid Extractable metals in soil						
Our Reference:	UNITS	59351-1	59351-2	59351-3	59351-4	59351-5
Your Reference	----------	Bore3/0.1	Bore5/0.25	Bore6/0.5	Bore8/0.1	Bore9/0.1
Date Sampled	----------	29/07/2011	27/07/2011	26/07/2011	26/07/2011	29/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	3	<1	2	4	16
Copper	mg/kg	7	3	4	9	22
Lead	mg/kg	8	2	5	22	24
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	<1	1	4	14
Zinc	mg/kg	36	19	64	86	260
Manganese	mg/kg	36	5	72	81	190
Cobalt	mg/kg	1	<1	<1	1	11
Tin	mg/kg	<1	<1	<1	<1	2
Phosphorus	mg/kg	[NA]	32	[NA]	[NA]	[NA]

Acid Extractable metals in soil						
Our Reference:	UNITS	59351-6	59351-7	59351-8	59351-9	59351-10
Your Reference	----------	Bore10/0.5	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25
Date Sampled	----------	28/07/2011	28/07/2011	27/07/2011	27/07/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Arsenic	mg/kg	<4	6	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	19	31	10	16	4
Copper	mg/kg	12	10	13	22	21
Lead	mg/kg	8	10	11	1,000	76
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	18	18	12	18	5
Zinc	mg/kg	40	34	44	470	89
Manganese	mg/kg	250	120	160	360	28
Cobalt	mg/kg	11	8	4	9	4
Tin	mg/kg	3	3	1	4	2

Acid Extractable metals in soil						
Our Reference:	UNITS	59351-11	59351-12	59351-13	59351-14	59351-15
Your Reference	----------	Pit23/1.4	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	04/08/2011	04/08/2011	04/08/2011	04/08/2011	04/08/2011
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	0.9	<0.5	<0.5
Chromium	mg/kg	<1	5	7	31	1
Copper	mg/kg	1	12	61	17	7
Lead	mg/kg	2	28	1,000	7	3
Mercury	mg/kg	<0.1	0.1	0.2	0.1	<0.1
Nickel	mg/kg	<1	5	9	8	8
Zinc	mg/kg	39	73	830	13	98
Manganese	mg/kg	3	76	200	18	12
Cobalt	mg/kg	<1	1	3	1	4
Tin	mg/kg	<1	2	7	1	<1
Phosphorus	mg/kg	[NA]	[NA]	380	[NA]	[NA]

Acid Extractable metals in soil				
Our Reference:	UNITS	59351-16	59351-17	59351-24
Your Reference	----------	Pit35/0.25	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	01/08/2011	28/07/2011
Type of sample		Soil	Soil	Soil
Date digested	-	04/08/2011	04/08/2011	04/08/2011
Date analysed	-	04/08/2011	04/08/2011	04/08/2011
Arsenic	mg/kg	<4	<4	6
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	1	3	29
Copper	mg/kg	3	<1	10
Lead	mg/kg	4	10	10
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	20
Zinc	mg/kg	210	32	33
Manganese	mg/kg	1	360	220
Cobalt	mg/kg	<1	2	11
Tin	mg/kg	<1	1	3

Miscellaneous Inorg - soil						
Our Reference:	UNITS	59351-2	59351-4	59351-5	59351-7	59351-13
Your Reference	----------	Bore5/0.25	Bore8/0.1	Bore9/0.1	Bore10/1.0	Pit32/0.1
Date Sampled	----------	27/07/2011	26/07/2011	29/07/2011	28/07/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
Date analysed	-	05/08/2011	05/08/2011	05/08/2011	05/08/2011	05/08/2011
pH 1:5 soil:water	pH Units	5.1	5.4	5.6	7.9	6.5
Electrical Conductivity 1:5 soil:water	µS/cm	61	76	88	170	52
Fluoride (1:5 soil:water)	mg/kg	11	9.4	3.5	[NA]	[NA]
Ammonia as N in soil	mg/kg	12	[NA]	[NA]	[NA]	1.4
TKN as N in soil	mg/kg	2,100	[NA]	[NA]	[NA]	640
NOx as N in soil	mg/kg	0.94	[NA]	[NA]	[NA]	<0.5

Moisture						
Our Reference:	UNITS	59351-1	59351-2	59351-3	59351-4	59351-5
Your Reference	----------	Bore3/0.1	Bore5/0.25	Bore6/0.5	Bore8/0.1	Bore9/0.1
Date Sampled	----------	29/07/2011	27/07/2011	26/07/2011	26/07/2011	29/07/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	4/08/2011	4/08/2011	4/08/2011	4/08/2011	4/08/2011
Date analysed	-	5/08/2011	5/08/2011	5/08/2011	5/08/2011	5/08/2011
Moisture	%	28	5.4	9.8	29	16

Moisture						
Our Reference:	UNITS	59351-6	59351-7	59351-8	59351-9	59351-10
Your Reference	----------	Bore10/0.5	Bore10/1.0	Bore11/0.25	Bore12/0.5	Pit23/0.25
Date Sampled	----------	28/07/2011	28/07/2011	27/07/2011	27/07/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	4/08/2011	4/08/2011	4/08/2011	4/08/2011	4/08/2011
Date analysed	-	5/08/2011	5/08/2011	5/08/2011	5/08/2011	5/08/2011
Moisture	%	11	23	24	15	32

Moisture						
Our Reference:	UNITS	59351-11	59351-12	59351-13	59351-14	59351-15
Your Reference	----------	Pit23/1.4	Pit24/0.1	Pit32/0.1	Pit33/1.3	Pit34/0.1
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	4/08/2011	4/08/2011	4/08/2011	4/08/2011	4/08/2011
Date analysed	-	5/08/2011	5/08/2011	5/08/2011	5/08/2011	5/08/2011
Moisture	%	8.1	33	7.3	48	29

Moisture				
Our Reference:	UNITS	59351-16	59351-17	59351-24
Your Reference	----------	Pit35/0.25	Pit64/0.1	ALPD4
Date Sampled	----------	01/08/2011	01/08/2011	28/07/2011
Type of sample		Soil	Soil	Soil
Date prepared	-	4/08/2011	5/08/2011	4/08/2011
Date analysed	-	5/08/2011	5/08/2011	5/08/2011
Moisture	%	11	4.1	23

Asbestos ID - soils					
Our Reference:	UNITS	59351-15	59351-21	59351-22	59351-23
Your Reference	----------	Pit34/0.1	F1	F2	F3
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	09/08/2011	09/08/2011	09/08/2011	09/08/2011
Sample mass tested	g	Approx 30g	Approx 30g	Approx 30g	Approx 30g
Sample Description	-	Soil Rocks	Sandy soil	Sandy soil	Sandy soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - materials				
Our Reference:	UNITS	59351-18	59351-19	59351-20
Your Reference	----------	Fibro1	Fibro2	Fibro3
Date Sampled	----------	01/08/2011	01/08/2011	01/08/2011
Type of sample		Soil	Soil	Soil
Date analysed	-	09/08/2011	09/08/2011	09/08/2011
Mass / Dimension of Sample	-	87x50x4mm	55x50x3mm	158x72x5mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected	Chrysotile asbestos detected

Method ID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 21st ED, 4500-H+.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 21st ED 2510 and Rayment & Higginson.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA 21st ED, 4500-F-C.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA 21st ED 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-062	TKN - determined colourimetrically based on APHA 21st ED 4500 Norg.
Inorg-055	Nitrate - determined colourimetrically based on EPA353.2 and APHA 21st ED NO3- F. Soils are analysed following a water extraction.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-15	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			05/08/2011	59351-15	05/08/2011 || 05/08/2011	LCS-3	05/08/2011
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Chloromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Vinyl Chloride	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Bromomethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Chloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,1-dichloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	87%
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
bromochloromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
chloroform	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	99%
2,2-dichloropropane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2-dichloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	87%
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	91%
1,1-dichloropropene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Cyclohexane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
carbon tetrachloride	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Benzene	mg/kg	0.2	Org-014	<0.2	59351-15	<0.2 || <0.2	[NR]	[NR]
dibromomethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2-dichloropropane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
trichloroethene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	90%
bromodichloromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	98%
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Toluene	mg/kg	0.5	Org-014	<0.5	59351-15	<0.5 || <0.5	[NR]	[NR]
1,3-dichloropropane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
dibromochloromethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	97%
1,2-dibromoethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
tetrachloroethene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	LCS-3	95%
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
chlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Ethylbenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
bromoform	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
m+p-xylene	mg/kg	2	Org-014	<2	59351-15	<2 || <2	[NR]	[NR]
styrene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
o-Xylene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
isopropylbenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
bromobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
n-propyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
2-chlorotoluene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
4-chlorotoluene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
tert-butyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
sec-butyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
4-isopropyl toluene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
n-butyl benzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
hexachlorobutadiene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	59351-15	<1 || <1	[NR]	[NR]
Surrogate Dibromofluorometha	%		Org-014	100	59351-15	98 || 98 || RPD: 0	LCS-3	101%
Surrogate aaa-Trifluorotoluene	%		Org-014	102	59351-15	84 || 90 || RPD: 7	LCS-3	111%
Surrogate Toluene-d_8	%		Org-014	101	59351-15	99 || 100 || RPD: 1	LCS-3	102%
Surrogate 4-Bromofluorobenzene	%		Org-014	104	59351-15	103 || 103 || RPD: 0	LCS-3	105%

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			06/08/2011	59351-4	06/08/2011 || 06/08/2011	LCS-3	06/08/2011
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	59351-4	<25 || <25	LCS-3	100%
Benzene	mg/kg	0.2	Org-016	<0.2	59351-4	<0.2 || <0.2	LCS-3	87%
Toluene	mg/kg	0.5	Org-016	<0.5	59351-4	<0.5 || <0.5	LCS-3	95%
Ethylbenzene	mg/kg	1	Org-016	<1	59351-4	<1 || <1	LCS-3	106%
m+p-xylene	mg/kg	2	Org-016	<2	59351-4	<2 || <2	LCS-3	107%
o-Xylene	mg/kg	1	Org-016	<1	59351-4	<1 || <1	LCS-3	102%
Surrogate aaa-Trifluorotoluene	%		Org-016	102	59351-4	80 || 94 || RPD: 16	LCS-3	103%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			05/08/2011	59351-4	05/08/2011 || 05/08/2011	LCS-3	05/08/2011
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	59351-4	<50 || <50	LCS-3	85%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	59351-4	<100 || <100	LCS-3	92%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	59351-4	<100 || <100	LCS-3	62%
Surrogate o-Terphenyl	%		Org-003	89	59351-4	92 || 91 || RPD: 1	LCS-3	86%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			05/08/2011	59351-4	05/08/2011 || 05/08/2011	LCS-3	05/08/2011
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	LCS-3	116%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	LCS-3	127%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.2 || 0.1 || RPD: 67	LCS-3	106%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.4 || 0.4 || RPD: 0	LCS-3	96%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.4 || 0.4 || RPD: 0	LCS-3	95%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.3 || 0.2 || RPD: 40	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.6 || 0.5 || RPD: 18	LCS-3	140%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	59351-4	1.0 || 0.8 || RPD: 22	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	59351-4	0.53 || 0.44 || RPD: 19	LCS-3	112%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.5 || 0.4 || RPD: 22	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	59351-4	0.5 || 0.4 || RPD: 22	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	118	59351-4	120 || 122 || RPD: 2	LCS-3	129%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			036/08/2011	59351-4	06/08/2011 || 06/08/2011	LCS-3	06/08/2011
HCB	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	103%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	102%
Heptachlor	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	98%
delta-BHC	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	95%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	98%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	105%
Dieldrin	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	95%
Endrin	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	102%
pp-DDD	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	108%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	LCS-3	84%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	86	59351-4	94 || 92 || RPD: 2	LCS-3	89%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			06/08/2011	59351-4	06/08/2011 || 06/08/2011	LCS-3	06/08/2011
Diazinon	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	LCS-3	91%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	LCS-3	88%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	59351-4	<0.1 || <0.1	LCS-3	91%
Surrogate TCLMX	%		Org-008	86	59351-4	94 || 92 || RPD: 2	LCS-3	85%
QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-3	04/08/2011
Date analysed	-			06/08/2011	59351-4	06/08/2011 || 06/08/2011	LCS-3	06/08/2011
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	LCS-3	112%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	59351-4	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	86	59351-4	94 || 92 || RPD: 2	LCS-3	85%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-1	04/08/2011
Date analysed	-			04/08/2011	59351-4	04/08/2011 || 04/08/2011	LCS-1	04/08/2011
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	59351-4	<4 || <4	LCS-1	98%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	59351-4	<0.5 || <0.5	LCS-1	101%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	4 || 4 || RPD: 0	LCS-1	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	9 || 9 || RPD: 0	LCS-1	105%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	22 || 19 || RPD: 15	LCS-1	100%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	59351-4	<0.1 || <0.1	LCS-1	109%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	4 || 4 || RPD: 0	LCS-1	102%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	86 || 76 || RPD: 12	LCS-1	101%
Manganese	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	81 || 73 || RPD: 10	LCS-1	107%
Cobalt	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	1 || <1	LCS-1	101%
Tin	mg/kg	1	Metals-020 ICP-AES	<1	59351-4	<1 || <1	LCS-1	100%
Phosphorus	mg/kg	10	Metals-020 ICP-AES	<10	[NT]	[NT]	LCS-1	93%

QUALITY CONTROL Miscellaneous Inorg - soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			[NT]	59351-2	05/08/2011 || 05/08/2011	LCS-1	05/08/2011
Date analysed	-			[NT]	59351-2	05/08/2011 || 05/08/2011	LCS-1	05/08/2011
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	59351-2	5.1 || 5.1 || RPD: 0	LCS-1	101%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	59351-2	61 || 57 || RPD: 7	LCS-1	100%
Fluoride (1:5 soil:water)	mg/kg	0.5	Inorg-026	<0.5	59351-2	11 || 11 || RPD: 0	LCS-1	106%
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	59351-2	12 || [N/T]	[NR]	[NR]
TKN as N in soil	mg/kg	10	Inorg-062	<10	59351-2	2100 || 2000 || RPD: 5	[NR]	[NR]
NOx as N in soil	mg/kg	0.5	Inorg-055	<0.5	59351-2	0.94 || [N/T]	[NR]	[NR]

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			4/08/2011
Date analysed	-			05/08/2011
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL Asbestos ID - materials	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	59351-5	04/08/2011
Date analysed	-	[NT]	[NT]	59351-5	05/08/2011
Dichlorodifluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	mg/kg	[NT]	[NT]	59351-5	66%
cis-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromochloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chloroform	mg/kg	[NT]	[NT]	59351-5	77%
2,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	mg/kg	[NT]	[NT]	59351-5	67%
1,1,1-trichloroethane	mg/kg	[NT]	[NT]	59351-5	68%
1,1-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
Cyclohexane	mg/kg	[NT]	[NT]	[NR]	[NR]
carbon tetrachloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
trichloroethene	mg/kg	[NT]	[NT]	59351-5	70%
bromodichloromethane	mg/kg	[NT]	[NT]	59351-5	76%
trans-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromochloromethane	mg/kg	[NT]	[NT]	59351-5	74%
1,2-dibromoethane	mg/kg	[NT]	[NT]	[NR]	[NR]
tetrachloroethene	mg/kg	[NT]	[NT]	59351-5	74%
1,1,1,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromoform	mg/kg	[NT]	[NT]	[NR]	[NR]
m+p-xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
styrene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
o-Xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
isopropylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
tert-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
sec-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
hexachlorobutadiene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluorometha	%	[NT]	[NT]	59351-5	100%
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	59351-5	89%
Surrogate Toluene-d_8	%	[NT]	[NT]	59351-5	102%
Surrogate 4-Bromofluorobenzene	%	[NT]	[NT]	59351-5	104%

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	06/08/2011 || 06/08/2011	59351-5	06/08/2011
vTRH C_6 - C_9	mg/kg	59351-15	<25 || <25	59351-5	71%
Benzene	mg/kg	59351-15	<0.2 || <0.2	59351-5	61%
Toluene	mg/kg	59351-15	<0.5 || <0.5	59351-5	66%
Ethylbenzene	mg/kg	59351-15	<1 || <1	59351-5	74%
m+p-xylene	mg/kg	59351-15	<2 || <2	59351-5	76%
o-Xylene	mg/kg	59351-15	<1 || <1	59351-5	87%
Surrogate aaa-Trifluorotoluene	%	59351-15	84 || 90 || RPD: 7	59351-5	78%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	05/08/2011 || 05/08/2011	59351-5	05/08/2011
TRH C_{10} - C_{14}	mg/kg	59351-15	<50 || <50	59351-5	90%
TRH C_{15} - C_{28}	mg/kg	59351-15	<100 || <100	59351-5	97%
TRH C_{29} - C_{36}	mg/kg	59351-15	<100 || <100	59351-5	82%
Surrogate o-Terphenyl	%	59351-15	86 || 89 || RPD: 3	59351-5	91%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	05/08/2011 || 05/08/2011	59351-5	05/08/2011
Naphthalene	mg/kg	59351-15	<0.1 || <0.1	59351-5	114%
Acenaphthylene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	59351-15	<0.1 || <0.1	59351-5	127%
Phenanthrene	mg/kg	59351-15	<0.1 || <0.1	59351-5	102%
Anthracene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	59351-15	<0.1 || <0.1	59351-5	96%
Pyrene	mg/kg	59351-15	<0.1 || <0.1	59351-5	95%
Benzo(a)anthracene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	59351-15	<0.1 || <0.1	59351-5	131%
Benzo(b+k)fluoranthene	mg/kg	59351-15	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	59351-15	<0.05 || <0.05	59351-5	122%
Indeno(1,2,3-c,d)pyrene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%	59351-15	109 || 109 || RPD: 0	59351-5	127%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	06/08/2011 || 06/08/2011	59351-5	06/08/2011
HCB	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	59351-15	<0.1 || <0.1	59351-5	108%
gamma-BHC	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	59351-15	<0.1 || <0.1	59351-5	105%
Heptachlor	mg/kg	59351-15	<0.1 || <0.1	59351-5	102%
delta-BHC	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	59351-15	<0.1 || <0.1	59351-5	101%
Heptachlor Epoxide	mg/kg	59351-15	<0.1 || <0.1	59351-5	104%
gamma-Chlordane	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	59351-15	<0.1 || <0.1	59351-5	109%
Dieldrin	mg/kg	59351-15	<0.1 || <0.1	59351-5	100%
Endrin	mg/kg	59351-15	<0.1 || <0.1	59351-5	104%
pp-DDD	mg/kg	59351-15	<0.1 || <0.1	59351-5	113%
Endosulfan II	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	59351-15	<0.1 || <0.1	59351-5	88%
Methoxychlor	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	59351-15	88 || 88 || RPD: 0	59351-5	90%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	06/08/2011 || 06/08/2011	59351-5	06/08/2011
Diazinon	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	59351-15	<0.1 || <0.1	59351-5	89%
Fenitrothion	mg/kg	59351-15	<0.1 || <0.1	59351-5	84%
Bromophos-ethyl	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	59351-15	<0.1 || <0.1	59351-5	90%
Surrogate TCLMX	%	59351-15	88 || 88 || RPD: 0	59351-5	88%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	06/08/2011 || 06/08/2011	59351-5	06/08/2011
Arochlor 1016	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221*	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	59351-15	<0.1 || <0.1	59351-5	115%
Arochlor 1260	mg/kg	59351-15	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	59351-15	88 || 88 || RPD: 0	59351-5	86%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Date analysed	-	59351-15	04/08/2011 || 04/08/2011	59351-5	04/08/2011
Arsenic	mg/kg	59351-15	<4 || <4	59351-5	100%
Cadmium	mg/kg	59351-15	<0.5 || <0.5	59351-5	98%
Chromium	mg/kg	59351-15	1 || 1 || RPD: 0	59351-5	107%
Copper	mg/kg	59351-15	7 || 8 || RPD: 13	59351-5	112%
Lead	mg/kg	59351-15	3 || 2 || RPD: 40	59351-5	99%
Mercury	mg/kg	59351-15	<0.1 || <0.1	59351-5	109%
Nickel	mg/kg	59351-15	8 || 10 || RPD: 22	59351-5	106%
Zinc	mg/kg	59351-15	98 || 78 || RPD: 23	59351-5	92%
Manganese	mg/kg	59351-15	12 || 16 || RPD: 29	59351-5	112%
Cobalt	mg/kg	59351-15	4 || 5 || RPD: 22	59351-5	101%
Tin	mg/kg	59351-15	<1 || <1	59351-5	95%
Phosphorus	mg/kg	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL Miscellaneous Inorg - soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	59351-2	05/08/2011 || 05/08/2011
Date analysed	-	59351-2	05/08/2011 || 05/08/2011
pH 1:5 soil:water	pH Units	59351-2	5.1 || 5.1 || RPD: 0
Electrical Conductivity 1:5 soil:water	µS/cm	59351-2	61 || 57 || RPD: 7
Fluoride (1:5 soil:water)	mg/kg	59351-2	11 || 11 || RPD: 0
Ammonia as N in soil	mg/kg	59351-2	12 || [N/T]
TKN as N in soil	mg/kg	59351-2	2100 || 2000 || RPD: 5
NOx as N in soil	mg/kg	59351-2	0.94 || [N/T]

Report Comments:

Asbestos ID was analysed by Approved Identifier: Lulu Guo
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

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CERTIFICATE OF ANALYSIS 59493

Client:

Douglas Partners Newcastle
Box 324 Hunter Region Mail Centre
Newcastle
NSW 2310

Attention: Matthew Blackert, Kyle Prowse

Sample log in details:

Your Reference:	**49608.01, Tomago**
No. of samples:	30 soils, 3 materials
Date samples received / completed instructions received	05/08/11 / 05/08/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	12/08/11 / 21/09/11
Date of Preliminary Report:	Not issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Nancy Zhang
Chemist

Nick Sarlamis
Inorganics Supervisor

Lulu Guo
Approved Signatory

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	59493-2	59493-4	59493-5	59493-6	59493-7
Your Reference	----------	Bore4/0.5	Bore14/0.25	Pit36/0.07	Pit38/0.5	Pit39/0.3
Date Sampled	----------	01/08/2011	03/08/2011	02/08/2011	02/08/2011	02/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	119	119	123	122	119

vTRH & BTEX in Soil						
Our Reference:	UNITS	59493-8	59493-9	59493-10	59493-12	59493-13
Your Reference	----------	Pit40/0.1	Pit41/0.25	Pit48/0.1	Pit52/0.25	Pit52/0.5
Date Sampled	----------	02/08/2011	02/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	130	122	127	118	120

vTRH & BTEX in Soil						
Our Reference:	UNITS	59493-14	59493-15	59493-16	59493-17	59493-18
Your Reference	----------	Pit53/0.1	Pit54/0.1	Pit61/0.25	Pit65/0.5	Pit85/0.05
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	02/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	121	123	117	112	111

vTRH & BTEX in Soil						
Our Reference:	UNITS	59493-19	59493-20	59493-21	59493-22	59493-23
Your Reference	----------	Pit86/0.25	Pit87/0.25	Pit113/0.45	Pit116/0.05	Pit117/0.25
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	09/08/2011	09/08/2011
vTRH C_6 - C_9	mg/kg	<25	<25	<50	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.4	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<1	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<2	<1	<1
m+p-xylene	mg/kg	<2	<2	<4	<2	<2
o-Xylene	mg/kg	<1	<1	<2	<1	<1
Surrogate aaa-Trifluorotoluene	%	113	125	96	120	119

vTRH & BTEX in Soil						
Our Reference:	UNITS	59493-24	59493-25	59493-26	59493-27	59493-28
Your Reference	----------	Pit118/0.05	Pit119/0.05	Pit120/0.25	MJW D2	ALP-D13
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	09/08/2011	09/08/2011	09/08/2011	09/08/2011	09/08/2011
vTRH C_6 - C_9	mg/kg	<50	<25	<25	<25	<25
Benzene	mg/kg	<0.4	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<1	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<2	<1	<1	<1	<1
m+p-xylene	mg/kg	<4	<2	<2	<2	<2
o-Xylene	mg/kg	<2	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	114	112	114	125

vTRH & BTEX in Soil		
Our Reference:	UNITS	59493-29
Your Reference	----------	KGP-D2
Date Sampled	----------	03/08/2011
Type of sample		Soil
Date extracted	-	08/08/2011
Date analysed	-	09/08/2011
vTRH C_6 - C_9	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	113

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59493-2	59493-4	59493-5	59493-6	59493-7
Your Reference	----------	Bore4/0.5	Bore14/0.25	Pit36/0.07	Pit38/0.5	Pit39/0.3
Date Sampled	----------	01/08/2011	03/08/2011	02/08/2011	02/08/2011	02/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	180
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	86	86	84	85	118

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59493-8	59493-9	59493-10	59493-12	59493-13
Your Reference	----------	Pit40/0.1	Pit41/0.25	Pit48/0.1	Pit52/0.25	Pit52/0.5
Date Sampled	----------	02/08/2011	02/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	87	88	88	90	86

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59493-14	59493-15	59493-16	59493-17	59493-18
Your Reference	----------	Pit53/0.1	Pit54/0.1	Pit61/0.25	Pit65/0.5	Pit85/0.05
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	02/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	8,800	120	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	3,500	<100	<100	<100
Surrogate o-Terphenyl	%	85	#	106	85	84

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59493-19	59493-20	59493-21	59493-22	59493-23
Your Reference	----------	Pit86/0.25	Pit87/0.25	Pit113/0.45	Pit116/0.05	Pit117/0.25
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<100	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<200	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<200	<100	270
Surrogate o-Terphenyl	%	80	85	89	87	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	59493-24	59493-25	59493-26	59493-27	59493-28
Your Reference	----------	Pit118/0.05	Pit119/0.05	Pit120/0.25	MJW D2	ALP-D13
Date Sampled	----------	03/08/2011	03/08/2011	03/08/2011	03/08/2011	03/08/2011
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
Date analysed	-	08/08/2011	08/08/2011	08/08/2011	08/08/2011	08/08/2011
$TRHC_{10}$ - C_{14}	mg/kg	<100	<50	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<200	<100	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<200	<100	<100	<100	<100
Surrogate o-Terphenyl	%	103	96	98	98	97

sTRH in Soil (C10-C36)		
Our Reference:	UNITS	59493-29
Your Reference	----------	KGP-D2
Date Sampled	----------	03/08/2011
Type of sample		Soil
Date extracted	-	08/08/2011
Date analysed	-	08/08/2011
$TRHC_{10}$ - C_{14}	mg/kg	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100
Surrogate o-Terphenyl	%	93