Douglas Partners
Geotechnics | Environment | Groundwater

Integrated Practical Solutions

Report on Groundwater Assessment

Proposed Resource Recovery & Recycling Centre
24 Davis Road, Wetherill Park

Prepared for
Bettergrow Pty Ltd

Project 85126.01
September 2016

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	85126.01	Document No.	R.001.Rev0
Document title	Report on Groundwater Assessment Proposed Resource Recovery & Recycling Centre		
Site address	24 Davis Road, Wetherill Park		
Report prepared for	Bettergrow Pty Ltd		
File name	85126.01.R.001.Rev0.GW		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Draft A	Nerilee Edwards	Michael J Thom	22 March 2016
Revision 0	Nerilee Edwards	Michael J Thom/ Fiona MacGregor	20 September 2016

Distribution of copies

Status	Electronic	Paper	Issued to
Draft A	1	0	RPS (Shaun Smith)
Revision 0	1	0	RPS (Shaun Smith)

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
Author		20 September 2016
Reviewer		20 September 2016

bsi. ISO 9001 Quality Management

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

Executive Summary

This report presents the results of a groundwater assessment undertaken for a proposed resource recovery & recycling centre at 24 Davis Road, Wetherill Park. This assessment was undertaken to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Greenspot Resource Recovery Centre (SSD 7401).

The specific SEARs are address in the following locations:

SEAR	Location in Report/ Comment
DPI Attachment A	
Groundwater Assessment	
The known or predicted highest groundwater table at the site.	Section 4.3, Table 4
Works likely to intercept, connect with or infiltrate the groundwater sources.	Section 8.1
Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.	No extraction proposed
Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used consistent and unique bore identifiers for all future reporting.	No bores requiring registration with DPI proposed at this stage.
A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).	Sections 3, 4.3, 6
Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.	Section 3.5, 4.3 and recommendations in Section 8.3
The predicted impacts of any final landform on the groundwater regime.	Section 8.1
The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	Sections 3.4.1, 3.5, 3.6, 5.2, 8
An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.	Sections 3.4, 4, 7
An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).	Sections 4, 7, 8

SEAR	Location in Report/ Comment
DPI Attachment A	
Measures proposed to protect groundwater quality, both in the short and long term.	Section 8.3
Measures for preventing groundwater pollution so that remediation is not required.	Section 8.3
Protective measures for any groundwater dependent ecosystems (GDEs).	No potential for impact identified
Proposed methods of the disposal of waste water and approval from the relevant authority.	No groundwater extraction to form waste water or disposal of waste water to groundwater proposed.
The results of any models or predictive tools used.	No applicable
Where potential impacts are identified…	No potential impacts identified
Groundwater Dependent Ecosystems	Discussed briefly in Section 3.5. No GDE relying on groundwater from the site identified
Watercourses, Wetlands and Riparian Land	Discussed briefly in Sections 3.6 and 5.2. No impacts predicted

Overall, it is considered that the proposed development poses a low risk of significantly impacting groundwater supply or quality. Specifically:

- **Beneficial Groundwater Use**
  Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site.

  Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and DPI registered bores do not show any current beneficial use in the area of the site.

  The proposed development is considered to have a negligible risk of impacting the quality or supply of groundwater at the site.

- **Groundwater Dependent Ecosystems**
  There are no high priority GDE within or near the site. The proposed development is not considered to present a potential risk to GDE.

- **Impacts on Bores and Natural Drainage Features**
  The proposed development is not considered to present a potential risk to bores or natural drainage features.

As with any activity, appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required, and will mitigate further the already low risk posed by the development on groundwater at the site.

Areas where liquid wastes or dangerous goods are to be handled should have appropriate containment measures to prevent leachate/ spillage from entering the ground. This will include, as a minimum, the proposed tipping pit in the Food Depackaging and Process Building. Containment

measures should include an impermeable liner (e.g. HDPE or a compacted clay layer), bunding and spillage/ overflow contingency measures.

Furthermore, the currently proposed excavation level for the tipping pit (in the order of 43 m AHD) will require appropriate design in consideration of it extending below the water table measured in the two previous wells located closest to the proposed pit. This may trigger the NSW Aquifer Interference Policy, administered by NOW. This design could include tanking or an appropriately drained system (if approved by NOW). Alternately the pit could be redesigned to reduce potential interaction with groundwater as discussed below.

If the pit is to be redesigned to reduce the potential for interference with groundwater, it is recommended that the excavation level (i.e. to the base of the sub-grade) be no lower than 44.5 m AHD, i.e. at least 0.5 m above the highest recorded groundwater level in the two former wells located closest to the pit (MW10 and MW11). It is considered that this would result in minimal interference of the pit with groundwater during normal conditions, although groundwater could potentially rise to the level of the pit during high rainfall events. As such an appropriate pressure relief system/ valve would need to be installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events. The pressure relief system would need to be designed to minimise the potential for leakage of leachate through the impermeable lining. Any water ingressing through this system would need to be managed and disposed of as potentially contaminated leachate.

If groundwater is encountered during construction of foundations for any of the proposed new structures it is expected to comprise water in the Bringelly Shale aquitard. The water would be expected to be of limited quantity, connectivity and of low quality with respect to potential for beneficial use. Standard construction and water management/ disposal methods are considered suitable for any water encountered under this scenario.

It is considered appropriate to construct monitoring wells into the upper weathered shale profile to obtain background groundwater quality for comparison purposes in the future. Monitoring at 6 monthly intervals over a period of two years would provide a good background dataset for the proposed development. If the monitoring identified significant variation in the groundwater quality, further monitoring should be undertaken to provide a better understanding of the background conditions and variability.

If a potentially contaminating substance is to be stored or used on the site in the future, further groundwater monitoring should be undertaken, if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater.

In the event of a leakage or spillage of leachate or other potentially contaminating liquid, assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and/ or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds.

Douglas Partners
Geotechnics | Environment | Groundwater

Table of Contents

Table of Contents

Report on Groundwater Assessment
Proposed Resource Recovery & Recycling Centre
24 Davis Road, Wetherill Park

1. Introduction

1.1 Background and Purpose

This report presents the results of a groundwater assessment undertaken for a proposed resource recovery & recycling centre at 24 Davis Road, Wetherill Park. The investigation was requested by Mr Neil Schembri of Bettergrow Pty Ltd dated 22 January 2016 and was undertaken in accordance with Douglas Partners' proposal SYD151689 Rev1 dated 19 January 2016.

This assessment was undertaken to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Greenspot Resource Recovery Centre (SSD 7401), specifically the report addresses the NSW Department of Primary Industries requirements from the document titled *Bettergrow Recycling Facility, Wetherill Park (SSD_7401) Request for input into the Secretary's Environmental Assessment Requirements*, dated 7/12/2015.

1.2 Site Identification and Summary Information

Site information is summarised below in Table 1, and a current site layout plan is provided in Appendix A.

Table 1: General Site Information

Item	Description
Site Address	24 Davis Road, Wetherill Park NSW
Lot and DP Number	Lot 18 Deposited Plan 249417
Local Government Authority	Fairfield City Council
County/Parish	Parish of St Luke and the County of Cumberland
Total Site Area	Approximately 20,028 m^2
Current Zoning	IN2, General Industrial under Fairfield LEP 2013
Site Owner	Mobil Oil Australia Pty Ltd
Proposed Site Lessee/Occupier	Bettergrow Pty Ltd
Current Site Use	Vacant
Previous Site Use(s) (URS 1012b, refer to Section 4.1)	<~1966 Possible pastoral uses ~1966-1978 Possible unknown industrial ~1978-2004: Asphalt batching plant >~2004: Vacant
Proposed Future Land Use	Resource Recovery and Recycling Centre
Adjacent Land Use	North: Sydney Water pipeline then Walder Park (within the Western Sydney Parkland) then Prospect Reservoir East: Light industrial units South Light industrial, including smash repair West: Scrap metal facility

1.3 SEARs Requirements

This report addresses the Sears Attachment 2, NSW Department of Primary Industries (DPI), Attachment A, Groundwater Assessment requirement. Locations of specific items within this report are provided in Table 2, below. In addition, this report has briefly commented on Groundwater Dependent Ecosystems and Watercourses, Wetlands and Riparian Land.

Table 2: SEARs Requirements

SEAR	Location in Report/ Comment
DPI Attachment A	
Groundwater Assessment	
The known or predicted highest groundwater table at the site.	Section 4.3, Table 4
Works likely to intercept, connect with or infiltrate the groundwater sources.	Section 8.1
Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.	No extraction proposed
Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used consistent and unique bore identifiers for all future reporting.	No bores requiring registration with DPI proposed at this stage.
A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).	Sections 3, 4.3, 6
Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.	Section 3.5, 4.3 and recommendations in Section 8.3
The predicted impacts of any final landform on the groundwater regime.	Section 8.1
The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	Sections 3.4.1, 3.5, 3.6, 5.2, 8
An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.	Sections 3.4, 4, 7
An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).	Sections 4, 7, 8
Measures proposed to protect groundwater quality, both in the short and long term.	Section 8.3

SEAR	Location in Report/ Comment
DPI Attachment A	
Measures for preventing groundwater pollution so that remediation is not required.	Section 8.3
Protective measures for any groundwater dependent ecosystems (GDEs).	No potential for impact identified
Proposed methods of the disposal of waste water and approval from the relevant authority.	No groundwater extraction to form waste water or disposal of waste water to groundwater proposed.
The results of any models or predictive tools used.	No applicable
Where potential impacts are identified…	No potential impacts identified
Groundwater Dependent Ecosystems	Discussed briefly in Section 3.5. No GDE relying on groundwater from the site identified
Watercourses, Wetlands and Riparian Land	Discussed briefly in Sections 3.6 and 5.2. No impacts predicted

2. Objectives and Scope of Work

The objectives for the assessment were to:

- Assess the geological and hydrogeological conditions and likely groundwater quality at the site and local area; and
- Assess the potential of the proposed development to impact groundwater or groundwater dependent ecosystems.

The scope of work included:

- Review of published mapping of regional topography, geology, soils and water bodies;
- Review readily available documents providing pertinent information on the regional geology and hydrogeology;
- Review groundwater bore registered with the NSW Department of Primary Industry, Office of Water);
- Review the applicable Water Sharing Plan, background document, and catchment status report(s);
- Review relevant, available previous reports;
- Inspection of the site and nearby down-gradient surface water bodies;
- Review supplied information on the proposed development;
- Assess the potential risks posed on groundwater and GDE from the proposed development; and
- Comment on contingency measures for the event that groundwater is intercepted, and appropriate measures to ensure that groundwater is not contaminated.

3. Regional Information

3.1 Regional Topography and Surface Water

A review of the local topographic mapping and watercourses was undertaken, and an extract with 2 m contour intervals is provided in Figure 1, below.

The site is located down-gradient of Prospect Reservoir, with Prospect Dam located approximately 600 m north of the site. The spillway from Prospect Reservoir releases water into Prospect Creek. Prospect Creek flows generally in a north-west to south-east direction, passing within approximately 700 m of the site to the east. Prospect Creek flows into the Georges River at Georges Hall.

An unnamed tributary of Prospect Creek flows generally in a west-south-west to east-north-east direction passing within approximately 450 m of the site to the south/ south east. Surface water from the site is expected to drain into this unnamed watercourse.

The site is located on the northern slopes of a small valley associated with this unnamed tributary. The site slopes generally down towards the south, with topographical mapping (refer to Figure 1) showing the landform at the site has been considerably modified. A local high is present to the east of the site, and the original site gradient may have naturally been slightly more westerly than currently exists.

Figure 1: Regional Topography (2m contours) and Watercourses (red pin shows site location)

3.2 Regional Geology

Regional geological mapping is shown in Figure 2, below.

Reference to the Penrith 1:100,000 Geological Series Sheet indicates that the site and surrounding area is generally underlain by Bringelly Shale of the Wianamatta Group. Bringelly Shale comprises Middle Triassic Shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff.

Sandstone constitutes about 20-30% of the Bringelly Shale though mainly in the top half of the formation. Sandstone beds are typically less than 2 m thick and rarely more than 6 m, with a few units persistent enough to rate definition as members (McNally, 2004[1]).

Maximum thicknesses quoted below have been sourced from the Geoscience Australia *Australian Stratigraphic Units Database*[2].

The Wianamatta Group (maximum thickness of 300 m), consists of three formations, from top to bottom, Bringelly Shale (maximum thickness of 257 m), Minchinbury Sandstone (in the order of 7 m thick[3]) and Ashfield Shale (maximum thickness of 62 m).

The Wianamatta Group is underlain by the Mittagong Formation and Hawkesbury Sandstone. The Mittagong Formation comprises interbedded shale, laminite and medium-grained quartz sandstone (maximum thickness 10 m). Hawkesbury Sandstone comprises Triassic age medium to coarse grained quartz sandstone with very minor shale and laminite lenses (maximum thickness of 290 m).

Quaternary Fluvial sediments comprising medium-grained sand, clay and silt are mapped in Prospect Creek and the unnamed tributary.

An outcrop of the igneous Prospect Picrite is present to the north east of the site.

[1] McNally, G 2004, 'Shale, Salinity And Groundwater In Western Sydney', Australian Geomechanics Vol 39 No 3, September 2004 pp107-122 (McNally, 2004)
[2] http://dbforms.ga.gov.au/pls/www/geodx.strat_units.int
[3] Lovering, J. F., 1954. The stratigraphy of the Wianamatta Group Triassic System, Sydney Basin. *Records of the Australian Museum* 23(4): 169–210, plate xii. [25 June 1954].

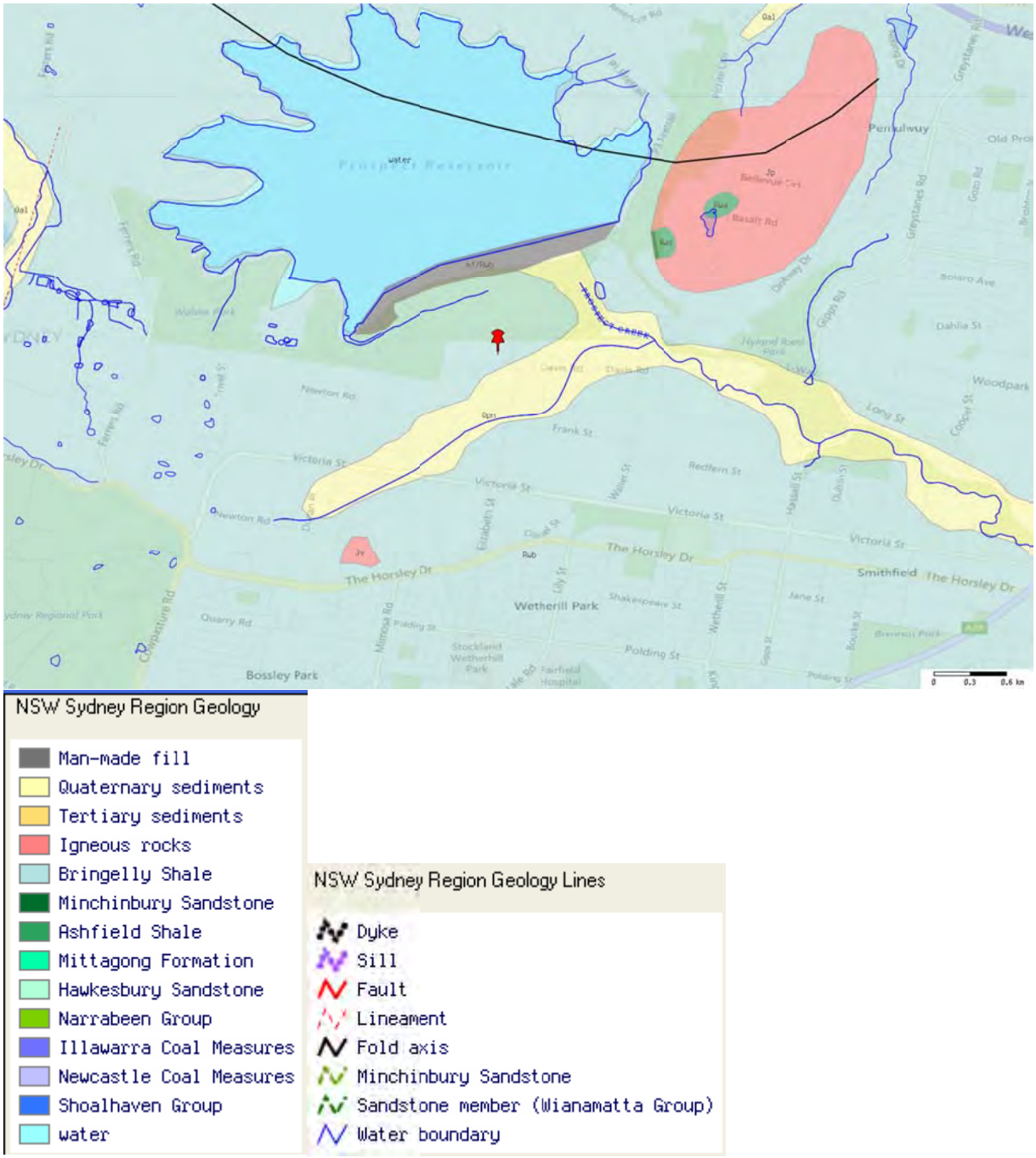


Figure 2: Regional Geology and Legend (red pin shows site location)

3.3 Soil Landscape Mapping

Reference to the Penrith 1:100,000 Soils Landscape Sheet indicates that the site is located within the Blacktown residual soil landscape area. The soil landscape is described as gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone. Local relief is to 30 m and slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes are typical. Limitations are given as moderately reactive highly plastic subsoil, low soil fertility, poor soil drainage.

The *Map of Salinity Potential in Western Sydney*, 2002 (NSW Department of Infrastructure, Planning and Natural Resources) indicates that the site has a moderate salinity potential.

3.4 Groundwater

3.4.1 Registered Groundwater Bore Database

A search was undertaken of registered groundwater bores in the NSW Department of Primary Industry (DPI), with the results summarised in Table 3 and Figure 3 below, and Work Summary Sheets for each bore are provided in Appendix B.

Twenty three bores were registered within 1 km of the site, four of which were within 500 m of the site. Twenty two of the bores were shallow (<10m depth) monitoring wells, with only limited data recorded.

The remaining bore, Bore No. GW109317, was a test bore drilled to 165 m located approximately 1 km north east (cross-gradient) of the site. It encountered four water bearing zones between 53 m and 164 m depth, all recorded as having a thickness of 0.1 m to 1 m and associated with fractured shale or sandstone bedrock. Yields were recorded between 0.45 L/s and 2.1 L/s and salinity was recorded between 6,000 mg/L and 10,000 mg/L.

The lack of active producing bores in the vicinity of the site is indicative of groundwater not being an economic resource in the area due to the high salinity of water from the Bringelly and Ashfield Shales.

Table 3: Summary of DPI Borehole Records

Bore No.	Location	Direction from site	Well Depth	Aquifer Depth	Standing Water Level	Yield	Salinity	Geology	Purpose
			m	m	m	L/sec	mg/L		
BORES WITHIN 500m OF SITE									
GW103822	153 NEWTOWN RD	SW	9	-	-	-	-	-	Monitoring
GW103823	153 NEWTOWN RD	SW	15	-	-	-	-	-	Monitoring
GW103824	153 NEWTOWN RD	SW	15	-	-	-	-	-	Monitoring
GW111392	29C DAVIS ROAD	E	6	-	-	-	-	clay & shale	Monitoring
BORES WITHIN 0.5-1km OF SITE									
GW105474	39-41 FRANK ST	SE	9.3	-	-	-	-	shale	Monitoring
GW105475	39-41 FRANK ST	SE	9.5	-	-	-	-	shale	Monitoring
GW105476	39-41 FRANK ST	SE	9.5	-	-	-	-		Monitoring
GW109317	LOT 2 HASSALL ST, BORAL RESOURCES	NE	165	53-54; 101.5-101.6; 127.1-127.2; 163.8-163.9	19	0.45; 0.15; 0.7; 2.1	6,050; 6,150; 10,000; 10,000	interbedded shale, siltstone & sandstone	Test bore, cancelled
GW110063	428-440 VICTORIA ST	S	5	-	-	-	-	clay & shale	Monitoring
GW110064	428-440 VICTORIA ST	S	1.1	-	-	-	-	fill	Monitoring
GW110065	428-440 VICTORIA ST	S	4.9	-	-	-	-	clay & shale	Monitoring
GW110066	428-440 VICTORIA ST	S	4.2	-	-	-	-	clay & shale	Monitoring
GW110067	428-440 VICTORIA ST	S	4.2	-	-	-	-	clay	Monitoring
GW110068	428-440 VICTORIA ST	S	5	-	-	-	-	clay & shale	Monitoring
GW110069	428-440 VICTORIA ST	S	3.9	-	-	-	-	clay & shale	Monitoring
GW110070	428-440 VICTORIA ST	S	5.1	-	-	-	-	clay & shale	Monitoring
GW110071	428-440 VICTORIA ST	S	5.1	-	-	-	-	clay & shale	Monitoring
GW110072	428-440 VICTORIA ST	S	4	-	-	-	-	clay & shale	Monitoring
GW111391	29C DAVIS ROAD	E	6	-	-	-	-	clay	Monitoring

Bore No.	Location	Direction from site	Well Depth	Aquifer Depth	Standing Water Level	Yield	Salinity	Geology	Purpose
			m	m	m	L/sec	mg/L		
GW111878	35 - 37 FRANK ST	SE	5.5	-	-	-	-	clay & shale	Monitoring
GW111879	35 - 37 FRANK ST	SE	5.8	-	-	-	-	clay & shale	Monitoring
GW111880	35 - 37 FRANK ST	SE	6.2	-	-	-	-	clay & shale	Monitoring
GW111881	35 - 37 FRANK ST	SE	6.5	-	-	-	-	clay & shale	Monitoring

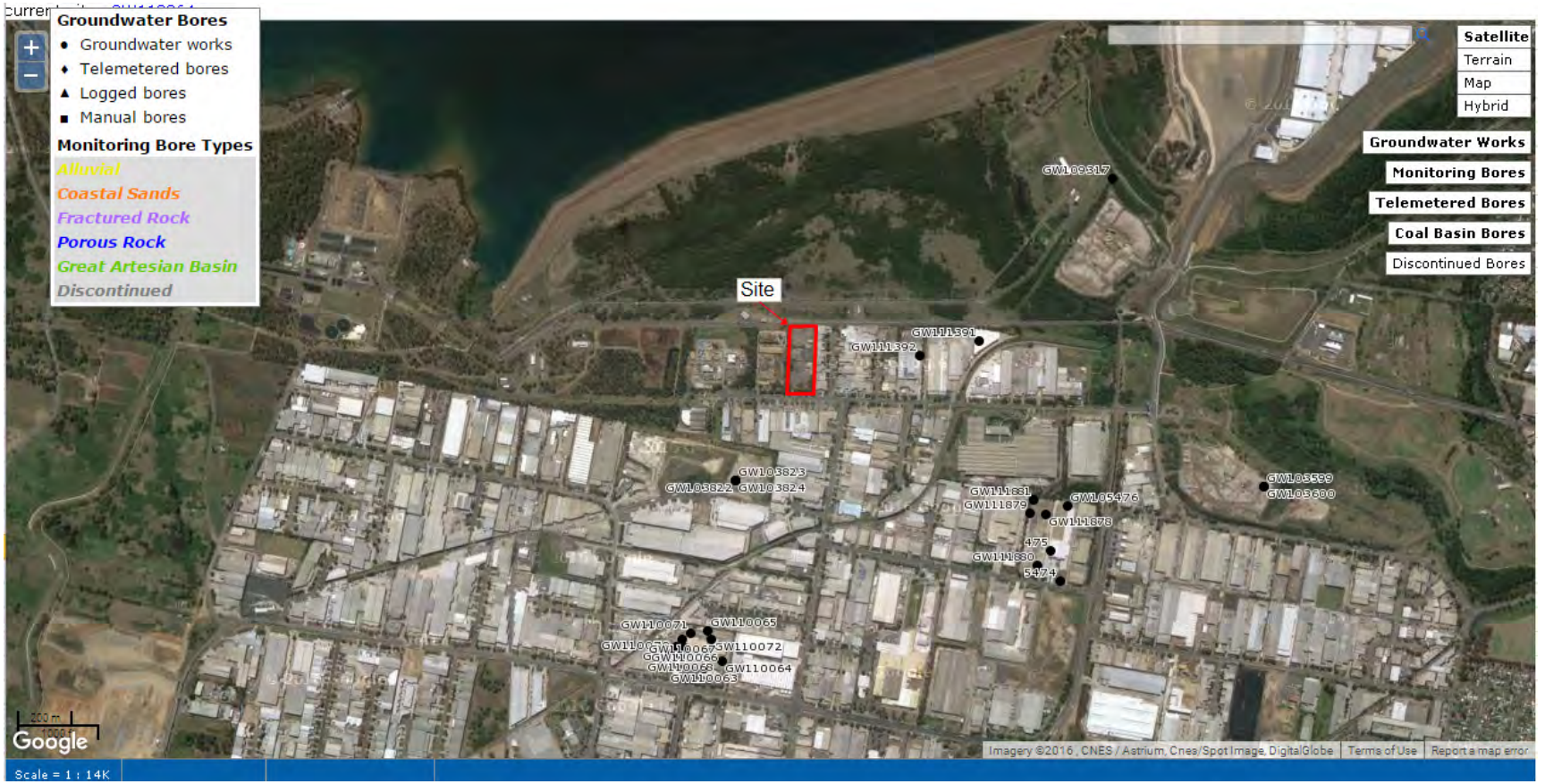


Figure 3: DPI Registered Bores

3.4.2 Formation Characteristics

Bringelly and Ashfield Shale are best considered as aquitards, due their generally low permeability and poor ability to support producing wells.

McNally (2004) provides a review of groundwater in the Wianamatta Group as it relates to salinity, and describes the Group as having two general water bearing horizons. The upper water bearing horizon being the regolith to typical depths of 3-10 m, comprises scattered zones of fracture porosity within the weathered shale and soil profile, with typical bulk hydraulic conductivity of 10^{-6} to 10^{-9} m/s. The lower second water bearing horizon is at depth in the unaltered shale bedrock with typical bulk hydraulic conductivity of 10^{-7} to 10^{-9} m/s.

McNally (2004) describes general characteristics of aquitards, such as the Wianamatta Group, as comprising:

- *Low, but variable, hydraulic conductivity….., very limited storage and low well yield – typically less than 1 L/s or 0.1 ML/day.*
- *The water-bearing fractures are impersistent, widely spaced and, in particular, poorly interconnected. These 'aquifers' can therefore be visualised as a complex of stacked and sporadically distributed ephemeral perched water tables rather than a single saturated zone, and it is questionable whether a continuous water table can be said to exist.*
- *Boreholes and piezometers may appear to be dry when first drilled, yet slowly fill with water over several weeks. Piezometer recovery time following bailing is very slow and SWLs [standing water levels] may fluctuate by a number of metres over many months (and up to 9 m over three drought years).*
- *SWLs in piezometers 100-200 m apart may differ by 1- 3 m on the same day and seasonal variations of 3- 4 m are possible. Nearby wells may differ greatly in salinity, say 7,000 to 21,000 mg/L within 50 m (and can also demonstrate large seasonal changes).*

McNally (2004) described the shallow regolith aquitard as being *made up of residual soil, colluvium, floodplain alluvium and weathered saprolite – all clays derived from the shale bedrock. It also includes, in places, lateritic mottled zones and ferricrete where these are developed on a shale parent rock. The regolith ranges in thickness from less than one metre on hill crests to 6-12 m on valley floors. The constituent deposits are largely very stiff to hard silty clays with varying proportions of shale fragments, pisolithic ironstone gravel, mottling and limonite staining, and are difficult to distinguish in boreholes. Colluvium merges into alluvium through downslope creep, and residual soils may develop either directly on the parent shale or on the colluvium/alluvium derived from it.*

The best aquifer in the region of the site is expected to be within the Hawkesbury Sandstone. This comprises a typically horizontally bedded sandstone formation, with variable hydraulic conductivity, which hosts a generally confined fractured rock aquifer. The majority of groundwater within the Hawkesbury Sandstone migrates through features such as fractures, joints, shears and bedding planes, however some intra-granular flow also occurs.

3.4.3 Groundwater Quality

Groundwater quality in the Wianamatta Group is general saline, with McNally (2004) reporting typical salinity values in the range 5,000-50,000 mg/L. Groundwater quality in the Bringelly Shale is typically not suitable for beneficial use for human or stock consumption or for irrigation.

Groundwater in the Hawkesbury Sandstone often has naturally elevated concentrations of iron and manganese, and is generally acidic with a pH varying between 4.5 and 6.5. Salinity levels are low, although the salinity of the upper part of the aquifer may be elevated due to flows from the overlying shales.

3.4.4 Water Sharing Plan

The site is located in the area subject to the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* (the WSP). The site is located within the Sydney Basin Central groundwater source covered by the WSP.

The WSP is informed by the NSW Office of Water (NOW) *Water Sharing Plan Greater Metropolitan Region Groundwater Sources Background document* (2011) (NOW, 2011).

NOW (2011) described the Sydney Basin Central groundwater source as a porous rock aquifer with low to moderate connectivity to surface waters and an estimated "travel time between groundwater and unregulated river" of years to decades.

The *Rules summary sheet for the Sydney Basin Central Groundwater Source (*July 2011) Rules for granting and amending water supply works approvals, includes "*To protect water quality: To minimise the impact on water quality from saline interception in the shale aquifers overlying Sydney basin sandstone, the bore being used to take groundwater must be constructed with pressure cement to seal off the shale aquifer as specified by the Minister*."

3.4.5 Groundwater Aquifer Conditions and Pressures

The Department of Environment, Climate Change and Water (DECCW) *State of the Catchments 2010: Sydney Metropolitan region: Groundwater* (2010) (DECCW, 2010) assigns the Sydney Basin–Central aquifer as poor to very poor for all indicators, including groundwater levels, quality and groundwater dependent ecosystems (GDE) condition, with an overall condition assessment of poor.

DECCW (2010) also assesses the "pressures" from potential impacts from human activity. The pressures on the Sydney Basin–Central aquifer have been assessed as ranging from very low to very high, with an overall pressure assessment of moderate. Assessments of very low and low were assigned for extraction rates and regional impacts; an assessment of moderate was made for localised impacts and groundwater quality impacts; and assessments of very high to high were made for GDE availability, land-use pressures and aquifer structure pressures.

DECCW (2010) identified the main pressure in the Sydney Basin–Central groundwater management area as being mining, with existing mining activities causing dewatering of the aquifer and permanent alteration of the aquifer matrix.

3.4.6 Groundwater Vulnerability

Groundwater vulnerability is defined in the Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council (ANZECC) *Guidelines for Groundwater Protection in Australia*, September 1995 (ANZECC, 1995) as a relative evaluation of the potential exposure of a groundwater resource and its beneficial use to contamination from planned and unplanned sources. The concept of vulnerability is based upon an assumption that the physical environment can provide some degree of protection from contamination through natural attenuation processes. The vulnerability assessment is a qualitative assessment based upon the hydrogeological regime, as well as the thickness and nature of the unsaturated zone overlying the aquifer. For example, a shallow unconfined aquifer with a permeable unsaturated zone would be highly vulnerable to surface contamination, whereas a deep confined aquifer would have a low vulnerability.

The groundwater resource most likely to be present beneath the site comprises a confined sandstone aquifer at depths of greater than 100 m (based on registered bore GW109317, refer to Section 3.4.1) overlain by the relatively low permeability aquitards of the Wianamatta Group. Whilst groundwater bearing zones may be present within fractures in the Wianamatta Group, the potential for significant impact on these is also considered to be limited by overlying low permeability horizons. On this basis the aquifer vulnerability in the area of the site is considered to be low.

3.4.7 Beneficial Groundwater Use

Based on above information it is considered that groundwater within the Wianamatta Shales in the region of the site is not subject to, or suitable for, beneficial use.

Registered bore GW109317 (refer to Section 3.4.1) recorded salinity in the Hawkesbury Sandstone at depths of 127 m and 164 m bgl in the region of the site of 10,000 mg/L, although this may have been impacted by leakage within the bore. The lack of production bores registered in the area indicates that water in Hawkesbury Sandstone in the region of the site is not subject to beneficial use, and may not be suitable for beneficial use without treatment.

3.5 Groundwater Dependent Ecosystems

NOW (2011) identifies high priority groundwater dependent ecosystems (GDE), and a drawing of the locations is provided as Figure 4, below. The nearest down-hydraulic gradient mapped GDE is over 10 km from the site.

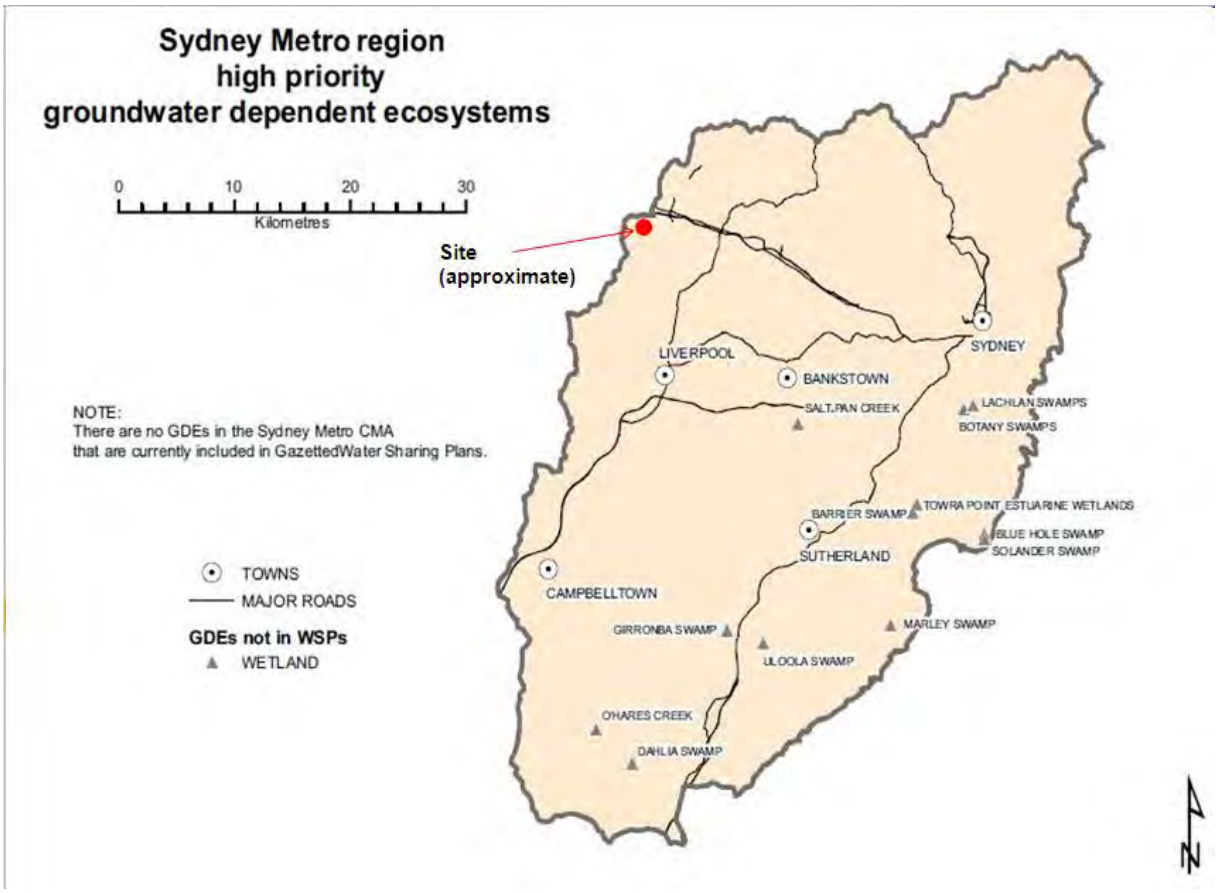


Figure 4: Sydney Metro Region High Priority GDE (from State of the Catchments, Groundwater Sydney Metropolitan region, 2010)

3.6 Fairfield LEP 2013

The pertinent information summarised below was obtained from the Fairfield Local Environmental Plan 2013 (the LEP) and associated mapping.

3.6.1 Zoning

The site, and the land to approximately 1 km down-gradient of the site, is zoned IN1 General Industrial. The objectives of the zone are:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To ensure development is not likely to detrimentally affect the viability of any nearby business centre.

3.6.2 Terrestrial Biodiversity

Clause 6.5 of the LEP covers terrestrial biodiversity, and includes the following:

(1) The objective of this clause is to maintain terrestrial biodiversity by:

(a) protecting native fauna and flora, and

(b) protecting the ecological processes necessary for their continued existence, and

(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

(2) This clause applies to land identified as "Biodiversity" on the *Terrestrial Biodiversity Map*.

The mapping shows that the closest area of mapped as "Biodiversity" is approximately 750 m cross gradient from the site. The closest down-gradient "Biodiversity" is over 1 km away, on the other side of the unnamed tributary of Prospect Creek.

3.6.3 Riparian land and watercourses

Clause 6.6 of the LEP covers Riparian land and watercourses, and includes the following:

(1) The objective of this clause is to protect and maintain the following:

(a) water quality within watercourses,

(b) the stability of the bed and banks of watercourses,

(c) aquatic and riparian habitats,

(d) ecological processes within watercourses and riparian areas.

(2) This clause applies to land identified as "Riparian area" on the *Riparian Lands and Watercourses Map*.

(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:

(a) whether or not the development is likely to have any adverse impact on the following:

(i) the water quality and flows within the watercourse,

(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,

(iii) the stability of the bed and banks of the watercourse,

(iv) the free passage of fish and other aquatic organisms within or along the watercourse,

(v) any future rehabilitation of the watercourse and riparian areas, and

(b) whether or not the development is likely to increase water extraction from the watercourse, and

(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided-the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised-the development will be managed to mitigate that impact.

The unnamed tributary of Prospect Creek is located approximately 400 m south and south east of the site, and is likely to be the receiver of surface water runoff from the site. The watercourse is mapped as "Riparian area" under the LEP.

4. Previous Reports

4.1 Previous Reports

The following previous reports were available for review:

- Dames and Moore, *Mobil Site Audit Assessment Form*, 1990 [only pages 1 and 2 and a sketch available for review]((D&M, 1990);
- URS, *Phase 1 Environmental Site Assessment - Emoleum Wetherill Park Facility, 24 Davis Road, Wetherill Park, New South Wales (fieldwork – June 2004)* [only executive summary available for review](URS, 2004);
- URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW,* 2006 (reference 42423822) (URS, 2006);
- URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2010 (reference 42424135) (URS, 2010);
- URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424436) (URS, 2012b);
- URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c);
- URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2012 (reference 42424436), 2012 (URS, 2012d);
- URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424444) (URS, 2012e);
- URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01),* 2013 (reference 42424443), 2013 (URS, 2013a);
- URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW (reference 4242443),* 2013 (URS, 2013b);
- URS *Environmental Summary Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW*, 2 May 2013 (reference 42424443) (URS, 2013c); and
- DP *Review of Contamination Reports Proposed Resource Recovery & Recycling Centre 24 Davis Road, Wetherill Park, NSW* (Project 85126.00, dated 19 October 2015)(DP, 2015).

Information from the above reports is provided below and in relevant sections of this report, with selected extracts provided in Appendix C.

4.2 Overview of Previous Contamination Works

DP (2015) reviewed the above documents in conjunction with a site inspection, and made the following summary regarding the contamination issues at the site:

- *"URS have conducted detailed soil investigations of the site, particularly given that soil sampling has been conducted from more than 60 test bores and the minimum sampling density is 30 locations for a 2 ha site according to the NSW EPA Sampling Design Guidelines, 1995. However, soil sample analysis was generally limited to potential contaminants associated with fuel/chemical storage and asphalt manufacturing and not for other potential contaminants such as pesticides and asbestos.*
- *Soil beneath the workshop and laboratory buildings has not been investigated. Soil behind the laboratory (where an asphalt stockpile was observed) has not been investigated;*
- *Soil down-gradient (south) of the existing interceptor pit at the eastern site boundary was not assessed;*
- *Potential soil contamination from the former substation at the west of the site (next to former main manufacturing area) and the current substation between the buildings at the east of the site have not been investigated (for PCB impacts);*
- *Hydrocarbon impacted soil (predominantly impacted with TPH C10-C36) remains in situ at the former manufacturing area. Although URS concluded that no further excavation (chase-out) of TPH C10-C36 impacted soil was required during remediation works and the 95% UCL for contaminants of concern were within the adopted assessment criteria, it is not clearly stated that the contamination identified at test bores SB118, SB121 and SB122 did not need to be addressed further. Also it is unknown if the contamination identified by Dames & Moore (1990) near the workshop is significant;*
- *Similar to above, it is not clearly stated that the contamination identified at test bore SB104, near excavation EX03, did not need to be further addressed.*
- *It is unknown if the contamination identified by Dames & Moore (1990) at the previous solvent wash area (at the middle level) is significant. Results for test bore SB22 (URS, 2006) suggest that it is not significant.*
- *Given that groundwater was monitored from 13 wells spread across the site in three separate events, it is considered that groundwater has been subject to detailed assessment by URS. It is noted that OCP was not tested, although considered to be a potential contaminant of concern in URS, 2004.*
- *Based on data from all groundwater monitoring events, even though some groundwater impacts were detected, it is considered that significant groundwater contamination was not identified (prior to remediation works). Removal of contaminated soil as a result of remediation works may have resulted in improved groundwater quality across the site.*

It is important to note that NSW EPA, 1994 and NEPC, 1999 which were used by URS to source assessment criteria were superseded in April 2014 and May 2013 respectively. The primary guidance for the assessment of contaminated sites is currently:

- *National Environmental Protection Council (NEPC), National Environmental Protection (Assessment of Site Contamination) Measure, 1999 amended 2013 (NEPC, 2013).*

With regard to this change in guidance:

- *Soil Health Investigation Levels (HIL) for metals, PAH and phenols for commercial and industrial sites are generally less conservative in NEPC, 2013 than in NEPC, 1999;*
- *Soil ecological criteria for industrial and commercial sites are presented in NEPC, 2013 for arsenic, copper, chromium, lead, nickel, zinc, DDT, TPH, BTEX, naphthalene and benzo(a)pyrene. It is, however, noted that much of the proposed use of the site will be covered in hardstand and areas of ecological value may be limited to the peripheries of the site (landscape areas);*
- *The primary health-based Screening Levels (HSLs) for TRH, BTEX and naphthalene in soil are based on the potential risk of exposure via the vapour intrusion pathway; and*
- *Management limits are presented in NEPC, 2013 for TPH in soil which take into account the nature and properties of petroleum hydrocarbons, such as the formation of observable light non-aqueous phase liquids, fire and explosive hazards and effects on buried infrastructure.*
- *The TPH assessment criteria in NEPC, 2013 are based on TPH fractions that are different to those presented in NSW EPA, 1994."*

4.3 Summary of Previous Groundwater Assessments

The following groundwater works were undertaken at the site by URS:

- 2006: Construction of 13 groundwater monitoring wells (MW01-MW13), sampling and analysis from the 13 wells (URS, 2006);

Then, following decommissioning of the site

- 2008: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2010);
- 2010: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2012a);
- 2012: Sampling and analysis from the 13 groundwater monitoring wells (URS, 2012e); and
- 2013: decommissioning of the 13 groundwater monitoring wells by filling with grout (bentonite and cement mix) (URS, 2013a).

Appendix C provides extracts of the URS reports, including drawings with conceptual site models, groundwater contours, and groundwater contamination; monitoring well borehole logs and field parameters, including groundwater levels, for the various rounds of groundwater monitoring.

The following pertinent information was provided:

- Groundwater flow was inferred to be in a south-easterly direction toward an unnamed tributary of Prospect Creek (URS, 2006);
- Groundwater was generally encountered within the shale bedrock, although perched groundwater was encountered in filling or at the top of the natural soil in several bores (URS, 2012e);
- The investigation levels used by URS were sourced from NSW EPA, 1994; ANZECC and ARMCANZ, 2000; and National Health and Medical Research Council and National Resource Management Ministerial Council, National Water Quality Management Strategy, Australian Drinking Water Guidelines, 2004 (NHMRC, 2004).

- Various on-site contamination sources were identified in URS (2006) related to the use of the site as an asphalt batching plant. These included above ground storage tanks (bitumen, diesel, kerosene, waste oil); underground storage tanks (fuel, diesel, kerosene); triple/oil interceptors;
- Off-site sources of contamination were identified to comprise oils, fuels and solvents potentially being stored on the metal recycling depot located adjacent the western boundary (across gradient) and oils / fuels potentially being stored on the industrial units located to the east (across gradient). (URS, 2006);
- The analytes included BTEX, PAH, phenols, metals, VCH total organic carbon (TOC), dissolved methane, nitrate, sulphate, ferrous iron and ferric iron for at least one round;
- Phased separated hydrocarbons were not reported in any well over the monitoring events (URS, 2006, 2010, 2012a, 2012e);
- URS considered that as groundwater was not impacted by contaminants of potential concern in the final GME above the assessment criteria with the exception of metals, risks to human health and the environment were low and acceptable. Due to the widespread nature of the detections it was considered by URS that the detections of heavy metals in the groundwater beneath the site were indicative of local groundwater quality (URS, 2013c); and
- It is noted that elevated levels of PAH and TPH C10-C36 were detected in some monitoring events (although not in the final event).

Table 4: URS (2013) Summary of Site-Specific Hydrogeology

Parameter	Description
Groundwater Occurrence	Groundwater was generally encountered within the shale bedrock aquifer across the site. Perched water was encountered in the fill material/ top of natural ground in boreholes SB101 (0.3-0.5mbgl), SB103 (0 to 0.25 mbgl), SB107 (0.2-0.3 mbgl), SB108 (0.1-0.2 mbgl), SB120 (0.3-0.4 mbgl), SB 121 (0.15-1.5 mbgl) SB122 (0-0.2 mbgl) and SB125 (0.3-1.8 mbgl). The perched water appears to be contained within the fill material which overlays natural potentially low permeability clay. SWLs gauged in groundwater wells across the site varied between 0.15 and 3.07 m below top of casing (btoc)
Groundwater Elevation and Flow Direction	Groundwater elevations across the entire site varied between 33.71 (MW01) and 44.25 m AHD (MW13). The inferred direction of groundwater in the groundwater aquifer is in a southerly direction towards the unnamed tributary of Prospect Creek.

Parameter	Description
Hydraulic Conductivity	Based on literature values for the type of lithology encountered beneath the site (shale/ siltstone), the hydraulic conductivity of the aquifer is estimated to be in the order of 1.5E-6 m/year to 3.1E-2 m/ year (Freeze and Cherry, 1979).
Groundwater Velocity	Assuming an effective porosity of 1 to 33% (Freeze and Cherry, 1979) typical for the shale, the groundwater velocity beneath the site is estimated to be in the order of approximately 4.3×10^{-8} to 5.23×10^{-1} m/year
Beneficial Groundwater Use	Groundwater salinity, as calculated from electrical conductivity (EC) readings varies from 700 to 21,344 mg/L total dissolved solids (TDS) indicating fresh to saline water. It is noticeable that TDS readings in MW13, MW08 and MW09 are less than 1,000 mg/L indicting a possible fresher water source. During site visits, surface water pooling was also noted within the gravel cover on the grounds surface in the vicinity of MW08.
Field Parameter Measurement	Ex-situ measurement of dissolved oxygen (DO), oxidation/ reduction potential (redox), pH, EC and temperature is summarised below. DO varied from 0.4 parts per million (ppm)(MW12) to 7.37 (MW11) ppm, indicating poorly to well oxygenated water. Redox Potential results ranged from 172 mV (MW08) to 2.37 (MW04) mV indicating moderately oxidising conditions. Groundwater temperatures ranged from 18.8°C to 23.4°C.

5. Site Walkover

5.1 Site Description and Walkover

The development area is rectangular in shape and slopes moderately steeply from the northern boundary down to Davis Road on the southern boundary. The site covers an area of approximately 20,292 m^2. Site photographs are provided in Appendix D.

The following infrastructure is present on the site:

- A workshop, laboratory, storeroom and amenities buildings and substation located towards the eastern boundaries of the site;

- Concrete stockpile bays in the middle level of the site - in the centre and on the eastern boundary;
- In-ground recycled water tanks in the south of the site adjacent to the office building;
- A remnant shelter on the higher level towards the eastern boundary;
- Batter slopes and retaining walls between higher middle and lower levels of the site;
- An oil separator pit on the middle level on the eastern boundary of the site;
- The majority of the site is sealed with asphalt except for some areas on the upper and lower levels where remediation works have occurred.

An inspection of the site and surrounds was conducted by DP on 2 February 2016.

The site had three main levelled areas, consistent with previous levelling and contouring for site development, comprising and upper, middle and lower levelled area. An internal roadway on the western side of the site connected the levels.

No evidence of bedrock outcrops, springs or seepages was noted within the site.

A scrap metal landuse was noted to the west (cross-gradient) of the site, with activities appearing to include crushing of cars.

5.2 Surrounding Water Bodies

Prospect Creek and its unnamed tributary in the vicinity of the site were inspected at the time of the site visit.

The tributary, where it crossed Elizabeth Street, was observed to be a concrete lined canal estimated to be in the order of 3 m deep. A small volume of water was flowing at the time of the site visit (refer to Photograph 7, Appendix D).

Prospect Creek, where it crossed Reconciliation Drive, was observed to be approximately 1 m wide and flowing, with reeds and vegetation around it on a floodplain (refer to Photograph 8, Appendix D).

Prospect Reservoir, to the north (up-gradient) of the site, was not inspected.

It is considered unlikely that groundwater from the site is contributing significantly to the observed surface water bodies.

6. Summary Hydrogeology

Based on the regional information and previous reports discussed above, the following hydrogeological conditions are expected at the site:

- The upper geological profile, comprising the Wianamatta Group, is in effect an aquitard, and may be in the order of 100 m or more in thickness in the area of the site;

- Water in the upper horizons of the Hawkesbury Sandstone, beneath the Wianamatta Group, in the region of the site may be impacted by salinity from the overlying shale;
- A water bearing zone exists in the upper weathered horizon of the Bringelly Shale of the Wianamatta Group, with standing water levels between 0.15 and 3.07 m btoc (URS, 2013) in boreholes drilled to depths of 5.5 m to 10.2 m bgl, (noting the wells were finished with Gatic covers at the ground surface). Water observations during drilling mainly indicated that the substrate appeared to be predominantly dry during drilling, with the exception of two locations where wet soils were observed at approximately 4 m bgl;
- Published typical bulk hydraulic conductivity for the weathered Bringelly Shale are in the order of 10^{-6} to 10^{-9} m/s;
- Electrical conductivity readings by URS showed considerable variability over the site, consistent with the formation having limited hydraulic connectivity. Some of the readings were too saline for most possible beneficial uses.
- Petroleum-based contamination previously detected in groundwater at the site was not recorded as being spatially or temporally persistent, with all results less that the laboratory limits of reporting in the last monitoring round;
- Elevated levels of metals previously detected in groundwater at the site were considered by URS to most likely be attributable to background water quality; and
- The DPI registered bores indicate that groundwater is not being used within at least one kilometre of the site.

7. Proposed Development and Potential for Contamination

Plans of the current and proposed site layouts are provided in Appendix A.

The proposed development is for a resource recovery facility. The below information on the proposed development has been sourced from the RPS Group *Greenspot Resource Recovery Centre State Significant Development Preliminary Environmental Assessment Lot 18 DP 249417 24 Davis Road, Wetherill Park, NSW* (PR127695; November 2015).

The Resource Recovery Facility is proposed to process up to 200,000 tonnes/ year of materials which would benefit those Councils, businesses and industries requiring an alternative to waste disposal through the recovery and beneficial use of valuable resources. The recovered resources would be transferred either directly to end markets or to other facilities or processors for value adding to achieve maximum value for the beneficial use. The facility is also proposed to act as a distribution centre for recycled materials and for the distribution and marketing of bulk landscape supplies including barks, sands and aggregates.

It is proposed to primarily accept the following waste streams at the facility:

- Hydro-excavation and drill muds/fluids for consolidation and removal from site for use as structural fill or as a feedstock within a soil conditioner and compost manufacturing;
- Bulk landscaping supplies for distribution into the surrounding areas; and
- Garden organics, commingled food and garden organics and food waste.

Detailed below are the approximate amounts of waste for each stream to be received at the site:

- 60,000 tonnes of hydro-excavation and drill mud/fluids per annum (pa);
- 40,000 tonnes of bulk landscaping supplies pa; and
- 100,000 tonnes of garden organics, commingled food and garden organics and food waste pa.

The recycling activities associated with the proposed development are briefly described as follows:

- **Separation and Consolidation of Hydro-Excavation, Drill Muds and Fluids**
  Hydro-excavation and drill muds/fluids will enter the site via a weighbridge whereby the consignment will be checked. Hydro-excavation and drill muds/fluids will be unloaded in purpose built receival and settling bays (mid-level) to allow for the separation of liquids and solids. Liquids will be drained by gravity to a designated 60,000 litre storage tank which will have the capacity to agitate the liquid to minimise the settling of any silt and clay within the storage tank. The solids will either be transferred to end use site as engineered fill in accordance with the respective EPA resource recovery order or be blended with other organics and recycled materials to produce a range of landscaping products.
- **Bulk Landscaping Supplies**
  Bulk loads of landscaping materials are proposed to be bought to the site from regional areas of NSW for storage and redistribution into the Sydney landscape market. Some materials may also be used in the preparation of purpose designed blended products again to be used in the landscaping industry or in soil rejuvenation projects. Types of landscaping materials to be received and stored onsite include soil, compost, sands, barks and aggregates. Existing purpose built bays (mid-level) will be used and others will be constructed whereby raw materials will be unloaded, stored, possibly blended and then loaded out for distribution to various end use applications.
- **Sorting and Consolidation of Garden Organics and Food Waste**
  Garden organics, commingled garden and food organics, and food waste are proposed to be received for sorting, decontamination shredding and consolidation prior to being transported off site to Bettergrow owned and operated composting facilities for further processing and conversion to valuable soil enhancement products. Unloading will occur within an enclosed, purpose built building (upper level) with an approximate floor area of 2,200 m^2. The building will be designed with appropriate ventilation systems and odour control features to minimise odour release and provide a safe and healthy work environment for staff and neighbouring industries.

Existing onsite infrastructure will be utilised where possible for the development, including site office, workshop, shedding, staff amenities, raw material bays, roading and car parks, and stormwater management structures. Improvements and/or repairs will be undertaken of the above infrastructure items where required.

New site infrastructure will be constructed to accommodate the proposed activities, including buildings for the sorting of food, garden, and organic wastes, hydro-excavation and drill mud settling bays, storage and settling tanks, weigh bridge, and gross pollutant trap.

The proposed Food Depackaging and Process Building (refer to Style Developments Pty Ltd drawings on Sheets C01 and C03 in Appendix A) includes a tipping pit for receipt of food for recycling. The proposed dimensions of the pit are 12 m by 6 m, by 3 m deep (44 m AHD)(to the top of the base slab).

Allowing for a concrete slab and subgrade, additional excavation in the order of 0.5 to 1 m is expected (i.e. a potential total excavation level to 43 m AHD). It is understood that it is proposed that the pit will include an impermeable barrier to prevent leakage of leachate into the surrounding ground.

8. Comments

8.1 Potential Groundwater Impacts

The current site gradient and significant area of hardstand/ compacted soils will limit infiltration over much of the site in its current condition. Where possible the proposed development will use the current site infrastructure, minimising changes to infiltration at the site. Soft landscaping areas, with the highest potential for infiltration, are proposed to be retained.

The majority of materials imported onto the site are expected to be solids which have a negligible potential to impact on groundwater.

An enclosed building will be constructed for handling of food, garden, and organic wastes, minimising the potential for runoff from these materials entering the groundwater. No composting is proposed to be undertaken at the site.

The proposed tipping pit in the Food Depackaging and Process Building is located in the vicinity of previous boreholes URS MW10 and MW11. Four groundwater level readings were recorded by URS between 2005 and 2012, with groundwater levels in these two wells being recorded between 41.42 m and 43.97 m AHD. The base of the proposed excavation (including for subgrade preparation) is in the order of 43 m AHD, which is below the highest groundwater level recorded by URS in the two wells located closest to the pit. A pit to this depth would need to be of suitable design to penetrate the groundwater table, either by tanking or an appropriate drainage system (if approved by the NSW Department of Primary Industries Office of Water (NOW)).

The pit is proposed to be lined with an impermeable barrier to prevent leakage of leachate into the surrounding ground.

Purpose built settling bays, storage and settling tanks will be constructed for the hydro-excavation and drill muds/fluids, limiting the potential for these materials to enter groundwater at the site. These materials are generally considered to have a low risk of containing significant quantities of contamination.

The proposed development is considered to have negligible potential for significant interference with groundwater; involves only minor changes to the potential for infiltration at the site; and has a relatively low risk of discharging potential contaminants.

The hydrogeological review indicates that it is unlikely that any significant groundwater resource is located in the upper 100 m of the subsurface profile. The Hawkesbury Sandstone aquifer vulnerability is considered to be low due to its depth, and the low permeability and connectivity of water in the Wianamatta Group which is exposed at the site.

8.2 Conclusions

Overall, it is considered that the proposed development poses a low risk of significantly impacting groundwater supply or quality. Specifically:

- **Beneficial Groundwater Use**
  Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site.

  Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and DPI registered bores do not show any current beneficial use in the area of the site.

  The proposed development is considered to have a negligible risk of impacting the quality or supply of groundwater at the site.

- **Groundwater Dependent Ecosystems**
  There are no high priority GDE within or near the site. The proposed development is not considered to present a potential risk to GDE.

- **Impacts on Bores and Natural Drainage Features**
  The proposed development is not considered to present a potential risk to bores or natural drainage features.

8.3 Contingency Measures and Recommendations

As with any activity, appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required, and will mitigate further the already low risk posed by the development on groundwater at the site.

Areas where liquid wastes or dangerous goods are to be handled should have appropriate containment measures to prevent leachate/ spillage from entering the ground. This will include, as a minimum, the proposed tipping pit in the Food Depackaging and Process Building. Containment measures should include an impermeable liner (e.g. HDPE or a compacted clay layer), bunding and spillage/ overflow contingency measures.

Furthermore, the currently proposed excavation level for the tipping pit (in the order of 43 m AHD) will require appropriate design in consideration of it extending below the measured water table in the two previous wells located closest to the proposed pit. This may trigger the NSW Aquifer Interference Policy, administered by NOW. This design could include tanking or an appropriately drained system (if approved by NOW). Alternately the pit could be redesigned to reduce potential interaction with groundwater as discussed below.

If the pit is to be redesigned to reduce the potential for interference with groundwater, it is recommended that the excavation level (i.e. to the base of the sub-grade) be no lower than 44.5 m AHD, i.e. at least 0.5 m above the highest recorded groundwater level in the two former wells located closest to the pit. It is considered that this would result in minimal interference of the pit with groundwater during normal conditions, although groundwater could potentially rise to the level of the pit during high rainfall events. As such an appropriate pressure relief system/ valve would need to be

installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events. The pressure relief system would need to be designed to minimise the potential for leakage of leachate through the impermeable lining. Any water ingressing through this system would need to be managed and disposed of as potentially contaminated leachate.

If groundwater is encountered during construction of foundations for any of the proposed new structures it is expected to comprise water in the Bringelly Shale aquitard. The water would be expected to be of limited quantity, connectivity and of low quality with respect to potential for beneficial use. Standard construction and water management/ disposal methods are considered suitable for any water encountered under this scenario.

It is considered appropriate to construct monitoring wells into the upper weathered shale profile to obtain background groundwater quality for comparison purposes in the future. Monitoring at 6 monthly intervals over a period of two years would provide a good background dataset for the proposed development. If the monitoring identified significant variation in the groundwater quality, further monitoring should be undertaken to provide a better understanding of the background conditions and variability.

If a potentially contaminating substance is to be stored or used on the site in the future, further groundwater monitoring should be undertaken, if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater.

In the event of a leakage or spillage of leachate or other potentially contaminating liquid, assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and/ or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds.

9. References

1. Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council (ANZECC) *Guidelines for Groundwater Protection in Australia*, September 1995 (ANZECC, 1995)
2. Dames and Moore, *Mobil Site Audit Assessment Form*, 1990 [only pages 1 and 2 and a sketch available for review]((D&M, 1990)
3. DP *Review of Contamination Reports Proposed Resource Recovery & Recycling Centre 24 Davis Road, Wetherill Park, NSW* (Project 85126.00, dated 19 October 2015)(DP, 2015)
4. Fairfield Local Environmental Plan 2013
5. Geoscience Australia *Australian Stratigraphic Units Database*, accessed 18 March 2016. http://dbforms.ga.gov.au/pls/www/geodx.strat_units.int
6. Herbert, C & Smith, V, Penrith 1:100,000 Geology Sheet Edition 1, 1991
7. McNally, G 2004, 'Shale, Salinity And Groundwater In Western Sydney', *Australian Geomechanics* Vol 39 No 3, September 2004 pp107-122
8. NSW Department of Environment, Climate Change and Water (DECCW) *State of the Catchments 2010: Sydney Metropolitan region: Groundwater* (2010) (DECCW, 2010)

9. NSW Department of Infrastructure, Planning and Natural Resources, *Map of Salinity Potential in Western Sydney*, 2002

10. NSW Office of Water (NOW) *Water Sharing Plan Greater Metropolitan Region Groundwater Sources Background document* (2011) (NOW, 2011)

11. Lovering, J. F., 1954. The stratigraphy of the Wianamatta Group Triassic System, Sydney Basin. *Records of the Australian Museum* 23(4): 169–210, plate xii. [25 June 1954]

12. RPS Group *Greenspot Resource Recovery Centre State Significant Development Preliminary Environmental Assessment Lot 18 DP 249417 24 Davis Road, Wetherill Park, NSW*, 2015 (reference PR127695)

13. *Rules summary sheet for the Sydney Basin Central Groundwater Source (*July 2011)

14. URS, *Phase 1 Environmental Site Assessment - Emoleum Wetherill Park Facility, 24 Davis Road, Wetherill Park, New South Wales (fieldwork – June 2004)* [only executive summary available for review](URS, 2004)

15. URS, *Phase 2 Environmental Site Assessment, Emoleum Depot, 24 Davis Road, Wetherill Park, NSW,* 2006 (reference 42423822) (URS, 2006)

16. URS, *Final Report, Annual Groundwater Monitoring Event October 2008, Former Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2010 (reference 42424135) (URS, 2010)

17. URS, *Annual Groundwater Monitoring Event, Former Mobil Emoleum Depot (Site No. 6F01), 24 Davis Road, Wetherill Park NSW*, 2012 (reference 42424273/01/01) (URS, 2012a)

18. URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424436) (URS, 2012b)

19. URS, *Dilapidation Survey, 24 Davis Road, Wetherill Park,* 2012 (reference 42424436) (URS 2012c)

20. URS, *Hazardous Building Materials Survey, Former Mobil Emoleum Depot, 24 Davis Road, Wetherill Park NSW,* 2012 (reference 42424436), 2012 (URS, 2012d)

21. URS, *Post Phase 2 Environmental Site Assessment, Former Mobil Depot Wetherill Park (6F01), 24 Davis Road, Wetherill Park*, 2012 (reference 42424444) (URS, 2012e)

22. URS, *Letter Report – Groundwater Monitoring Well Decommissioning, Former Emoleum Depot, Wetherill Park NSW (6F01),* 2013 (reference 42424443), 2013 (URS, 2013a)

23. URS, *Soil Validation Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW (reference 4242443),* 2013 (URS, 2013b)

24. URS *Environmental Summary Report, Former Emoleum Depot (6F01), 24 Davis Road, Wetherill Park, NSW*, 2 May 2013 (reference 42424443) (URS, 2013c)

25. *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011*

26. NSW Department of Primary Industries Office of Water *NSW Aquifer Interference Policy*, 2012

10. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at 24 Davis Road, Wetherill Park in accordance with DP's proposal SYD151689 Rev1 dated 19 January 2016 and acceptance received from Mr Neil Schembri dated 22 January 2016. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Bettergrow Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied

upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. 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 on the site only at the specific sampling and/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 human influences. Such changes may occur after field testing has been completed.

DP's advice is based upon the information reviewed as discussed herein, including conditions encountered during the reviewed investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing 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 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 stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

Site Drawings

About this Report

Douglas Partners

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.

IMPORTANT NOTE: DETAIL SURVEY

1. THIS PLAN WAS PREPARED FOR THE SOLE PURPOSES OF THE CLIENT FOR THE SPECIFIC PURPOSE OF PRODUCING A DETAIL PLAN. THIS PLAN IS STRICTLY LIMITED TO THE PURPOSE AND DOES NOT APPLY DIRECTLY OR INDIRECTLY AND WILL NOT BE USED FOR ANY OTHER APPLICATION, PURPOSE, USE OR MATTER. THE PLAN IS PRESENTED WITHOUT THE ASSUMPTION OF A DUTY OF CARE TO ANY OTHER PERSON (OTHER THAN THE CLIENT) ("THIRD PARTY") AND MAY NOT BE RELIED ON BY THIRD PARTY.

2. RPS AUSTRALIA EAST PTY LTD WILL NOT BE LIABLE (IN NEGLIGENCE OR OTHERWISE) FOR ANY DIRECT OR INDIRECT LOSS, DAMAGE, LIABILITY OR CLAIM ARISING OUT OF OR INCIDENTAL TO:
A. A THIRD PARTY PUBLISHING, USING OR RELYING ON THE PLAN;
B. RPS AUSTRALIA EAST PTY LTD RELYING ON INFORMATION PROVIDED TO IT BY THE CLIENT OR A THIRD PARTY WHERE THE INFORMATION IS INCORRECT, INCOMPLETE, INACCURATE, OUT-OF-DATE OR UNREASONABLE;
C. ANY INACCURACIES OR OTHER FAULTS WITH INFORMATION OR DATA SOURCED FROM A THIRD PARTY;
D. RPS AUSTRALIA EAST PTY LTD RELYING ON SURFACE INDICATORS THAT ARE INCORRECT OR INACCURATE;
E. THE CLIENT OR ANY THIRD PARTY NOT VERIFYING INFORMATION IN THIS PLAN WHERE RECOMMENDED BY RPS AUSTRALIA EAST PTY LTD;
F. LODGMENT OF THIS PLAN WITH ANY LOCAL AUTHORITY AGAINST THE RECOMMENDATION OF RPS AUSTRALIA EAST PTY LTD;
G. THE ACCURACY, RELIABILITY, SUITABILITY OR COMPLETENESS OF ANY APPROXIMATIONS OR ESTIMATES MADE OR REFERRED TO BY RPS AUSTRALIA EAST PTY LTD IN THIS PLAN.

3. WITHOUT LIMITING PARAGRAPH 1 OR 2 ABOVE, THIS PLAN MAY NOT BE COPIED, DISTRIBUTED, OR REPRODUCED BY ANY PROCESS UNLESS THIS NOTE IS CLEARLY DISPLAYED ON THE PLAN.

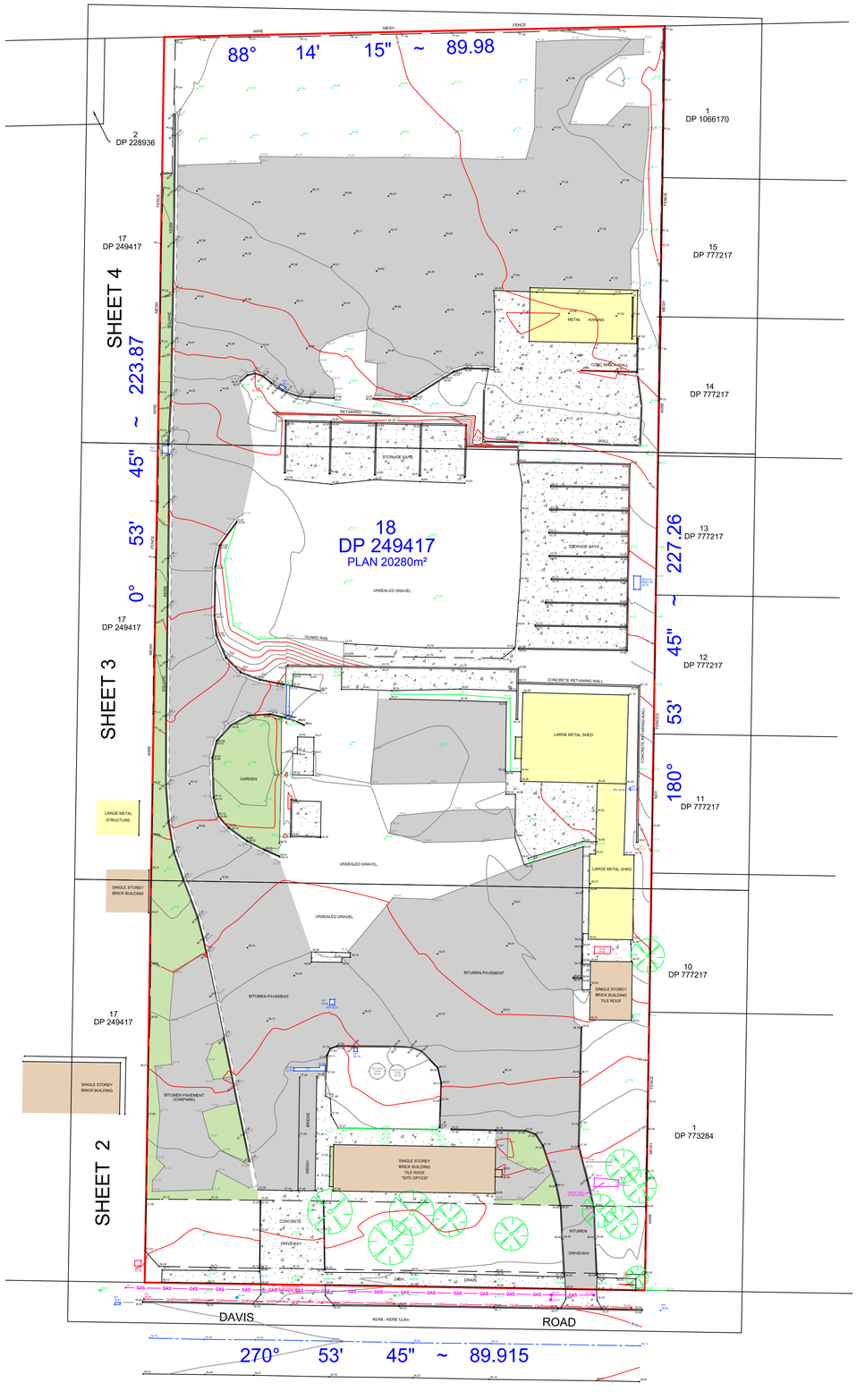
4. THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY AND NOT BY FIELD SURVEY. IF NOT ABLE TO BE SO LOCATED, SERVICES HAVE BEEN PLOTTED FROM THE RECORDS OF RELEVANT AUTHORITIES WHERE AVAILABLE AND HAVE BEEN NOTED ACCORDINGLY ON THIS PLAN. WHERE SUCH RECORDS EITHER DO NOT EXIST OR ARE INADEQUATE A NOTATION HAS BEEN MADE HEREON.

5. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

6. ONLY VISABLE PITS WERE LOCATED AND THOSE THAT DO NOT SHOW INVERTS WERE DEEMED INACCESSIBLE.

LEGEND

- BOUNDARY
- ADJOINING BOUNDARY
- FENCE
- GAS
- OVERHEAD POWER
- TELSTRA PIT
- HYDRANT
- TREE
- GAS MARKER
- BUILDING HATCH
- MISC HATCH
- CONCRETE HATCH
- ROAD HATCH
- GARDEN HATCH



MGA

DIAL 1100 BEFORE YOU DIG

TITLE:	PLAN SHOWING DETAIL SURVEY LOT 18 DP 249417	LOCATION:	24 DAVIS ROAD WETHERILL PARK	DATUM: PROJECTION:	AHD (GPS SSM75574) MGA (DP1066170)	DATE: PURPOSE:	14-10-2015 DETAIL
AUTOCAD REF: VERSION (PLAN BY):	127695-151014-DETAIL 3 (8-3-2016)	CLIENT: JOB REF:	BETTER GROW PR127695-4				

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

ODOUR SCRUBBER TOWERS

WATER STORAGE TANKS

HOOKLIFT TRUCK

ORGANICS BUILDING REFER SHEETS B01–B04

OFFICE LOCATION 18.8m X 6m REFER SHEET D01

REVERSING AND EXIT TRUCK AND TRAILER ASSUMED 19m LONG

FOOD DEPACKAGING BUILDING REFER SHEETS C01–C03

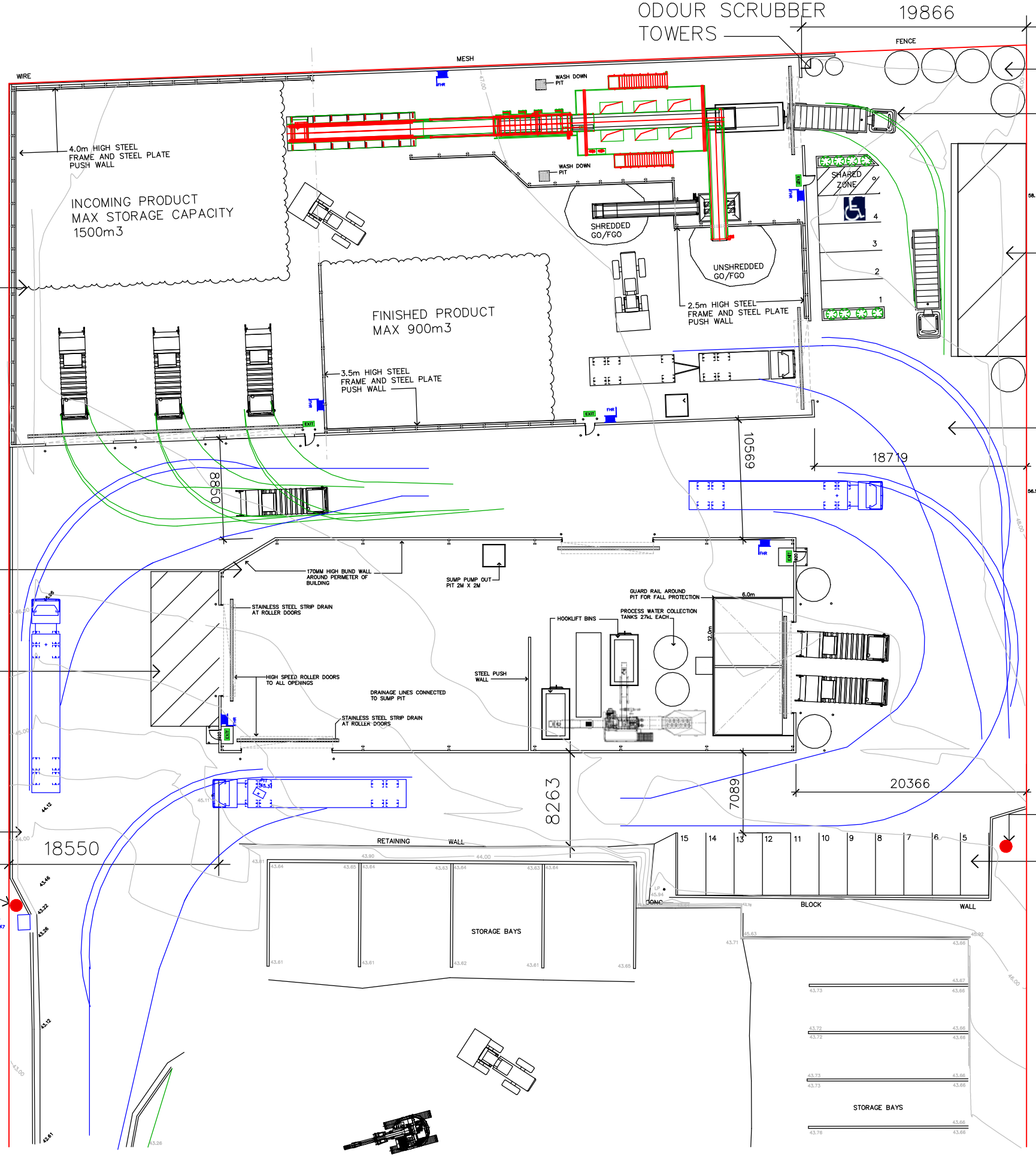
TRUCK LOADING BAY 6m x 13.5m

WIDEN ROAD TO ALLOW FOR TRUCK TURNING

NEW FIRE HYDRANT STAND POINT AS PER AUSTRALIAN STANDARDS

NEW FIRE HYDRANT STAND POINT AS PER AUSTRALIAN STANDARDS

CARPARKING 11 SPACES



PROPOSED PART SITE PLAN

SCALE 1: 200

ISSUE	BY	DESCRIPTION	DATE
	GR		

BetterGROW
48 INDUSTRY ROAD
VINEYARD NSW 2765
P: 02 4587 7852
F: 02 4577 2603
WWW.BETTERGROW.COM.AU

NORTH

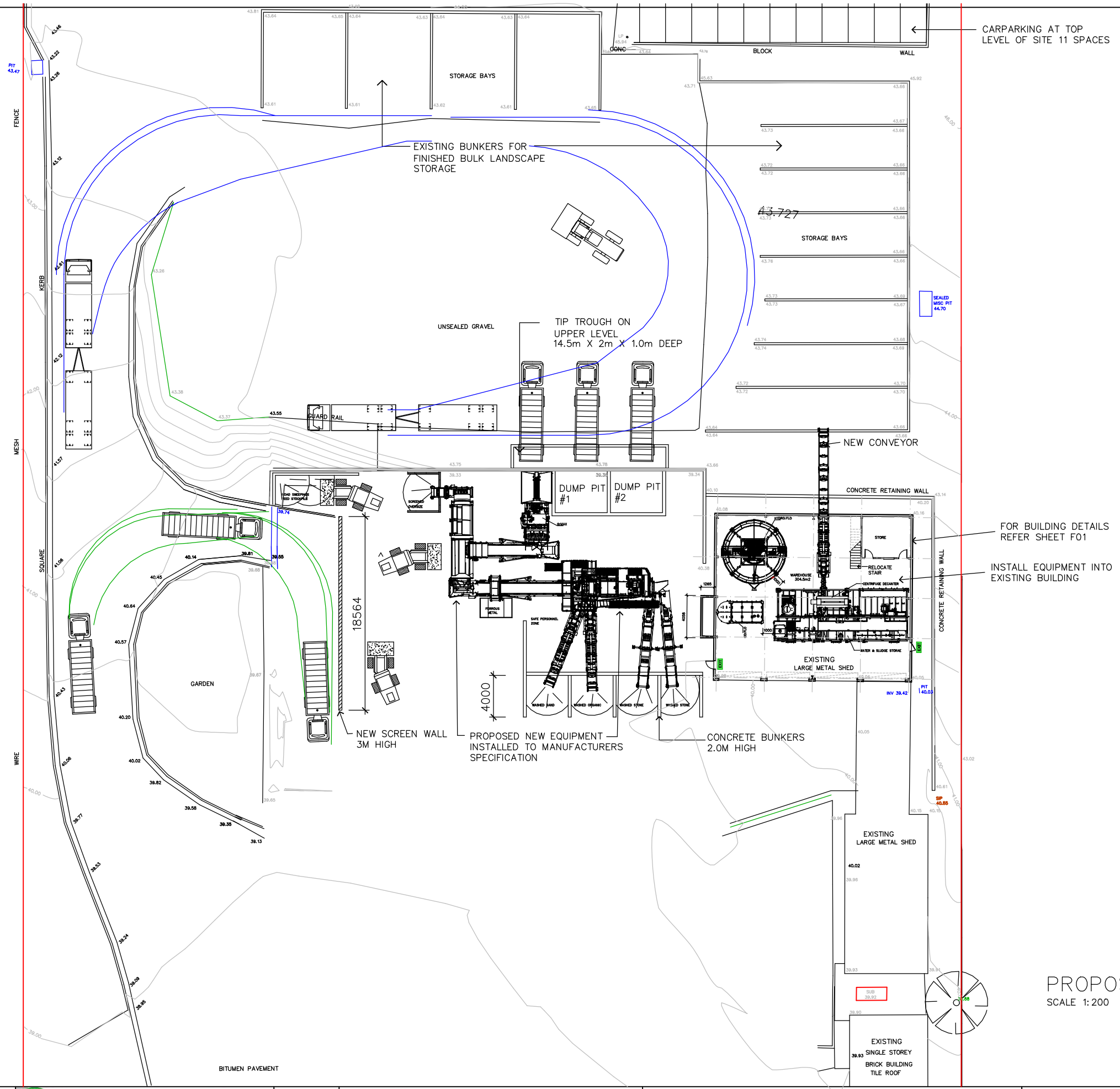
DIAL BEFORE YOU DIG www.1100.com.au

GENERAL NOTES:
1. ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERIFIED BY THE BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS FROM A DETAILED SURVEY
3. FIGURED DIMENSIONS MUST BE TAKEN IN PREFERENCE TO SCALING
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY BUILDING WORK
5. WHERE ENGINEERING DRAWINGS ARE REQUIRED SUCH MUST TAKE PRECEDENT OVER THIS DRAWING
6. STORMWATER TO BE DISCHARGED TO COUNCILS'S REQUIREMENTS AND AS 3500.3–2003
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH RELEVANT AUTHORITIES BEFORE ANY BUILDING WORK COMMENCES
8. ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS
9. TERMITE PROTECTION TO BE INSTALLED IN ACCORDANCE WITH AS3660.1–1995 PART 1 NEW BUILDINGS
10. SMOKE DETECTORS TO BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE

STYLE DEVELOPMENTS PTY LTD
2051–2053 THE NORTHERN ROAD
GLENMORE PARK NSW 2745
M: +61 2 419 404 103
E: info@styledevelopments.com.au
W: www.Styledevelopments.com.au
ARCHITECTURAL DESIGN | ENGINEERING
CONSTRUCTION | PROJECT MANAGEMENT
styledevelopments
DESIGN | PROJECT MANAGEMENT | PROPERTY DEVELOPMENT | CONSTRUCTION

PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164		PROJECT NO. 1521
CLIENT	BETTERGROW		SCALE 1: 200
TITLE	ORGANICS RECEIVAL AND PROCESS BUILDING SITE PLAN	JOB NO. 0604–16	SHEET NO. A02 / ISSUE A

A1 SHEET



PROPOSED PART SITE PLAN

SCALE 1: 200

ISSUE	BY	DESCRIPTION	DATE
	GR		

BetterGROW
48 INDUSTRY ROAD
VINEYARD NSW 2765
P: 02 4587 7852
F: 02 4577 2603
WWW.BETTERGROW.COM.AU

NORTH

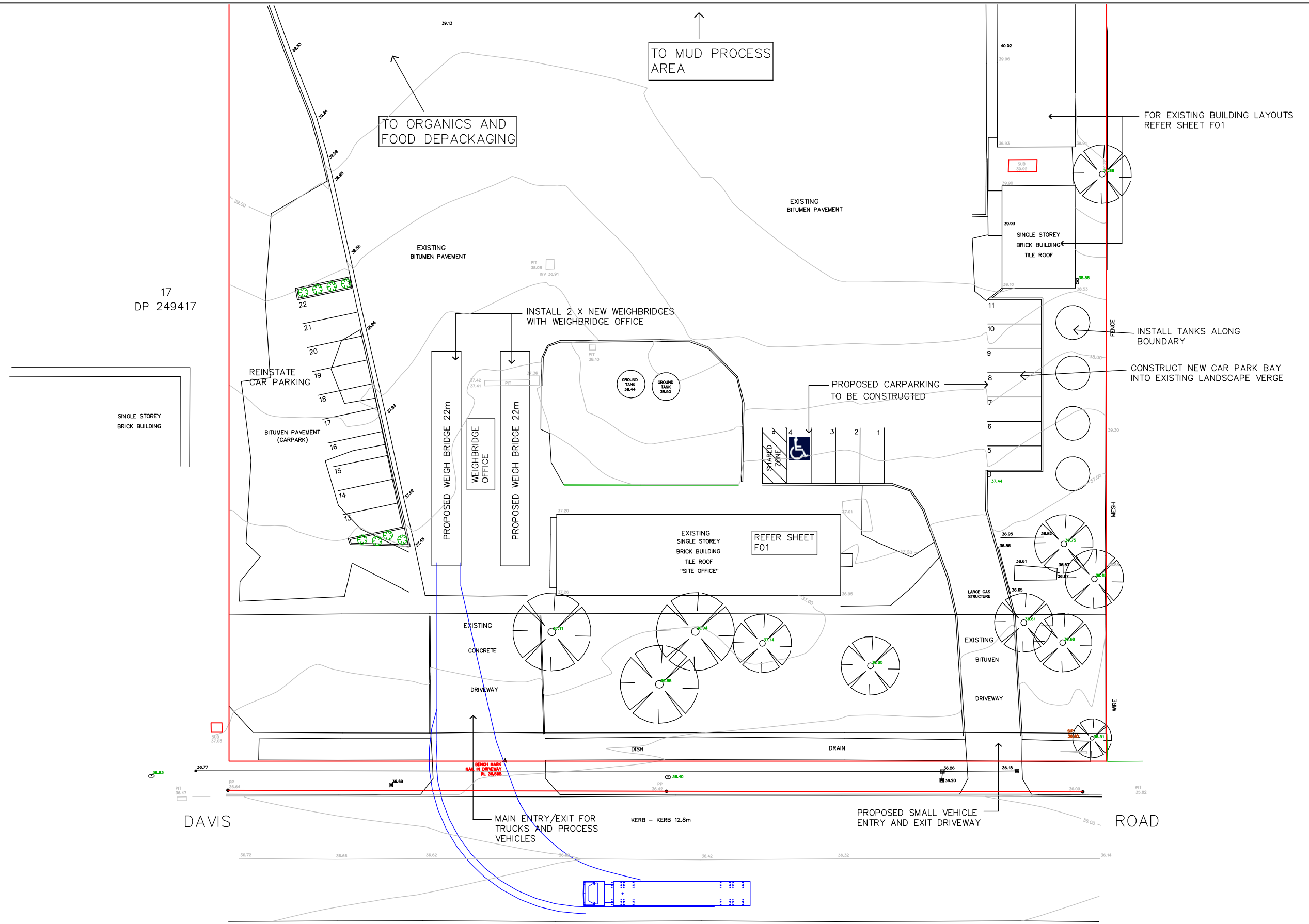
DIAL BEFORE YOU DIG www.1100.com.au

GENERAL NOTES:
1. ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERFIED BY THE BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS FROM A DETAILED SURVEY
3. FIGURED DIMENSIONS MUST BE TAKEN IN PREFERENCE TO SCALING
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY BUILDING WORK
5. WHERE ENGINEERING DRAWINGS ARE REQUIRED SUCH MUST TAKE PRECEDENT OVER THIS DRAWING
6. STORMWATER TO BE DISCHARGED TO COUNCILS'S REQUIREMENTS AND AS 3500.3– 2003
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH RELEVANT AUTHORITIES BEFORE ANY BUILDING WORK COMMENCES
8. ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS
9. TERMITE PROTECTION TO BE INSTALLED IN ACCORDANCE WITH AS3660.1– 1995 PART 1 NEW BUILDINGS
10. SMOKE DETECTORS TO BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE

STYLE DEVELOPMENTS PTY LTD
2051–2053 THE NORTHERN ROAD
GLENMORE PARK NSW 2745
M: +61 2 419 404 103
E: info@styledevelopments.com.au
W: www.Styledevelopments.com.au
ARCHITECTURAL DESIGN | ENGINEERING
CONSTRUCTION | PROJECT MANAGEMENT
styledevelopments
DESIGN | PROJECT MANAGEMENT | PROPERTY DEVELOPMENT | CONSTRUCTION

PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164
PROJECT NO.	1521
CLIENT	BETTERGROW
SCALE	1: 200
TITLE	MUD PROCESS AREA PROPOSED SITE PLAN
JOB NO.	0604– 16
SHEET NO.	A03
ISSUE	A

A1 SHEET



PROPOSED PART SITE PLAN

SCALE 1: 200

ISSUE	BY	DESCRIPTION	DATE
	GR		

BetterGROW
48 INDUSTRY ROAD VINEYARD NSW 2765
P: 02 4587 7852
F: 02 4577 2603
WWW.BETTERGROW.COM.AU

NORTH

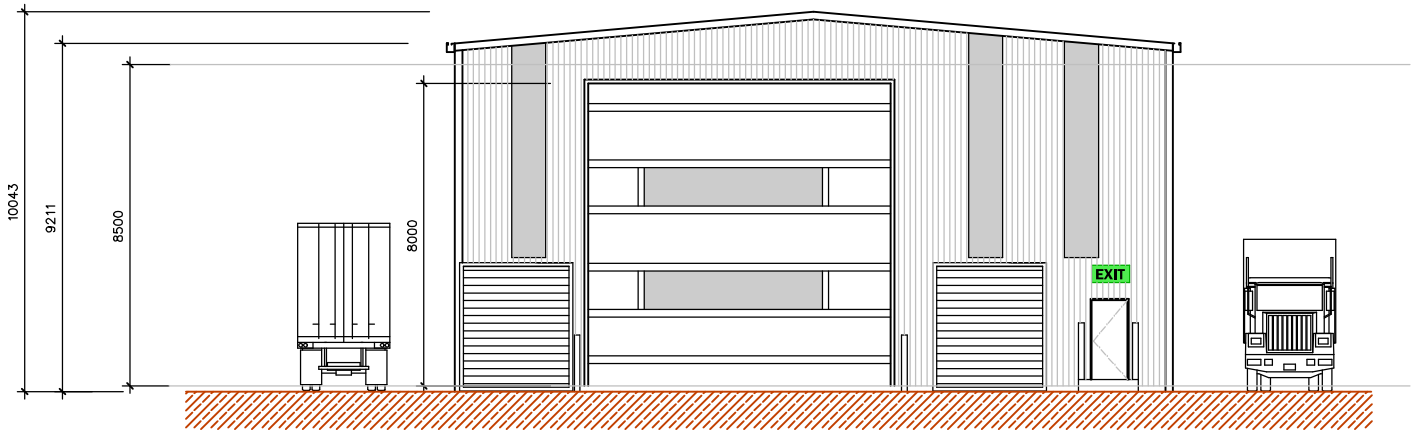
DIAL BEFORE YOU DIG www.1100.com.au

GENERAL NOTES:
1. ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERFIED BY THE BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS FROM A DETAILED SURVEY
3. FIGURED DIMENSIONS MUST BE TAKEN IN PREFERENCE TO SCALING
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY BUILDING WORK
5. WHERE ENGINEERING DRAWINGS ARE REQUIRED SUCH MUST TAKE PRECEDENT OVER THIS DRAWING
6. STORMWATER TO BE DISCHARGED TO COUNCIL'S REQUIREMENTS AND AS 3500.3– 2003
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH RELEVANT AUTHORITIES BEFORE ANY BUILDING WORK COMMENCES
8. ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS
9. TERMITE PROTECTION TO BE INSTALLED IN ACCORDANCE WITH AS3660.1– 1995 PART 1 NEW BUILDINGS
10. SMOKE DETECTORS TO BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE

STYLE DEVELOPMENTS PTY LTD
2051–2053 THE NORTHERN ROAD
GLENMORE PARK NSW 2745
M: +61 2 419 404 103
E: info@styledevelopments.com.au
W: www.Styledevelopments.com.au
ARCHITECTURAL DESIGN | ENGINEERING CONSTRUCTION | PROJECT MANAGEMENT
styledevelopments
DESIGN | PROJECT MANAGEMENT | PROPERTY DEVELOPMENT | CONSTRUCTION

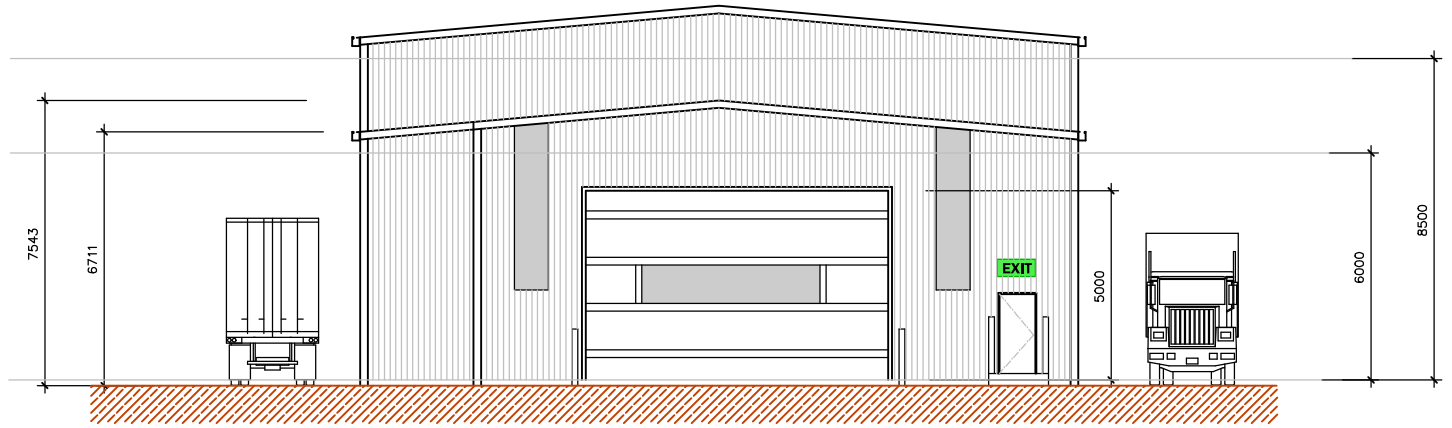
PROJECT	PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164
PROJECT NO.	1521
CLIENT	BETTERGROW
SCALE	1: 200
TITLE	SITE ENTRY AND PARKING PROPOSED SITE PLAN
JOB NO.	0604– 16
SHEET NO.	A04
ISSUE	A

A1 SHEET



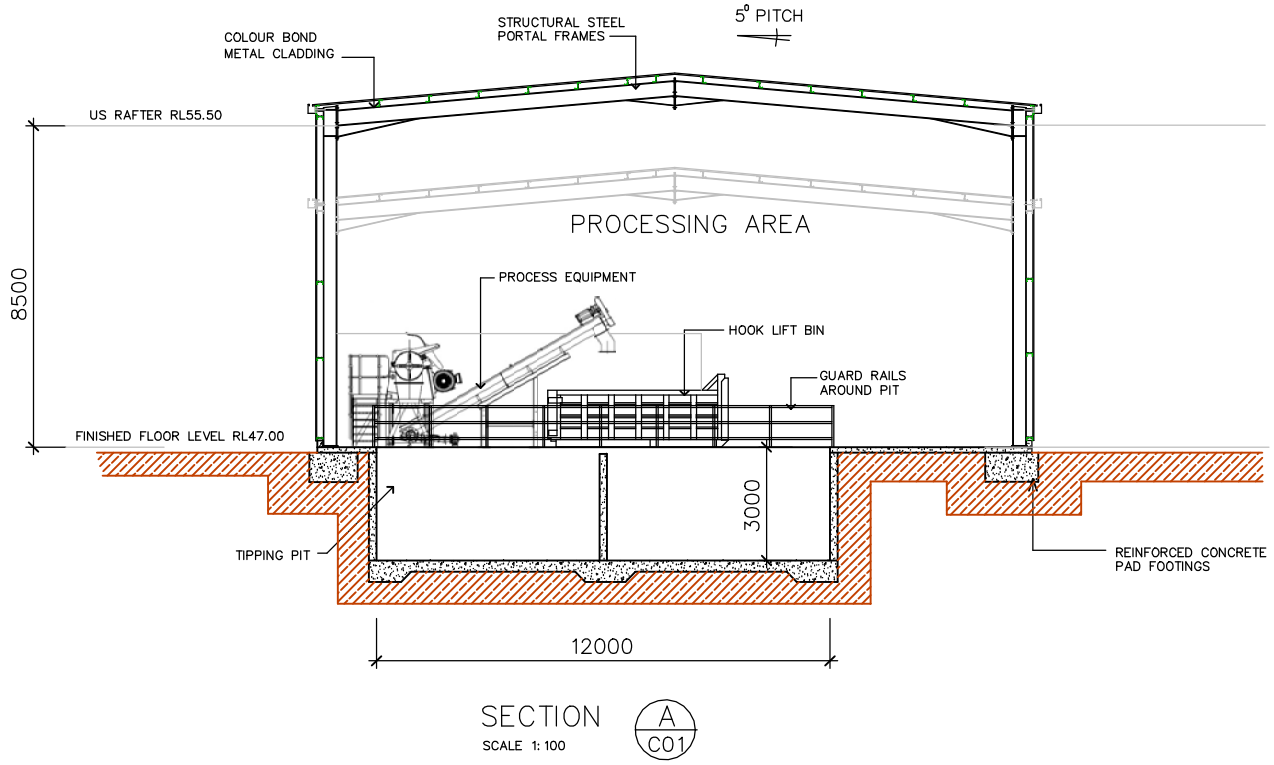
EAST ELEVATION

SCALE 1: 100



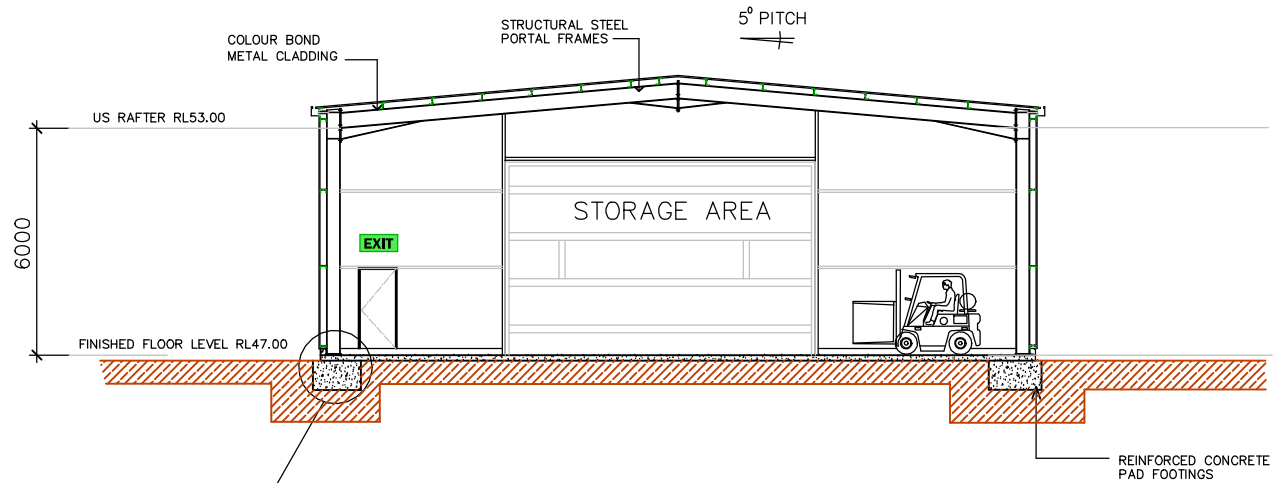
WEST ELEVATION

SCALE 1: 100



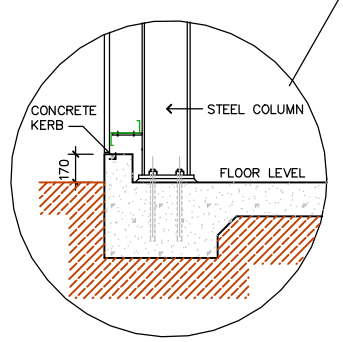
SECTION A C01

SCALE 1: 100



SECTION B C01

SCALE 1: 100



PERIMETER KERB DETAIL

FOR VISUAL CONCEPTS ONLY

ISSUE	BY	DESCRIPTION	DATE
	GR		

BetterGROW
48 INDUSTRY ROAD
VINEYARD NSW 2765
P: 02 4587 7852
F: 02 4577 2603
WWW.BETTERGROW.COM.AU

NORTH

DIAL BEFORE YOU DIG www.1100.com.au

GENERAL NOTES:

1. ALL DIMENSIONS AND FLOOR AREAS ARE TO BE VERIFIED BY THE BUILDER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER
2. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS FROM A DETAILED SURVEY
3. FIGURED DIMENSIONS MUST BE TAKEN IN PREFERENCE TO SCALING
4. ALL BOUNDARY CLEARANCES MUST BE VERIFIED BY THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY BUILDING WORK
5. WHERE ENGINEERING DRAWINGS ARE REQUIRED SUCH MUST TAKE PRECEDENT OVER THIS DRAWING
6. STORMWATER TO BE DISCHARGED TO COUNCIL'S REQUIREMENTS AND AS 3500.3–2003
7. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH RELEVANT AUTHORITIES BEFORE ANY BUILDING WORK COMMENCES
8. ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS
9. TERMITE PROTECTION TO BE INSTALLED IN ACCORDANCE WITH AS3660.1– 1995 PART 1 NEW BUILDINGS
10. SMOKE DETECTORS TO BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE

STYLE DEVELOPMENTS PTY LTD
2051–2053 THE NORTHERN ROAD
GLENMORE PARK NSW 2745
M: +61 2 419 404 103
E: info@styledevelopments.com.au
W: www.Styledevelopments.com.au
ARCHITECTURAL DESIGN | ENGINEERING
CONSTRUCTION | PROJECT MANAGEMENT

styledevelopments
DESIGN | PROJECT MANAGEMENT | PROPERTY DEVELOPMENT | CONSTRUCTION

PROJECT: PROPOSED GREENSPOT RESOURCE RECOVERY AND RECYCLING FACILITY 24 DAVIS ROAD WETHERILL PARK NSW 2164			PROJECT NO. 1521
CLIENT: BETTERGROW			SCALE 1: 100
TITLE: FOOD DEPACKAGING AND PROCESS BUILDING FLOOR PLAN	JOB NO. 0604– 16	SHEET NO. C03	ISSUE A

A1 SHEET

Appendix B

DPI Registered Groundwater Bores

NSW Office of Water

Work Summary

GW103822

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:	Auger		
Owner Type:			
Commenced Date:		Final Depth:	9.00 m
Completion Date:	30/01/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	100			Auger
1	1	Casing	P.V.C.	-0.30	9.00	50			
1	1	Opening	Screen	6.00	9.00	50		1	PVC

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103822 ***

NSW Office of Water

Work Summary

GW103823

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:	Auger		
Owner Type:			
Commenced Date:		Final Depth:	15.00 m
Completion Date:	31/05/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	15.00	100			Auger
1	1	Casing	P.V.C.	-0.30	15.00	50			
1	1	Opening	Screen	12.00	15.00	50		1	PVC

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103823 ***

NSW Office of Water

Work Summary

GW103824

Licence:	10BL156668	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	15.00 m
Completion Date:	31/05/1993	Drilled Depth:	
Contractor Name:	ENGINEERING EXPLORATIONS PTY LTD		
Driller:			
Assistant Driller:			
Property:	CAMIDE 153 NEWTOWN RD WETHERILL PARK 2165	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	1//202788
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 1//202788

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253720.0	Latitude:	33°50'20.0"S
Elevation Source:	Unknown	Easting:	305502.0	Longitude:	150°53'52.8"E
GS Map:	-	MGA Zone:	0	Coordinate	Unknown

Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	15.00	100			Auger
1	1	Casing	P.V.C.	-0.30	15.00	50			
1	1	Opening	Screen	0.00	15.00	50		1	PVC

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW103824 ***

NSW Office of Water

Work Summary

GW111392

Licence:	10BL604252	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	6.00 m
Completion Date:	06/10/2010	Drilled Depth:	6.00 m
Contractor Name:			
Driller:	Stoffer De Haan		
Assistant Driller:			
Property:	LEND LEASE REAL ESTATE INV 29C DAVIS ROAD WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
		County	Parish	Cadastre	
	Form A:	CUMBE	CUMBE.41	100//864960	
	Licensed:				
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6254139.0	Latitude:	33°50'06.8"S
Elevation Source:	Unknown	Easting:	306098.0	Longitude:	150°54'16.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	50			Auger - Solid Flight
1		Backfill	Bentonite	1.00	3.00				
1		Annulus	Waterworn/Rounded	3.00	6.00				Graded
1	1	Casing	Pvc Class 9	0.00	3.00	50	46		Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	50		1	Casing - Machine Slotted, PVC Class 9, Screwed, SL: 150.0mm, A: 0.20mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	FILL	Fill	
1.00	3.50	2.50	CLAY,RED BROWN,FIRM	Clay	
3.50	4.00	0.50	SAND,CLAYEY	Sand	
4.00	5.00	1.00	CLAY GRAVELLY,BROWN	Clay	
5.00	6.00	1.00	CLAY AND SHALE INTERBEDDED	Clay	

Remarks

*** End of GW111392 ***

NSW Office of Water

Work Summary

GW105474

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.30 m
Completion Date:	10/06/2003	Drilled Depth:	9.30 m
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253415.0	Latitude:	33°50'30.6"S
Elevation Source:	Unknown	Easting:	306574.0	Longitude:	150°54'34.2"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.30	100			Unknown

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	9.30	9.30	SHALE, BROWN	Shale	

Remarks

*** End of GW105474 ***

NSW Office of Water

Work Summary

GW105475

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.50 m
Completion Date:	10/06/2003	Drilled Depth:	9.50 m
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253513.0	Latitude:	33°50'27.4"S
Elevation Source:	Unknown	Easting:	306541.0	Longitude:	150°54'33.0"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.50	100			Unknown

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	9.50	9.50	SHALE, BROWN	Shale	

Remarks

*** End of GW105475 ***

NSW Office of Water

Work Summary

GW105476

Licence:	10BL162423	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		Final Depth:	9.50 m
Completion Date:	10/06/2003	Drilled Depth:	
Contractor Name:			
Driller:			
Assistant Driller:			
Property:	SOUTHCORP 39-41 FRANK ST WETHERILL PARK 2164	Standing Water Level:	
GWMA:	-	Salinity:	
GW Zone:	-	Yield:	

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	2 770614
Licensed:	CUMBERLAND	ST LUKE	Whole Lot 2//770614

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253658.0	Latitude:	33°50'22.7"S
Elevation Source:	Unknown	Easting:	306592.0	Longitude:	150°54'35.1"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	9.50	100			Unknown

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

*** End of GW105476 ***

NSW Office of Water

Work Summary

GW109317

Licence:	10BL602582	Licence Status:	CANCELLED
		Authorised Purpose(s):	TEST BORE
		Intended Purpose(s):	TEST BORE
Work Type:	Bore		
Work Status:	Test Hole		
Construct.Method:	Rotary Air		
Owner Type:	Private		
Commenced Date:		Final Depth:	165.00 m
Completion Date:	09/09/2008	Drilled Depth:	165.00 m
Contractor Name:	INTERTEC DRILLING SERVICES		
Driller:	William Crump		
Assistant Driller:			
Property:	BORAL RESOURCES (NSW) PTY LTD LOT 2 HASSALL STREET WETHERILL PARK 2164 NSW	Standing Water Level:	19.000
GWMA:		Salinity:	
GW Zone:		Yield:	2.100

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.41	2//1038293
Licensed:			

Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6254729.0	Latitude:	33°49'48.1"S
Elevation Source:	Unknown	Easting:	306717.0	Longitude:	150°54'40.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	1.50	305			Rotary Air
1		Hole	Hole	1.50	17.30	245			Rotary Air
1		Hole	Hole	17.30	165.00	157			Down Hole Hammer
1	1	Casing	Pvc Class 9	-0.40	47.60	140			Suspended in Clamps, Screwed and Glued
1	1	Casing	Steel	-0.40	19.10	157	147		Driven into Hole, Welded

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
53.00	54.00	1.00	Unknown			0.45			6050.00
101.50	101.60	0.10	Unknown			0.15			6150.00
127.10	127.20	0.10	Unknown			0.70			10000.00
163.80	163.90	0.10	Unknown	19.00		2.10			10000.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	FILL	Fill	
1.50	10.00	8.50	SANDY CLAY,HARD BANDS OF ROCKS	Sandy Clay	
10.00	12.00	2.00	BROWN SHALE	Breccia	
12.00	15.00	3.00	SHALE V/SOFT	Shale	
15.00	37.50	22.50	SHALE GREY	Shale	
37.50	41.00	3.50	SILT,SANDSTONE HARD	Silt	
41.00	53.00	12.00	SANDSTONE V/HARD	Sandstone	
53.00	54.00	1.00	SILTS,SANDSTONE LIGHTLY FACTURED	Siltstone	
54.00	62.00	8.00	SILTS HARD	Siltstone	
62.00	64.00	2.00	SHALE HARD	Shale	
64.00	81.00	17.00	SILTS HARD	Siltstone	
81.00	101.50	20.50	SHALE, BLACK, HARD	Shale	
101.50	101.60	0.10	SHALE, FRACTURED	Shale	
101.60	127.10	25.50	SANDSTONE GREY	Sandstone	
127.10	127.20	0.10	SANDSTONE FRACTURED	Sandstone	
127.20	135.00	7.80	SANDSTONE GREY	Sandstone	
135.00	135.40	0.40	SANDSTONE F/QUARTZ	Sandstone	
135.40	163.80	28.40	SANDSTONE GREY	Sandstone	
163.80	163.90	0.10	SANDSTONE FRACTURED	Sandstone	
163.90	165.00	1.10	SANDSTONE GREY	Sandstone	

Remarks

*** End of GW109317 ***

NSW Office of Water

Work Summary

GW110063

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:			
Owner Type:	Private		
Commenced Date:		Final Depth:	5.00 m
Completion Date:	09/01/2006	Drilled Depth:	5.00 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253105.0	Latitude:	33°50'39.9"S
Elevation Source:	Unknown	Easting:	305413.0	Longitude:	150°53'48.8"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.00	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL, CRUSHED ROCK,SHALE,SANDSTONE,SOME CLAY,BROWN	Fill	
0.40	3.50	3.10	SILTY CLAY,BROWN,PLASTIC,FIRM HOMOGENOUS,MOIST	Silty Clay	
3.50	4.50	1.00	MATERIAL BECOMING VERY HARD,NO ODOUR	Mafic	
4.50	5.00	0.50	WEATHERED SHALE,CLAY,BROWN,SOME GREY WEAT.SHALE,GREY,	Unknown	

Remarks

*** End of GW110063 ***

NSW Office of Water

Work Summary

GW110064

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:			
Owner Type:	Private		
Commenced Date:		Final Depth:	1.10 m
Completion Date:	10/01/2006	Drilled Depth:	1.10 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253129.0	Latitude:	33°50'39.2"S
Elevation Source:	Unknown	Easting:	305472.0	Longitude:	150°53'51.1"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	1.10	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.10	1.10	FILL,GRAVEL,LOAM,SAND,SOME CLAY BROWN,FIRM,MOIST	Fill	

Remarks

*** End of GW110064 ***

NSW Office of Water

Work Summary

GW110065

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Well

Work Status:

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 4.90 m

Completion Date: 09/01/2006 Drilled Depth: 4.90 m

Contractor Name: Macquarie Drilling

Driller: Dino Parisotto

Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast

CMA Map:

River Basin: - Unknown

Grid Zone:

Scale:

Area/District:

Elevation: 0.00 m (A.H.D.)

Northing: 6253226.0

Latitude: 33°50'36.0"S

Elevation Source: Unknown

Easting: 305422.0

Longitude: 150°53'49.3"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.90	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.60	0.60	FILL,SANDY LOAM,BROWN,SOME GRAVEL AND ROCK	Fill	
0.60	1.50	0.90	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
1.50	3.50	2.00	MATERIAL BECOMING VERY HARD,L/BROWN GREY	Mafic	
3.50	4.90	1.40	SOME IRONSTONE GRAVEL,L/BROWN,WEATHERED SHALE,CLAY BROWN	Soil	

Remarks

*** End of GW110065 ***

NSW Office of Water

Work Summary

GW110066

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	4.20 m
Completion Date:	09/01/2006	Drilled Depth:	4.20 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253172.0	Latitude:	33°50'37.7"S
Elevation Source:	Unknown	Easting:	305346.0	Longitude:	150°53'46.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.20	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,SANDY GRAVEL AND LOAM,BROWN,LOOSE,ROCK FRAGS.DRY	Fill	
0.40	1.50	1.10	SILTY CLAY BROWN,PLASTIC,FIRM HOMOGENOUS,DRY	Silty Clay	
1.50	3.60	2.10	MATERIAL BECOMING VERY HARD,L/BROWN,GREY	Mafic	
3.60	3.70	0.10	SOME IRONSTONE GRAVEL IN CLAY L/BROWN,MOIST	Soil	
3.70	4.20	0.50	WEATHERED SHALE,CLAY,BROWN HARD MOIST	Unknown	

Remarks

*** End of GW110066 ***

NSW Office of Water
Work Summary

GW110067

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date: Final Depth: 4.20 m
Completion Date: 09/01/2006 Drilled Depth: 4.20 m

Contractor Name: Macquarie Drilling
Driller: Dino Parisotto
Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW
Standing Water Level:
GWMA: Salinity:
GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6253199.0
Easting: 305341.0
Latitude: 33°50'36.8"S
Longitude: 150°53'46.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.20	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	FILL,(ALLUVIUM) SANDY GRAVEL AND LOAM LOOSE,DRY,BROWN	Fill	
0.50	3.50	3.00	SANDY SILT,BROWN,SPECS,WHITE MEDIUM BROWN,DRY	Sandy Siltstone	
3.50	4.20	0.70	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST,IRONS./GRAVEL	Silcrete	

Remarks

*** End of GW110067 ***

NSW Office of Water
Work Summary

GW110068

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date: Final Depth: 5.00 m
Completion Date: 10/01/2006 Drilled Depth: 5.00 m

Contractor Name: Macquarie Drilling
Driller: Dino Parisotto
Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW
Standing Water Level:
GWMA: Salinity:
GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6253139.0
Easting: 305332.0
Latitude: 33°50'38.7"S
Longitude: 150°53'45.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.00	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	SANDY SILT (ALLUVIUM) BROWN,WHITE GRAVEL,LOOSE,DRY	Sandy Siltstone	
1.50	3.00	1.50	SILTY CLAY BROWN,PLASTIC,FIRM, HOMOGENOUS,MOIST	Silty Clay	
3.00	4.40	1.40	MATERIAL BECOMING FIRM,TRACE OF GRIT,L/BROWN,GREY	Mafic	
4.40	5.00	0.60	WEATHERED SHALE,CLAY,BROWN,FIRM,BROWN-GREY,MOIST	Unknown	

Remarks

*** End of GW110068 ***

NSW Office of Water

Work Summary

GW110069

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	3.90 m
Completion Date:	10/01/2006	Drilled Depth:	3.90 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253174.0	Latitude:	33°50'37.6"S
Elevation Source:	Unknown	Easting:	305319.0	Longitude:	150°53'45.2"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	3.90	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,CRUSHED ROCK-SHALE,SANDSTONE,SOME CLAY BROWN	Fill	
0.40	3.00	2.60	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
3.00	3.80	0.80	MOIST,LIGHT BROWN SILTY CLAY,WET,MUDDY	Monzonite	
3.80	3.90	0.10	WEATHERED SHALE,CLAY,BROWN	Unknown	

Remarks

*** End of GW110069 ***

NSW Office of Water
Work Summary

GW110070

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date: Final Depth: 5.10 m
Completion Date: 21/04/2009 Drilled Depth: 5.10 m

Contractor Name: Macquarie Drilling
Driller: Dino Parisotto
Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW
Standing Water Level:
GWMA: Salinity:
GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6253151.0
Easting: 305309.0
Latitude: 33°50'38.3"S
Longitude: 150°53'44.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.10	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	FILL,CRUSHED ROCK SHALE,SANDSTONE AND SOME CLAY, BROWN	Fill	
0.40	1.30	0.90	SANDY SILT (ALLUVIUM) BROWN,LOOSE,GRAVEL, DRY	Sandy Siltstone	
1.30	4.00	2.70	SILTY CLAY,BROWN,PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
4.00	5.10	1.10	WEATHERED SHALE.CLAY,BROWN,HARD AND SOFT SECTIONS,MUDDY.	Unknown	

Remarks

*** End of GW110070 ***

NSW Office of Water

Work Summary

GW110071

Licence:	10BL600169	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Well		
Work Status:			
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.10 m
Completion Date:	10/01/2006	Drilled Depth:	5.10 m
Contractor Name:	Macquarie Drilling		
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	13//1038351
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253217.0	Latitude:	33°50'36.2"S
Elevation Source:	Unknown	Easting:	305368.0	Longitude:	150°53'47.2"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.10	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	FILL, CRUSHED ROCK-SHALE,SANDSTONE AND SOME CLAY.BROWN	Fill	
0.20	3.00	2.80	SANDY SILT,(ALLUVIUM) BROWN,LOOSE GRAVEL,LOOSE,DRY	Sandy Siltstone	
3.00	3.90	0.90	SILTY CLAY,BROWN,PLASTIC,FIRM, HOMOGENOUS,MOIST	Silty Clay	
3.90	5.10	1.20	WEATHERED SHALE/CLAY,BROWN,HARD AND SOFT SECTIONS,MUDDY	Unknown	

Remarks

*** End of GW110071 ***

NSW Office of Water
Work Summary

GW110072

Licence: 10BL600169 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date: Final Depth: 4.00 m
Completion Date: 10/01/2006 Drilled Depth: 4.00 m

Contractor Name: Macquarie Drilling
Driller: Unkown Unknown
Assistant Driller:

Property: BOC OPERATIONS 428-440 VICTORIA ST WETHERILL PARK 2164 NSW
Standing Water Level:
GWMA: Salinity:
GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.50	13//1038351
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Grid Zone:
Scale:
Area/District:

Elevation: 0.00 m (A.H.D.)
Northing: 6253200.0
Latitude: 33°50'36.8"S
Elevation Source: Unknown
Easting: 305436.0
Longitude: 150°53'49.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	4.00	125			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.10	0.10	FILL,CRUSHED ROCK,SHALE,SANDSTONE	Fill	
0.10	1.50	1.40	SILTY CLAY,BROWN PLASTIC,FIRM,HOMOGENOUS,MOIST	Silty Clay	
1.50	2.60	1.10	MATERIAL BECOMING VERY HARD	Mafic	
2.60	3.80	1.20	MINOR STONE GRAVEL	Mica	
3.80	4.00	0.20	WEATHERED SHALE/CLAY,BROWN,HARD,MOIST.	Unknown	

Remarks

*** End of GW110072 ***

NSW Office of Water

Work Summary

GW111391

Licence: 10BL604252 Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE

Intended Purpose(s): MONITORING BORE

Work Type: Bore

Work Status: Equipped

Construct.Method: Auger - Solid Flight

Owner Type: Private

Commenced Date: Final Depth: 6.00 m

Completion Date: 06/10/2010 Drilled Depth: 6.00 m

Contractor Name:

Driller: Stoffer De Haan

Assistant Driller:

Property: LEND LEASE REAL ESTATE INV 29C DAVIS ROAD WETHERILL PARK 2164 NSW

Standing Water Level:

GWMA: Salinity:

GW Zone: Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.41	100//864960
Licensed:			

Region: 10 - Sydney South Coast

CMA Map:

River Basin: - Unknown

Grid Zone:

Scale:

Area/District:

Elevation: 0.00 m (A.H.D.)

Northing: 6254190.0

Latitude: 33°50'05.3"S

Elevation Source: Unknown

Easting: 306291.0

Longitude: 150°54'23.8"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.00	50			Auger - Solid Flight
1		Backfill	Bentonite	2.00	3.00				
1		Annulus	Waterworn/Rounded	3.00	6.00				Graded
1	1	Casing	Pvc Class 9	0.00	3.00	50	46		Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	50		1	Casing - Machine Slotted, PVC Class 9, Screwed, SL: 150.0mm, A: 0.20mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.40	1.40	FILL	Fill	
1.40	1.90	0.50	GRAVELLY CLAY ,BROWN	Clay	
1.90	3.50	1.60	CLAY,ORANGE,BROWN	Clay	
3.50	6.00	2.50	CLAY,BROWN,FIRM	Clay	

Remarks

*** End of GW111391 ***

NSW Office of Water

Work Summary

GW111878

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.50 m
Completion Date:	23/04/2009	Drilled Depth:	5.50 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:				
		County	Parish	Cadastre
	Form A:	CUMBE	CUMBE.50	31//589097
	Licensed:			
Region:	10 - Sydney South Coast	CMA Map:		
River Basin:	- Unknown	Grid Zone:	Scale:	
Area/District:				
Elevation:	0.00 m (A.H.D.)	Northing:	6253631.0	Latitude: 33°50'23.6"S
Elevation Source:	Unknown	Easting:	306521.0	Longitude: 150°54'32.3"E
GS Map:	-	MGA Zone:	0	Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.50	95			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	FILL,DARK BROWN	Fill	
0.20	0.50	0.30	SILTY CLAY,RD/BROWN	Silty Clay	
0.50	0.70	0.20	SILTY CLAY,DARK BROWN	Silty Clay	
0.70	2.00	1.30	SILTY CLAY PALE BROWN/YELLOW	Silty Clay	
2.00	3.00	1.00	CLAY GREY STIFF,DENSE	Clay	
3.00	5.00	2.00	SHALE/CLAY,WEATHERED BEDROCK,FREY	Shale	
5.00	5.50	0.50	BEDROCK SHALE,VERY HARD	Bedrock	

Remarks

*** End of GW111878 ***

NSW Office of Water

Work Summary

GW111879

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	5.80 m
Completion Date:	23/04/2009	Drilled Depth:	5.70 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	31//589097
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253631.0	Latitude:	33°50'23.5"S
Elevation Source:	Unknown	Easting:	306472.0	Longitude:	150°54'30.4"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	5.80	95			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	FILL,SAND PALE YELLOW/BROWN	Fill	
0.30	0.50	0.20	SILTY CLAY,PALE BROWN,WITH MINOR GREY,PLASTIC	Silty Clay	
0.50	0.70	0.20	IRONSTONE LAYER,DARK RED,DRY	Ironstone	
0.70	2.00	1.30	SILTY CLAY,PALE BROWN,PLASTIC	Silty Clay	
2.00	3.00	1.00	BEDROCK WEATHERED,GREY,VERY HARAD	Bedrock	
3.00	4.50	1.50	BEDROCK,SHALE,MEDIUM BROWN AND GREY	Shale	
4.50	5.70	1.20	BEDROCK SHALE,VERY HARD	Shale	

Remarks

*** End of GW111879 ***

NSW Office of Water

Work Summary

GW111880

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	6.20 m
Completion Date:	23/04/2009	Drilled Depth:	6.20 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:					
			County	Parish	Cadastre
		Form A:	CUMBE	CUMBE.50	31//589097
		Licensed:			
Region:	10 - Sydney South Coast	CMA Map:			
River Basin:	- Unknown	Grid Zone:		Scale:	
Area/District:					
Elevation:	0.00 m (A.H.D.)	Northing:	6253462.0	Latitude:	33°50'29.0"S
Elevation Source:	Unknown	Easting:	306500.0	Longitude:	150°54'31.4"E
GS Map:	-	MGA Zone:	0	Coordinate Source:	Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.20	95			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.70	0.70	SILTY CLAY PALE BROWN	Silty Clay	
0.70	1.20	0.50	SILTY CLAY,GREY	Silty Clay	
1.20	2.00	0.80	BEDROCK WEATHERED,SILTY CLAY PURPLE/BROWN	Bedrock	
2.00	6.20	4.20	BEDROCK,CLAY,BROWN	Bedrock	

Remarks

*** End of GW111880 ***

NSW Office of Water

Work Summary

GW111881

Licence:	10BL603326	Licence Status:	ACTIVE
		Authorised Purpose(s):	MONITORING BORE
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:	Auger - Solid Flight		
Owner Type:	Private		
Commenced Date:		Final Depth:	6.50 m
Completion Date:	27/04/2009	Drilled Depth:	6.50 m
Contractor Name:			
Driller:	Dino Parisotto		
Assistant Driller:			
Property:	SIMSMETAL HOLDINGS 35 - 37 FRANK ST WETHERILL PARK 2164 NSW	Standing Water Level:	
GWMA:		Salinity:	
GW Zone:		Yield:	

Site Details

Site Chosen By:				
		County	Parish	Cadastre
	Form A:	CUMBE	CUMBE.50	31//589097
	Licensed:			
Region:	10 - Sydney South Coast	CMA Map:		
River Basin:	- Unknown	Grid Zone:	Scale:	
Area/District:				
Elevation:	0.00 m (A.H.D.)	Northing:	6253678.0	Latitude: 33°50'22.0"S
Elevation Source:	Unknown	Easting:	306482.0	Longitude: 150°54'30.9"E
GS Map:	-	MGA Zone:	0	Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From	To	Outside	Inside	Interval	Details

				(m)	(m)	Diameter (mm)	Diameter (mm)		
1		Hole	Hole	0.00	6.50	95			Auger - Solid Flight

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

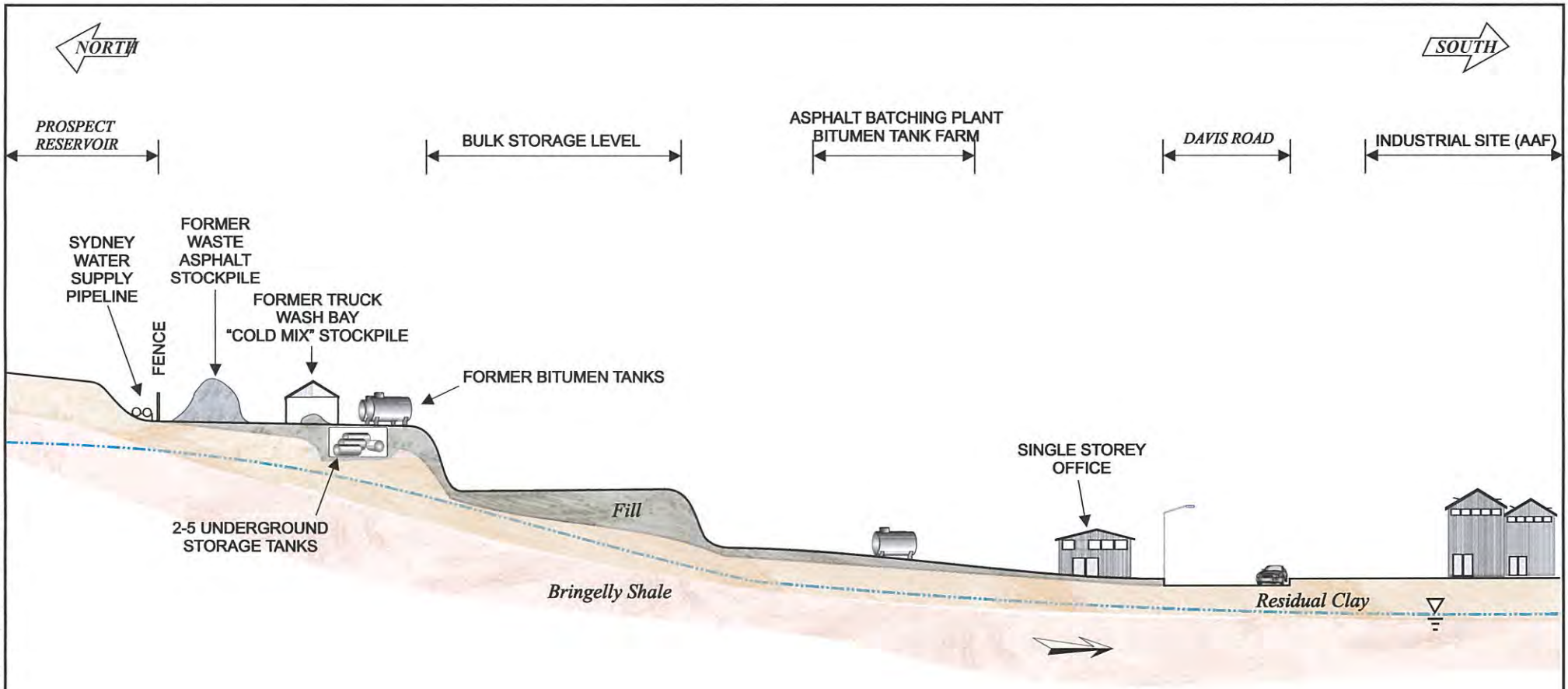
From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	FILL,SILTY LOAM,MINOR SILTY CLAY	Fill	
0.50	1.20	0.70	FILL,NO SILTY CLAY	Fill	
1.20	2.00	0.80	SILTY CLAY,RED/BROWN,PLASTIC,FIRM	Silty Clay	
2.00	3.00	1.00	SILTY CLAY,RED/BROWN,STIFF,NO ODOUR	Silty Clay	
3.00	5.00	2.00	BEDROCK WEATHERED,SILTY CLAY,LILGHT M/BROWN	Silty Clay	
5.00	6.50	1.50	BEDROCK,SHALE,SILTY CLAY,BROWN/GREY	Shale	

Remarks

*** End of GW111881 ***

Appendix C

Extracts from Previous Reports

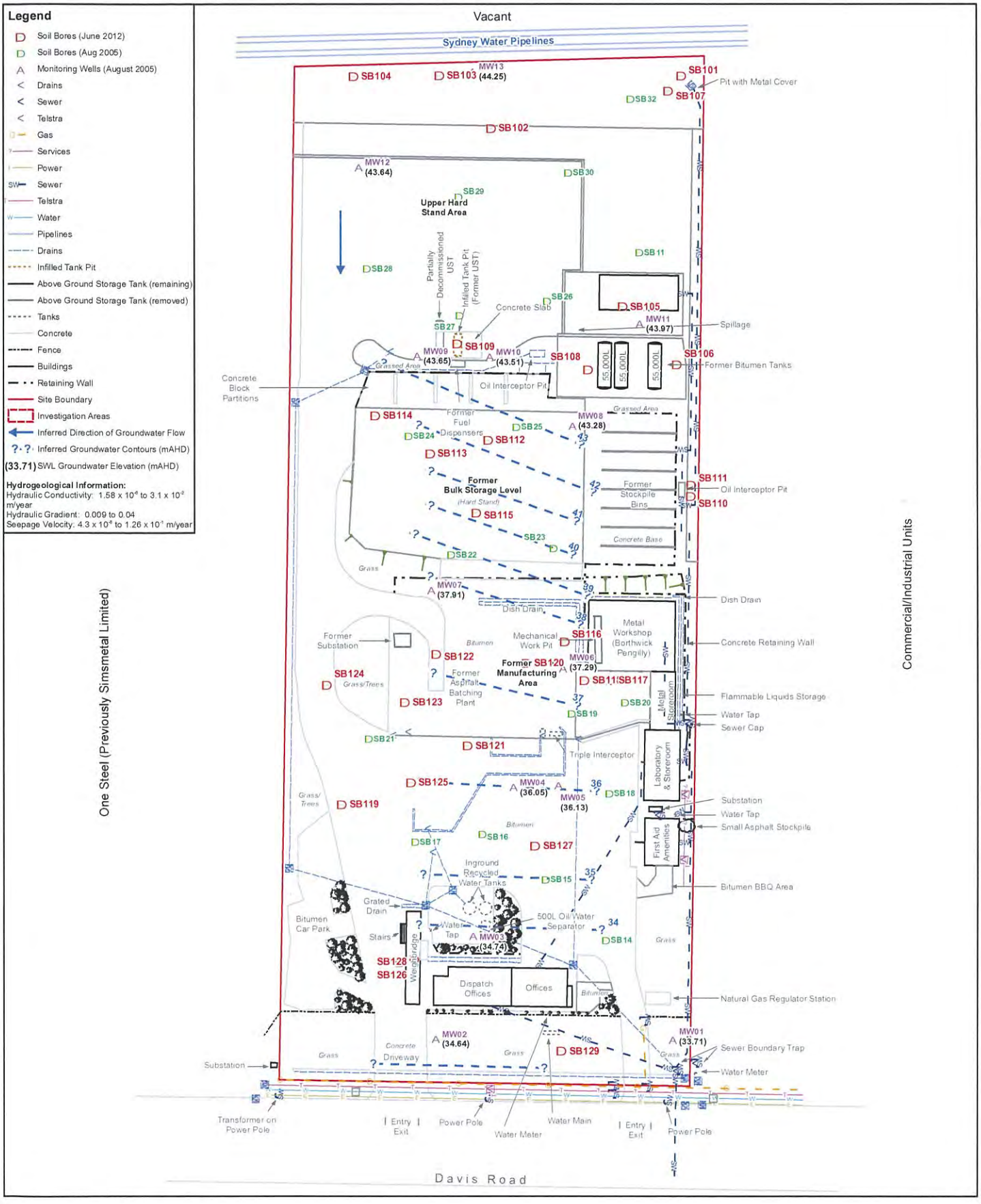


LEGEND

INFERRED GROUNDWATER LEVEL

INFERRED DIRECTION OF GROUNDWATER FLOW

CLIENT: MOBIL OIL AUSTRALIA PTY LTD PROJECT: ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW				TITLE: SITE CONCEPTUAL MODEL	
NOT TO SCALE	DESIGNED: KY DRAWN: BB DATE: 25/11/08	APPROVED: NR DATE: 25/11/08 STATUS: DRAFT	PROJECT: 42424135 CAD FILE: 006.CDR REVISION: A	URS	FIGURE: 6



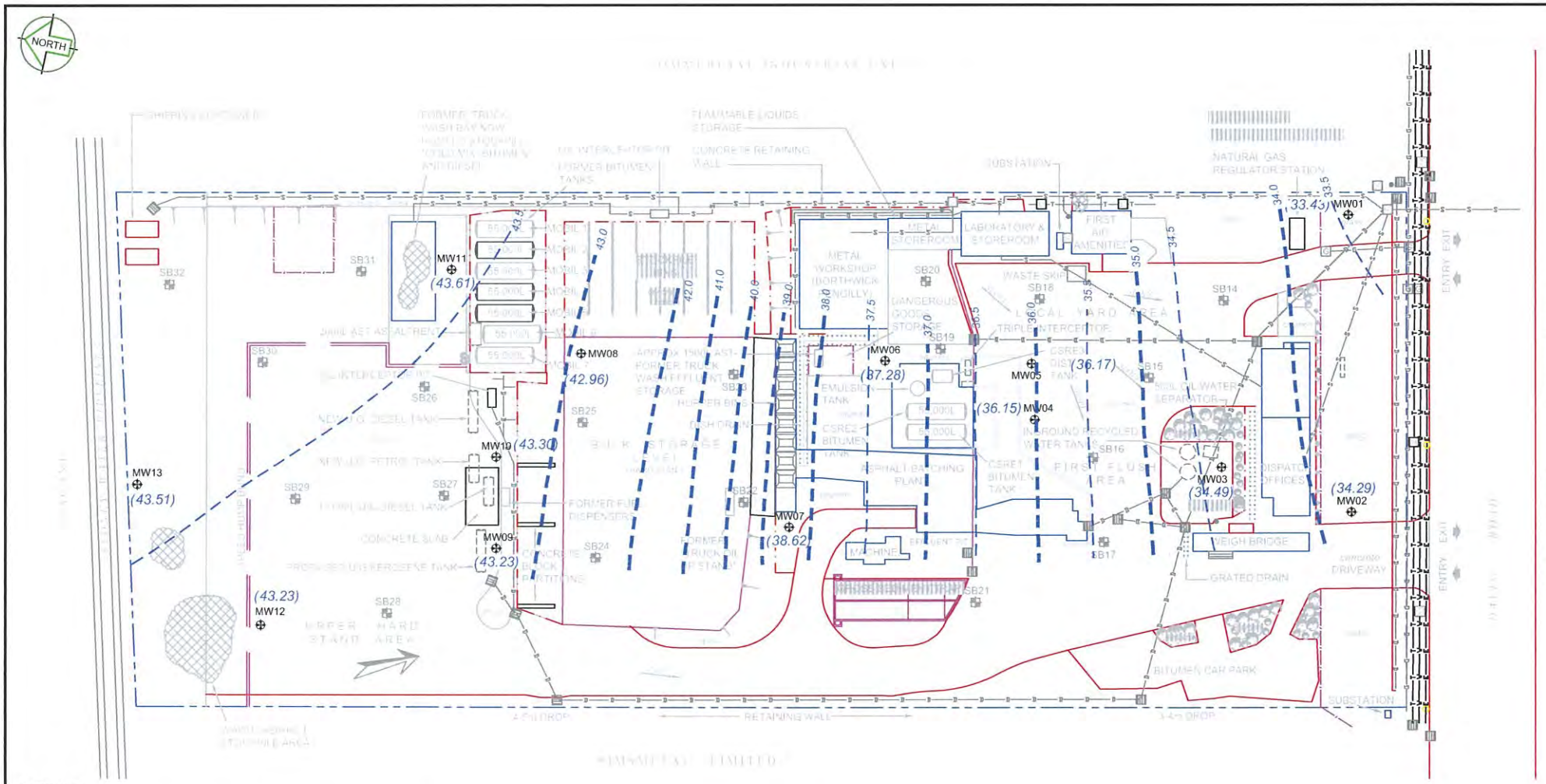
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING,
FORMER WETHERILL PARK EMOLEUM DEPOT

INFERRED CORRECTED GROUNDWATER MAP

URS | 24 DAVIS ROAD, WETHERILL PARK, NSW | Figure: 6

File No: 42424444.003.mxd | Drawn: STB | Approved: MF | Date: 07/08/2012 | Rev. A | A3



LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 SOIL BORE (URS AUG 2005)
- MW11 MONITORING WELL (URS AUG 2005)
- GAS LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- STORMWATER DRAIN
- TELSTRA
- TOWN WATER
- 34.0 / 34.5 INFERRED GROUNDWATER CONTOURS (1.0m & 0.5m contour interval) (mAHD)
- (34.32) STANDING WATER LEVELS (mAHD)

HYDROLOGICAL INFORMATION

HYDRAULIC CONDUCTIVITY = 8.64×10^{-7} to 1.2×10^{-3} m/day
HYDRAULIC GRADIENT = 0.03 ~ 0.10
SEEPAGE VELOCITY = 9.5×10^{-4} to 0.13 m/year

CLIENT: MOBIL AUSTRALIA PTY LTD

PROJECT: ANNUAL GME - MARCH 2010, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE: GROUNDWATER GRADIENT MAP

A3

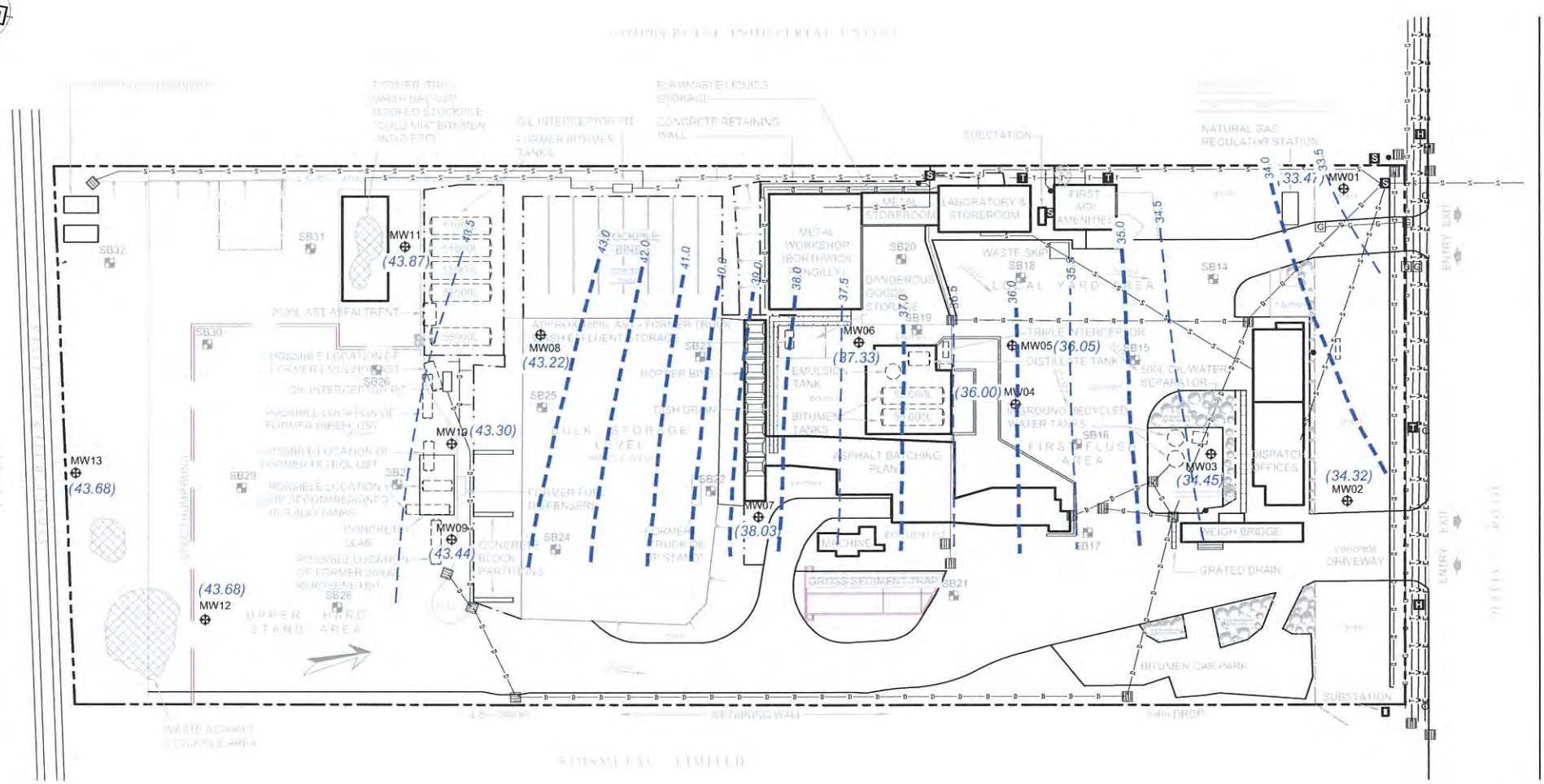
0 20 40
1:750 (metres)

DESIGNED: KY | APPROVED: NR
DRAWN: BB | DATE: 08/04/2010
DATE: 08/04/2010 | STATUS: DRAFT

PROJECT: 42424273
CAD FILE: 004.DWG
REVISION: A

URS

FIGURE 4



LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- H — HYDRANT/WATER PIT
- G — GAS PIT
- S — SEWER PIT
- T — TELSTRA PIT
- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- GAS LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- STORMWATER DRAIN
- TELSTRA
- TOWN WATER
- 34.0 / 34.5 — INFERRED GROUNDWATER CONTOURS (1.0m & 0.5m contour interval) (mAHD)
- (34.32) — STANDING WATER LEVELS (mAHD)

HYDROLOGICAL INFORMATION

HYDRAULIC CONDUCTIVITY = 1×10^{-11} to 1.4×10^{-8} m/year
HYDRAULIC GRADIENT = 0.06
SEEPAGE VELOCITY = 5.3×10^{-5} to 2.7 m/year

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

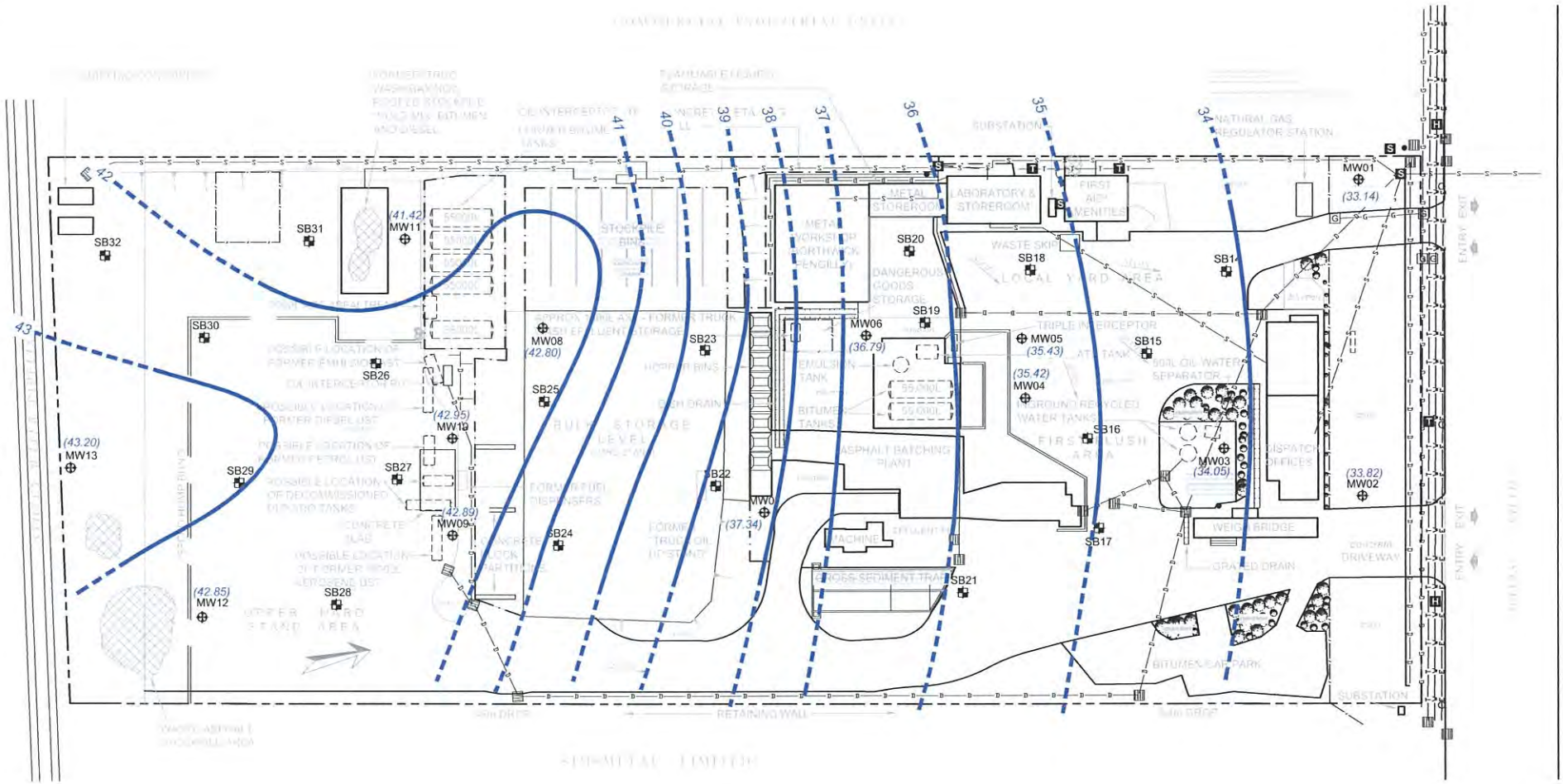
TITLE: **GROUNDWATER GRADIENT MAP**

A3

0 20 40
1:750 (metres)

DESIGNED: KY	APPROVED: NR	PROJECT: 42424135	FIGURE 4
DRAWN: BB	DATE: 25/11/08	CAD FILE: 004.DWG	
DATE: 25/11/08	STATUS: DRAFT	REVISION: A	

URS



LEGEND

- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- STORMWATER DRAIN
- TOWN WATER
- GAS LINE
- TELSTRA LINE
- OVERHEAD ELECTRICITY
- SEWER LINE
- UNDERGROUND STORAGE TANK
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE

- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- H — HYDRANT/WATER PIT
- G — GAS PIT
- S — SEWER PIT
- T — TELSTRA PIT
- STORMWATER DRAIN
- WATER TAP OR METER
- STAINING AREA
- STOCKPILE AREA
- INFERRED DIRECTION OF GROUNDWATER FLOW

- 41 — INFERRED GROUNDWATER CONTOURS (mAHD)
- 41 — INFERRED GROUNDWATER CONTOURS (EXACT LOCATION UNSURE) (mAHD)
- (35.42) — SWL GROUNDWATER ELEVATION (mAHD)
- (-) — UNABLE TO COLLECT DATA

HYDROGEOLOGICAL INFORMATION:

HYDRAULIC CONDUCTIVITY: $1x10^{-6}$ to $1x10^{-2}$ m/year
HYDRAULIC GRADIENT: 0.001 - 0.116
SEEPAGE VELOCITY: $1x10^{-7}$ to 0.00035m/year

DATE DATA COLLECTED: 18/8/05 *MW13 GAUGED ON 28/5/05

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

TITLE: **GROUNDWATER GRADIENT MAP**

A3

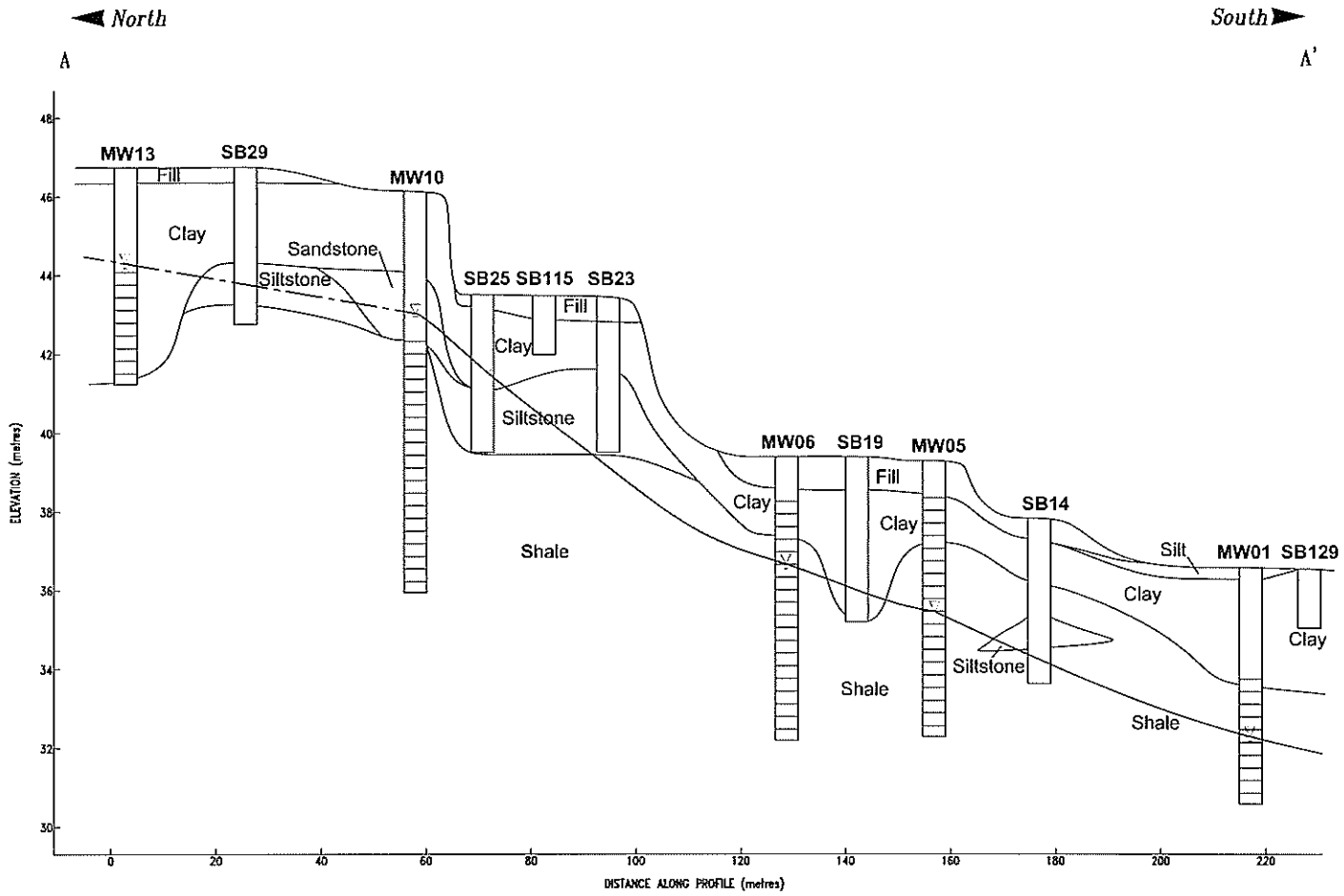
0 20 40
1:750 (metres)

DESIGNED: GVS | APPROVED:
DRAWN: TB | DATE:
DATE: 15/09/05 | STATUS: FINAL

PROJECT: 42423822
CAD FILE: 005.DWG
REVISION: A

URS

FIGURE 5



DESIGNED:	GVS	APPROVED:	
DRAWN:	AB	DATE:	
DATE:	08/08/12	STATUS:	FINAL

PROJECT: 42424444
CAD FILE: 005a.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05
20/06/12 to 25/07/12
25/06/12 to 27/06/12

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

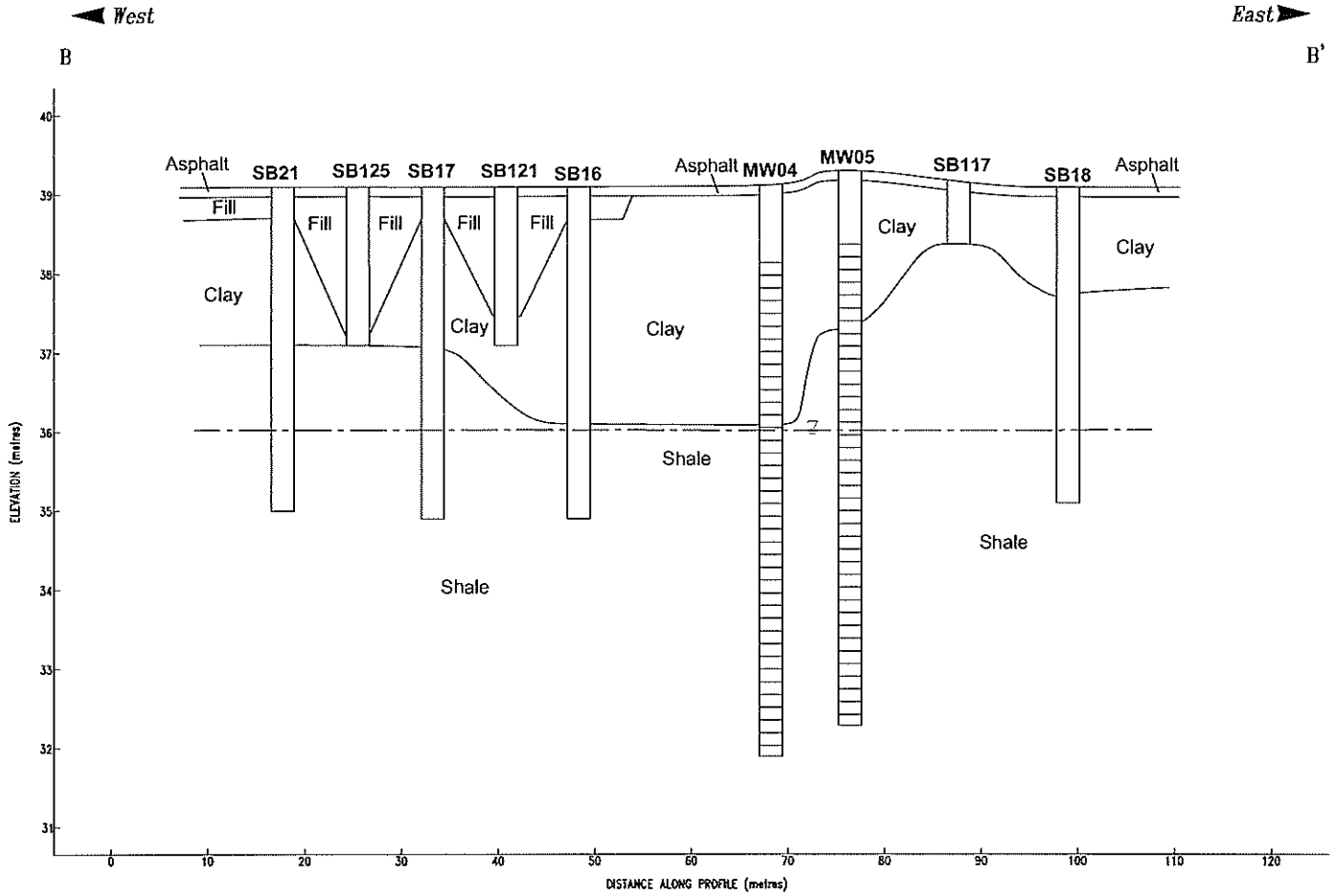
PROJECT
WETHERILL PARK TEST PITTING
FORMER WETHERILL PARK EMOLEUM DEPOT

TITLE
GEOLOGICAL CROSS SECTION A-A'

A3

URS

FIGURE 5a



DESIGNED:	GVS	APPROVED:	
DRAWN:	AB	DATE:	
DATE:	08/08/12	STATUS:	FINAL
PROJECT:	42424444		
CAD FILE:	005b.DWG		
REVISION:	A		

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 26/8/12
19/06/12 to 21/06/12
25/06/12 to 27/06/12

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

PROJECT
WETHERILL PARK TEST PITTING
FORMER WETHERILL PARK EMOLEUM DEPOT

TITLE
GEOLOGICAL CROSS SECTION B-B'

A3

URS

FIGURE
5b

Location	MW13_0.1-0.2	MW13_4.0-4.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	70	< 50
C15-C28 fraction	1640	< 100
C29-C36 fraction	1160	< 100
C10-C36 fraction	4070	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	6	12

Location	SB29_0.1-0.2	SB29_2.9-3.0	QC105	QC205 22.7.05	SB29_3.5-4.0
C6-C9 fraction	< 2	< 2	< 2	< 5	< 2
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 50	< 100
C29-C36 fraction	< 100	240	270	100	< 100
C10-C36 fraction	-	240	270	100	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 1	< 0.2
Total Xylene	-	-	-	-	-
Lead-5	< 5	9	10	9	11

Location	SB25_0.1-0.2	SB25_1.5-2.0	SB25_3.5-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	420	< 100	< 100
C29-C36 fraction	560	< 100	< 100
C10-C36 fraction	980	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	< 5	15	12

Location	SB23_1.0-1.1	SB23_1.9-2.0	SB23_3.9-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	18	19	15

Location	MW05_1.0-1.1	MW05_2.0-2.2	MW05_5.0-5.2
C6-C9 fraction	< 2	3	2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	500	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	500	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	0.2	-
Lead	20	12	14

Location	MW10_0.5-0.6	MW10_4.0-4.2	MW10_7.0-7.2	QC106	QC206
C6-C9 fraction	< 2	< 2	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100	< 100	< 100
C10-C36 fraction	-	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-	-	-
Lead	12	10	16	13	15

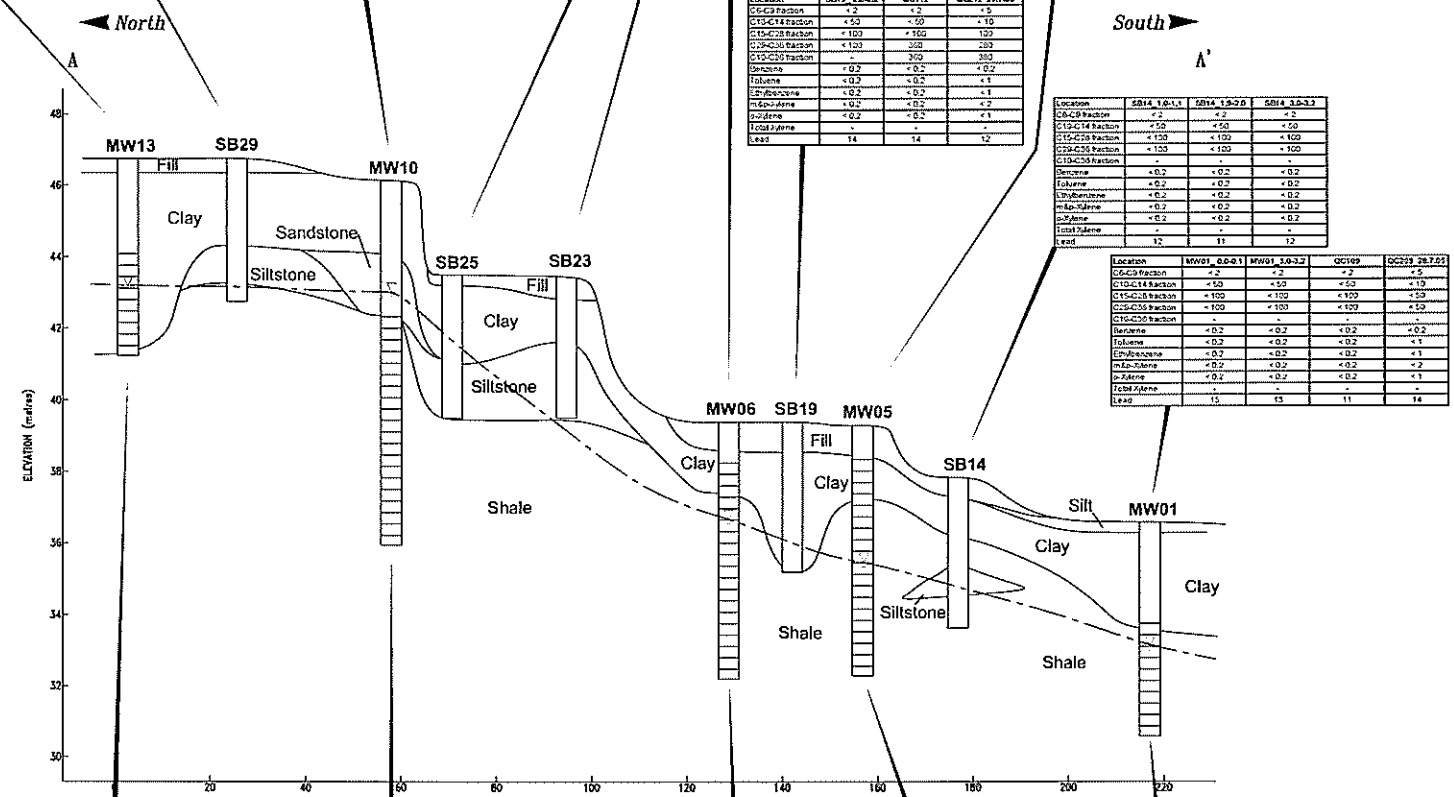
Location	MW06_2.0-2.2	MW06_4.0-4.2	MW06_6.5-6.6
C6-C9 fraction	10	6	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	0.6	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	11	13	16

Location	SB19_2.0-2.2	QC112	QC212 29.7.05
C6-C9 fraction	< 2	< 2	< 5
C10-C14 fraction	< 50	< 50	< 10
C15-C28 fraction	< 100	< 100	120
C29-C36 fraction	< 100	360	280
C10-C36 fraction	-	360	380
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 1
Ethylbenzene	< 0.2	< 0.2	< 1
m&p-Xylene	< 0.2	< 0.2	< 2
o-Xylene	< 0.2	< 0.2	< 1
Total Xylene	-	-	-
Lead	14	14	12

Location	SB14_1.0-1.1	SB14_1.9-2.0	SB14_3.0-3.2
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	12	11	12

Location	MW01_0.0-0.1	MW01_3.0-3.2	QC109	QC209 28.7.05
C6-C9 fraction	< 2	< 2	< 2	< 5
C10-C14 fraction	< 50	< 50	< 50	< 10
C15-C28 fraction	< 100	< 100	< 100	< 50
C29-C36 fraction	< 100	< 100	< 100	< 50
C10-C36 fraction	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 1
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 1
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 2
o-Xylene	< 0.2	< 0.2	< 0.2	< 1
Total Xylene	-	-	-	-
Lead	15	13	11	14

SOIL RESULTS



GROUNDWATER RESULTS

LOCATION	MW13_25/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	< 0.001
Total PAHs	-
Arsenic	< 0.001
Cadmium	< 0.0001
Chromium	< 0.001
Copper	< 0.001
Nickel	0.001
Zinc	0.008

LOCATION	MW10_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	< 0.001
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW06_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.001
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW05_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.002
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

LOCATION	MW01_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.001
Total PAHs	-
Arsenic	< 0.001
Cadmium	0.0028
Chromium	0.003
Copper	0.008
Nickel	0.006
Zinc	0.017

DESIGNED: GVS | APPROVED:
DRAWN: TB | DATE:
DATE: 15/09/05 | STATUS: FINAL
PROJECT: 42423822
CAD FILE: 004a.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

▽ MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

Exceeds Adopted Investigation levels

All soil concentrations in mg/kg
All groundwater concentrations in µg/L except metal concentrations measured in mg/L
ND - Not detected
FD - Field duplicate
FT - Field Triplicate
NA - Not Analysed

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE
GEOLOGICAL CROSS SECTION A-A'

A3

URS

FIGURE 4a

Location	SB17_0.1-0.2	SB17_3.0-3.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	< 100
C10-C36 fraction	-	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	< 5	8

Location	SB16_3.2-3.7	SB16_6.5-6.8
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	< 100
C10-C36 fraction	-	-
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene	-	-
Lead	15	17

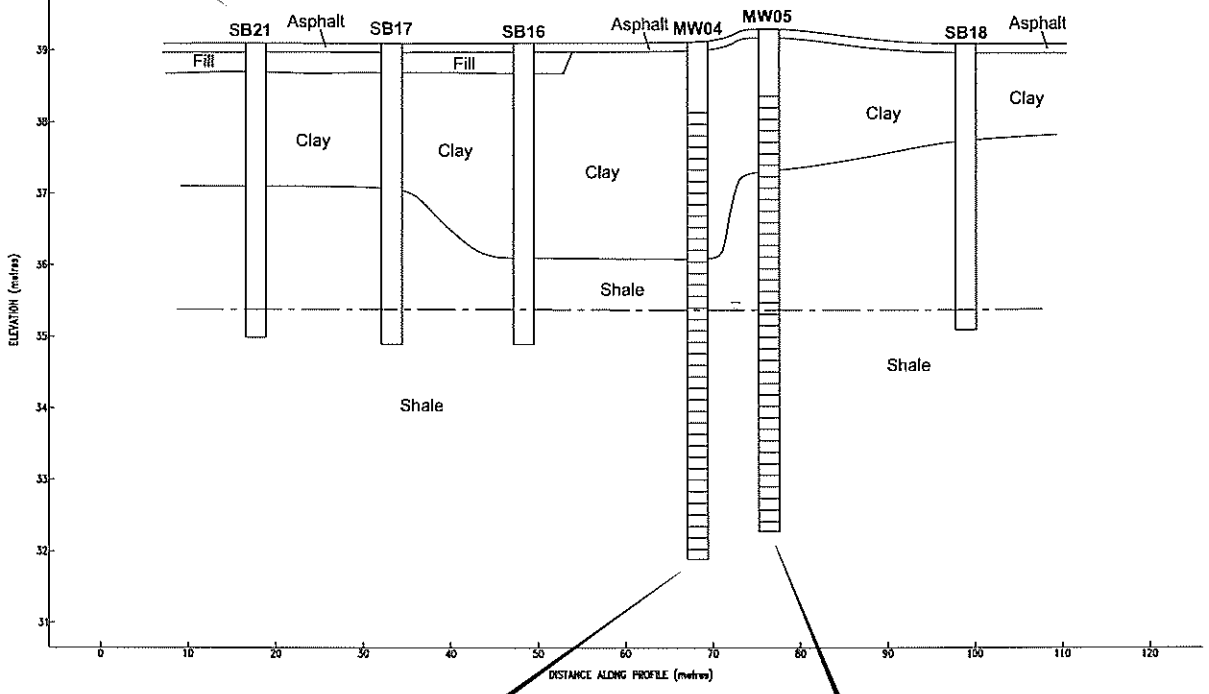
Location	MW04_0.5-0.6	MW04_4.0-4.2	MW04_6.0-6.2	QC111	QC211
C6-C9 fraction	< 2	< 2	3	5	5
C10-C14 fraction	< 50	< 50	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100	< 100	< 100
C29-C36 fraction	< 100	< 100	< 100	< 100	< 100
C10-C36 fraction	-	-	-	-	-
Benzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-	-	-
Lead	20	11	15	15	14

Location	MW05_1.0-1.1	MW05_2.0-2.2	MW05_5.0-5.2
C6-C9 fraction	< 2	3	2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	500	< 100
C29-C36 fraction	< 100	< 100	< 100
C10-C36 fraction	-	500	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	0.2	-
Lead	20	12	14

Location	SB18_0.2-0.3	SB18_0.5-0.6	SB18_3.9-4.0
C6-C9 fraction	< 2	< 2	< 2
C10-C14 fraction	< 50	< 50	< 50
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	-	-	-
C10-C36 fraction	-	-	-
Benzene	< 0.2	< 0.2	< 0.2
Toluene	< 0.2	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2	< 0.2
Total Xylene	-	-	-
Lead	14	16	11

Location	SB21_0.5-0.6	SB21_4.0-4.2
C6-C9 fraction	< 2	< 2
C10-C14 fraction	< 50	< 50
C15-C28 fraction	< 100	< 100
C29-C36 fraction	< 100	250
C10-C36 fraction		250
Benzene	< 0.2	< 0.2
Toluene	< 0.2	< 0.2
Ethylbenzene	< 0.2	< 0.2
m&p-Xylene	< 0.2	< 0.2
o-Xylene	< 0.2	< 0.2
Total Xylene		-
Lead	13	15

SOIL RESULTS



GROUNDWATER RESULTS

LOCATION	MW04_19/8/05	QC01	QC02_19.8.05
C6-C9 fraction	< 20	< 20	< 20
C10-C14 fraction	< 50	< 50	< 20
C15-C28 fraction	< 100	< 100	< 100
C29-C36 fraction	< 50	< 50	< 100
C10-C36 fraction	-	-	-
Benzene	< 1	< 1	< 0.5
Toluene	< 2	< 2	< 1
Ethylbenzene	< 2	< 2	< 1
m&p-Xylene	< 2	< 2	< 2
o-Xylene	< 2	< 2	< 1
Total Xylene	-	-	-
Lead	< 0.001	< 0.001	0.001
Total PAHs	-	-	<1
Arsenic	0.004	0.004	0.005
Cadmium	0.0002	0.0001	0.0002
Chromium	< 0.001	< 0.001	0.003
Copper	0.002	0.002	< 0.001
Nickel	0.015	0.016	0.016
Zinc	0.014	0.017	0.015

LOCATION	MW05_19/8/05
C6-C9 fraction	< 20
C10-C14 fraction	< 50
C15-C28 fraction	< 100
C29-C36 fraction	< 50
C10-C36 fraction	-
Benzene	< 1
Toluene	< 2
Ethylbenzene	< 2
m&p-Xylene	< 2
o-Xylene	< 2
Total Xylene	-
Lead	0.002
Total PAHs	-
Arsenic	-
Cadmium	-
Chromium	-
Copper	-
Nickel	-
Zinc	-

DESIGNED: GVS | APPROVED:
DRAWN: TB | DATE:
DATE: 16/09/05 | STATUS: FINAL
PROJECT: 42423822
CAD FILE: 004b.DWG
REVISION: A

SCALE AS PER DISTANCE ALONG PROFILE

LEGEND

MEASURED WATER LEVEL (mAHD)

STABILISED WATER LEVEL (mAHD)

Exceeds Adopted Investigation levels

All soil concentrations in mg/kg
All groundwater concentrations in µg/L except metal concentrations measured in mg/L
ND - Not detected
FD - Field duplicate
FT - Field Triplicate
NA - Not Analysed

DATE DATA COLLECTED
18/7/05 to 1/8/05 & 18/8/05

CLIENT
MOBIL OIL AUSTRALIA PTY LTD

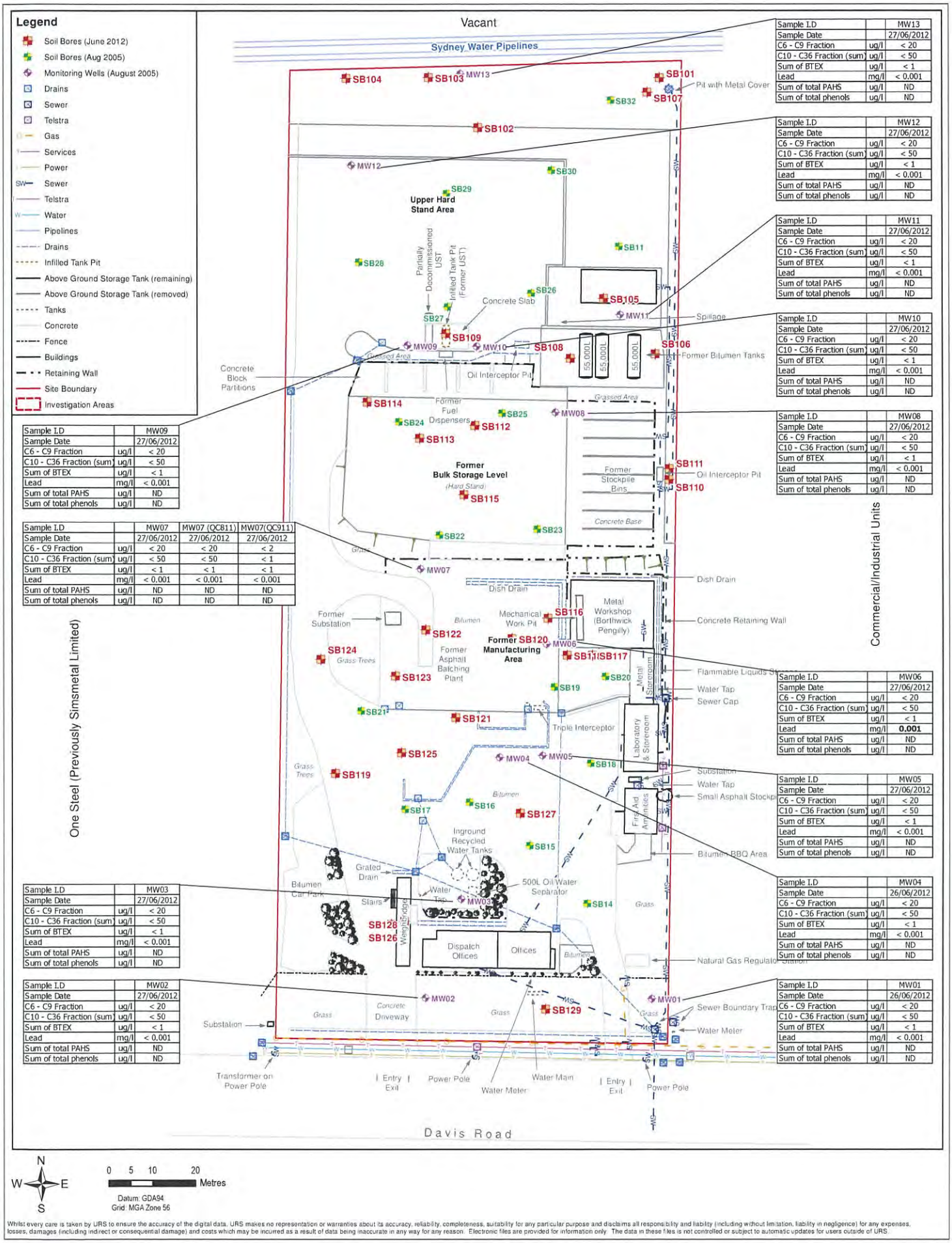
PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW

TITLE
GEOLOGICAL CROSS SECTION B-B'

A3

URS

FIGURE 4b



Sample I.D		MW13
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW12
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW11
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW10
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW09
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW08
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW07	MW07 (QC811)	MW07(QC911)
Sample Date		27/06/2012	27/06/2012	27/06/2012
C6 - C9 Fraction	ug/l	< 20	< 20	< 2
C10 - C36 Fraction (sum)	ug/l	< 50	< 50	< 1
Sum of BTEX	ug/l	< 1	< 1	< 1
Lead	mg/l	< 0.001	< 0.001	< 0.001
Sum of total PAHS	ug/l	ND	ND	ND
Sum of total phenols	ug/l	ND	ND	ND

Sample I.D		MW06
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	**0.001**
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW05
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW04
Sample Date		26/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW03
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW02
Sample Date		27/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

Sample I.D		MW01
Sample Date		26/06/2012
C6 - C9 Fraction	ug/l	< 20
C10 - C36 Fraction (sum)	ug/l	< 50
Sum of BTEX	ug/l	< 1
Lead	mg/l	< 0.001
Sum of total PAHS	ug/l	ND
Sum of total phenols	ug/l	ND

N W E S

0 5 10 20 Metres

Datum: GDA94
Grid: MGA Zone 56

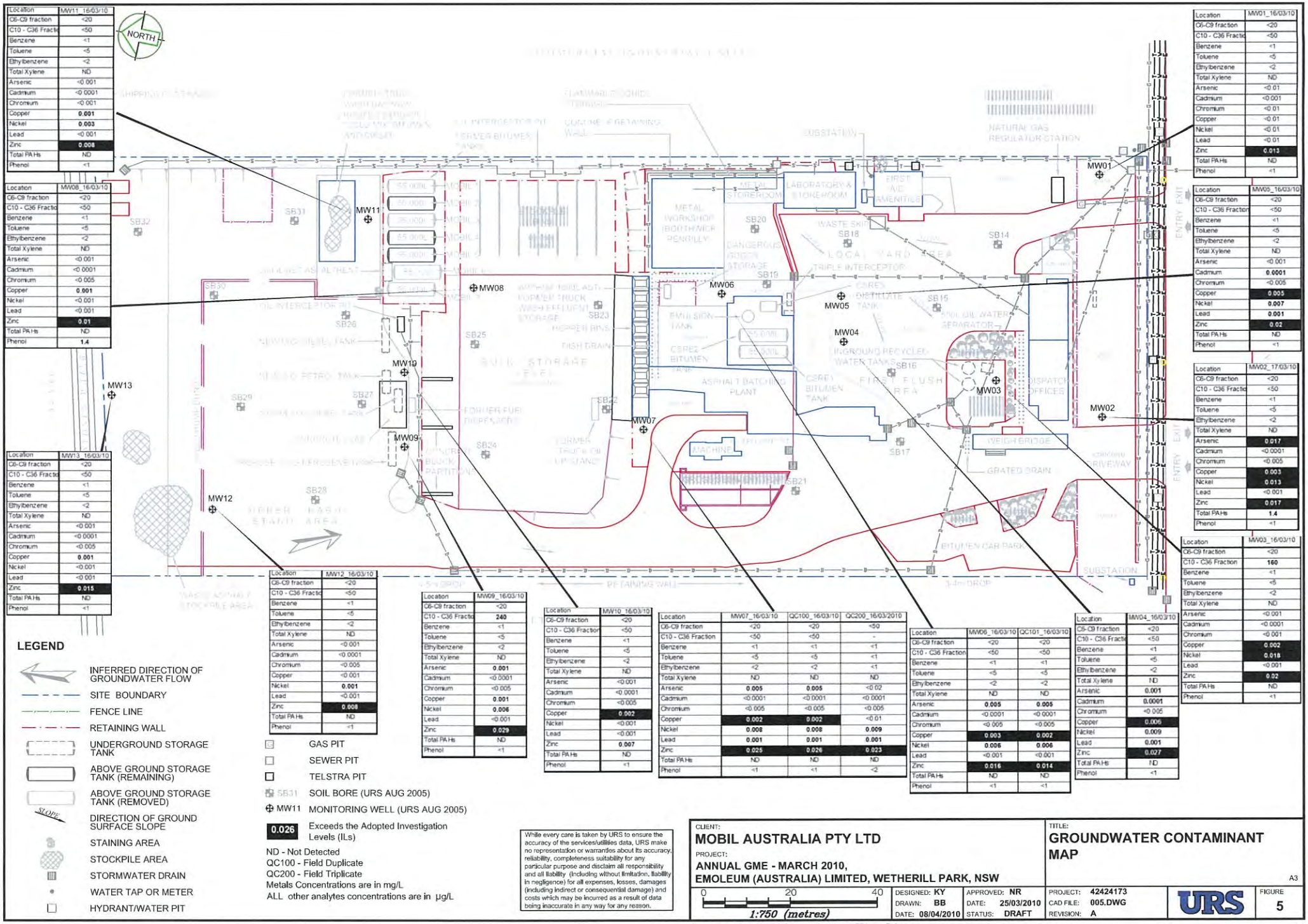
MOBIL OIL AUSTRALIA

WETHERILL PARK TEST PITTING,
FORMER WETHERILL PARK EMOLEUM DEPOT

GROUNDWATER ANALYTICAL RESULTS MAP

URS | 24 DAVIS ROAD, WETHERILL PARK, NSW | Figure: 8

File No: 42424444.006.mxd | Drawn: STB | Approved: MF | Date: 08/08/2012 | Rev. A | A3



Location	MW11_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	**0.001**
Nickel	**0.003**
Lead	<0.001
Zinc	**0.008**
Total PAHs	ND
Phenol	<1

Location	MW08_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	<0.001
Lead	<0.001
Zinc	**0.01**
Total PAHs	ND
Phenol	**1.4**

Location	MW13_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	<0.001
Lead	<0.001
Zinc	**0.015**
Total PAHs	ND
Phenol	<1

Location	MW12_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	<0.001
Nickel	**0.001**
Lead	<0.001
Zinc	**0.008**
Total PAHs	ND
Phenol	<1

Location	MW09_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	**240**
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.001**
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.001**
Nickel	**0.006**
Lead	<0.001
Zinc	**0.029**
Total PAHs	ND
Phenol	<1

Location	MW10_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.002**
Nickel	<0.001
Lead	<0.001
Zinc	**0.007**
Total PAHs	ND
Phenol	<1

Location	MW07_16/03/10	QC100_16/03/10	QC200_16/03/2010
C6-C9 fraction	<20	<20	<50
C10 - C36 Fraction	<50	<50	-
Benzene	<1	<1	<1
Toluene	<5	<5	<1
Ethylbenzene	<2	<2	<1
Total Xylene	ND	ND	ND
Arsenic	**0.005**	**0.005**	<0.02
Cadmium	<0.0001	<0.0001	<0.0001
Chromium	<0.005	<0.005	<0.005
Copper	**0.002**	**0.002**	<0.01
Nickel	**0.008**	**0.008**	**0.009**
Lead	**0.001**	**0.001**	**0.001**
Zinc	**0.025**	**0.026**	**0.023**
Total PAHs	ND	ND	ND
Phenol	<1	<1	<2

Location	MW06_16/03/10	QC101_16/03/10
C6-C9 fraction	<20	<20
C10 - C36 Fraction	<50	<50
Benzene	<1	<1
Toluene	<5	<5
Ethylbenzene	<2	<2
Total Xylene	ND	ND
Arsenic	**0.005**	**0.005**
Cadmium	<0.0001	<0.0001
Chromium	<0.005	<0.005
Copper	**0.003**	**0.002**
Nickel	**0.006**	**0.006**
Lead	<0.001	<0.001
Zinc	**0.016**	**0.014**
Total PAHs	ND	ND
Phenol	<1	<1

Location	MW04_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.001**
Cadmium	**0.0001**
Chromium	<0.005
Copper	**0.006**
Nickel	**0.009**
Lead	**0.001**
Zinc	**0.027**
Total PAHs	ND
Phenol	<1

Location	MW01_16/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.01
Cadmium	<0.001
Chromium	<0.01
Copper	<0.01
Nickel	<0.01
Lead	<0.01
Zinc	**0.013**
Total PAHs	ND
Phenol	<1

Location	MW05_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	**0.0001**
Chromium	<0.005
Copper	**0.005**
Nickel	**0.007**
Lead	**0.001**
Zinc	**0.02**
Total PAHs	ND
Phenol	<1

Location	MW02_17/03/10
C6-C9 fraction	<20
C10 - C36 Fracti	<50
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	**0.017**
Cadmium	<0.0001
Chromium	<0.005
Copper	**0.003**
Nickel	**0.013**
Lead	<0.001
Zinc	**0.017**
Total PAHs	**1.4**
Phenol	<1

Location	MW03_16/03/10
C6-C9 fraction	<20
C10 - C36 Fraction	**160**
Benzene	<1
Toluene	<5
Ethylbenzene	<2
Total Xylene	ND
Arsenic	<0.001
Cadmium	<0.0001
Chromium	<0.001
Copper	**0.002**
Nickel	**0.018**
Lead	<0.001
Zinc	**0.02**
Total PAHs	ND
Phenol	<1

LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- SLOPE — DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 — SOIL BORE (URS AUG 2005)
- MW11 — MONITORING WELL (URS AUG 2005)
- **0.026** — Exceeds the Adopted Investigation Levels (ILs)

ND - Not Detected
QC100 - Field Duplicate
QC200 - Field Triplicate
Metals Concentrations are in mg/L
ALL other analytes concentrations are in µg/L

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - MARCH 2010, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

TITLE: **GROUNDWATER CONTAMINANT MAP**

A3

0 20 40

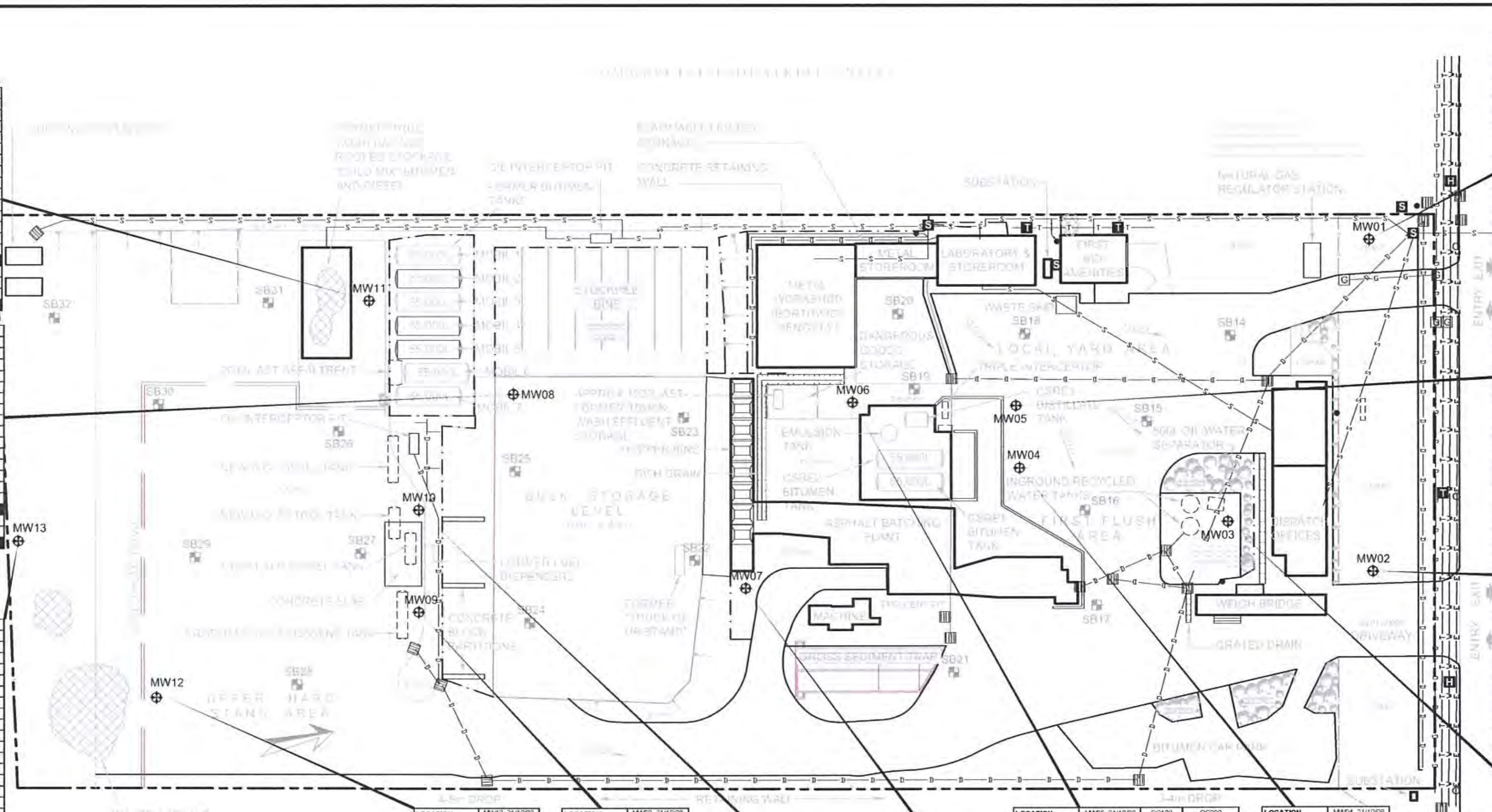
1:750 (metres)

DESIGNED: KY | APPROVED: NR
DRAWN: BB | DATE: 25/03/2010
DATE: 08/04/2010 | STATUS: DRAFT

PROJECT: 42424173
CAD FILE: 005.DWG
REVISION: A

URS

FIGURE 5



LOCATION	MW11_21/10/08	MW08_21/10/08	MW13_21/10/08	MW12_21/10/08	MW09_21/10/08	MW10_21/10/08	MW07_21/10/08	MW06_21/10/08	QC100	QC200	MW04_21/10/08	MW01_21/10/08	MW05_21/10/08	MW02_21/10/08	MW03_21/10/08
C6-C9 fraction	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C10-C14 fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<40	<50	<50	<50	100	<50
C15-C28 fraction	<100	<100	<100	<100	200	<100	100	<100	<100	<100	<100	<100	<100	500	<100
C29-C36 fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	130	<50
C10-C36 fraction	<50	<50	<50	<50	200	<50	100	<50	<50	ND	ND	<50	<50	730	<50
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1
Toluene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2
Ethylbenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2
m&p-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
o-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2
Total Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	0.001	<0.01	<0.001	<0.001	<0.001
Total PAHs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND
Arsenic	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.013	0.006	0.006	0.0061	<0.001	<0.01	<0.001	0.02	<0.001
Cadmium	0.0004	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	0.0001	0.0003	0.0001	<0.002	0.0002	<0.001	0.0002	<0.0001	0.0001
Chromium	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.002	0.011	0.002	<0.01	0.003	0.002	0.003
Copper	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.001	<0.005	0.002	<0.02	0.002	0.002	0.002
Nickel	0.001	<0.001	<0.001	<0.001	0.012	<0.001	0.016	0.022	0.021	0.024	0.007	<0.01	0.01	0.03	0.019
Zinc	0.019	0.013	0.015	0.026	0.019	0.023	0.022	0.054	0.025	0.026	0.019	<0.05	0.022	0.025	0.028

LEGEND

- INFERRED DIRECTION OF GROUNDWATER FLOW
- SITE BOUNDARY
- FENCE LINE
- RETAINING WALL
- UNDERGROUND STORAGE TANK
- ABOVE GROUND STORAGE TANK (REMAINING)
- ABOVE GROUND STORAGE TANK (REMOVED)
- DIRECTION OF GROUND SURFACE SLOPE
- STAINING AREA
- STOCKPILE AREA
- STORMWATER DRAIN
- WATER TAP OR METER
- HYDRANT/WATER PIT
- GAS PIT
- SEWER PIT
- TELSTRA PIT
- SB31 SOIL BORE (URS AUG 2005)
- MW11 MONITORING WELL (URS AUG 2005)
- 0.026 Exceeds the Adopted Investigation Levels (ILs)

ND - Not Detected
QC100 - Field Duplicate
QC200 - Field Triplicate
Metals Concentrations are in mg/L
ALL other analytes concentrations are in µg/L

CLIENT: **MOBIL AUSTRALIA PTY LTD**

PROJECT: **ANNUAL GME - OCTOBER 2008, EMOLEUM (AUSTRALIA) LIMITED, WETHERILL PARK, NSW**

0 20 40 1:750 (metres)

DESIGNED: KY	APPROVED: NR	PROJECT: 42424135
DRAWN: BB	DATE: 25/11/08	CAD FILE: 005.DWG
DATE: 25/11/08	STATUS: DRAFT	REVISION: A

TITLE: **GROUNDWATER CONTAMINANT MAP**

URS — FIGURE 5 — A3

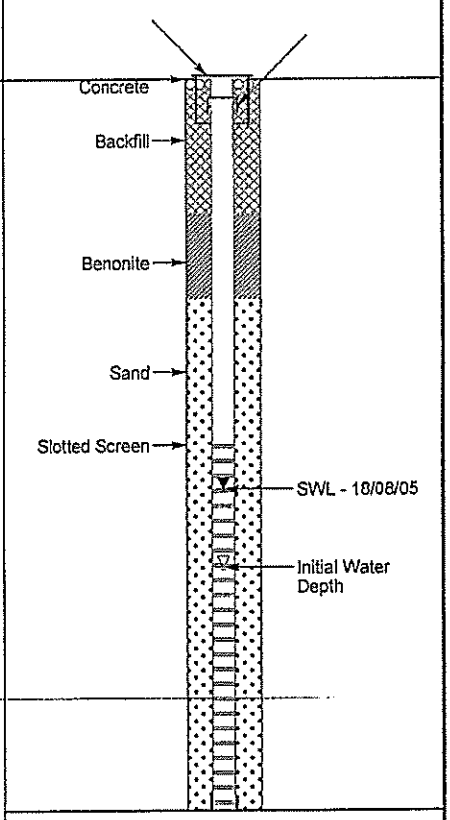
MONITORING WELL MW01

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie		Project Reference: Emoleum Depot Wetherill Park Project No.: 42423822	Client: Mobil Oil Australia Location: 24 Davis Road Wetherill Park
Logged By: KG and EC Checked By: Date Started: 21-07-05 Date Finished: 28-07-05	Bore Size: mm Total Depth: 8.00 m Casing Size: 50 mm	Relative Level: 36.58 mAHD Coordinates: 6253823.90 N 305636.20 E Permit No:	Drill Type: Down hole hammer Drill Medel: 1350 Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0	MW01_0.0-0.1		Sandy SILT: brown, roots, no odour, dry	SILT	0	D
	0	MW01_0.5-0.6		Silty CLAY: brown, dry, no odour	CL	1	D
	0	MW01_1.0-1.1		Air kinfed to 1.2m	CL	2	
	0	MW01_2.0-2.2		Silty CLAY: light brown, hard, contains shale gravels becoming shale, no odour	CL	3	
	0	MW01_3.0-3.2, QC109, QC209		Clayey SHALE: brown, hard, brittle, no odour	SHALE	4	
				CLAY: wet, too soft, clogs up chute (no sample were taken after this depth)	CL	5	
						6	
				EOH @ 6m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



MONITORING WELL MW02

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 28-07-05

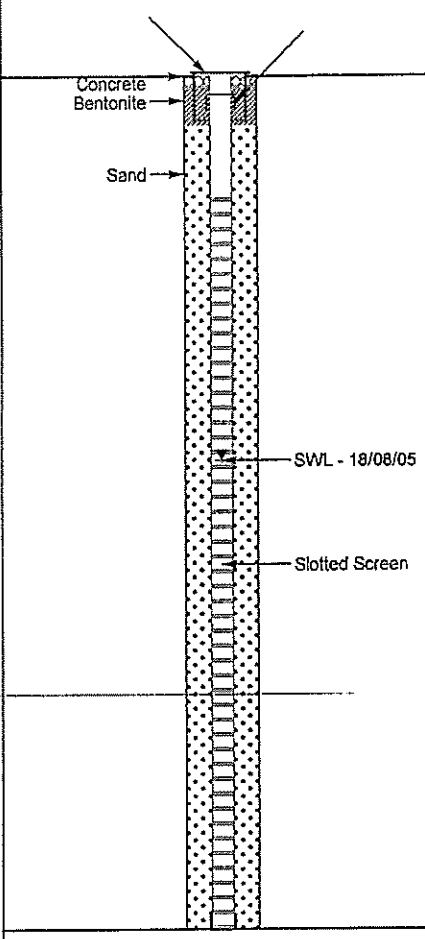
Bore Size: mm
Total Depth: 7.00 m
Casing Size: 50 mm

Relative Level: 37.09 mAHD
Coordinates: 6253826.60 N
305588.60 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW02_0.0-0.1		Sandy SILT: brown, roots, dry, no odour	SILT	0	D
	0	MW02_0.5-0.6		CLAY: brown, dry, no odour	CL		D
	0	MW02_1.0-1.1		Air Knifed to 1.2m	CL	1	
	0	MW02_2.0-2.2		CLAY: red/brown, fine grained, dry, no odour, low plasticity, shale gravels	CL	2	D
	0	MW02_3.0-3.2		Clayey SHALE: pale brown/grey, fine grained, no odour, shale gravels	SHALE	3	
	0	MW02_4.0-4.2		SHALE: grey shale with red clay parts, hard, brittle, no odour	SHALE	4	
				SHALE: grey, weathered, fine grained, gravels, no odour	SHALE	5	
				SHALE: pale grey, weathered small gravels, no odour	SHALE	6	
				EOH@7m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW03

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 01-08-05

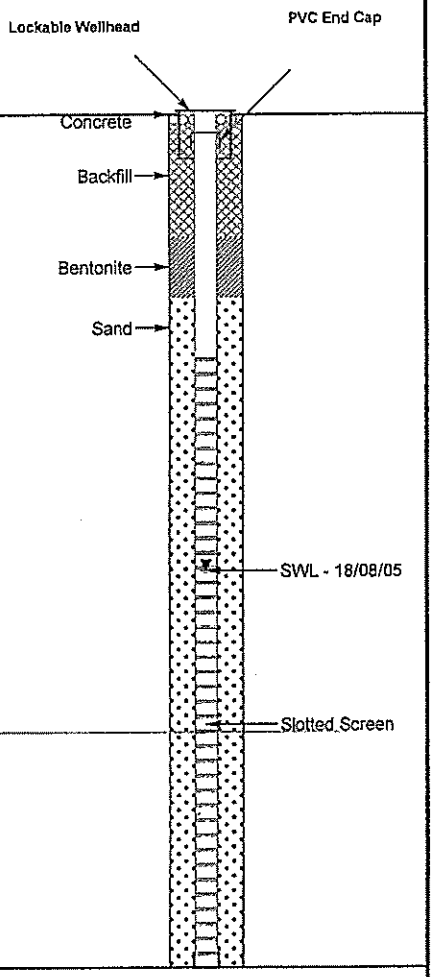
Bore Size: mm
Total Depth: 7.00 m
Casing Size: 50 mm

Relative Level: 37.88 mAHD
Coordinates: 6253847.70 N
305594.10 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0.1	MW03_0.0-0.1		SILT: brown, roots, dry, no odour	SILT	0	D
	0	MW03_0.5-0.6		Silty CLAY: brown, dry, no odour	CL-ML		D
	0	MW03_1.0-1.1		Air knifed to 1.2m Clayey SHALE: very fine grained, brown, dry, no odour	SHALE	1	D
	4.8	MW03_1.9-2.0				2	
				Shale gravels from 2.5m	SHALE		
	3.4	MW03_2.9-3.0				3	
	3.2	MW03_3.9-4.0		Weathered SHALE: very fine grained, dry, grey, no odour	SHALE	4	D
	1.9	MW03_4.9-5.0		brown from 4.8m, clayey, dry	SHALE	5	D
	1.7	MW03_5.9-6.0		SHALE: grey, gravels, angular, fine grained, no odour	SHALE	6	
	0.0	MW03_6.9-7.0		EOH@7m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW04

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 19-07-05
Date Finished: 28-07-05

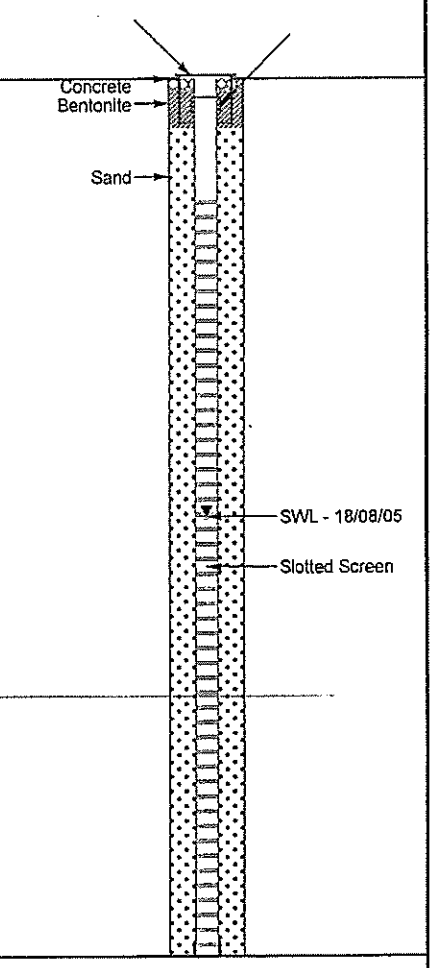
Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Relative Level: 39.09 mAHD
Coordinates: 6253879.60 N
305605.20 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW04_0.0-0.1		BITUMEN	ASPHALT	0	M
				Sandy CLAY: brown, moist, no odour	CLS		
	0	MW04_0.5-0.6		CLAY: light brown/grey, dry, no odour	CL		D
	0	MW04_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW04_2.0-2.2		Silty CLAY: red/brown, fine grained, dry, no odour, no gravels	CL-ML	2	D
	0	MW04_3.0-3.2		Clayey SHALE: light brown, fine grained, no odour, shale gravels, hard	SHALE	3	
	0	MW04_4.0-4.2		SHALE: weathered, grey, fine grained, no odour, shale gravels	SHALE	4	
	0	MW04_5.0-5.2		SHALE: grey/brown, fine grained, dry, no odour, fine gravels	SHALE	5	D
	0	MW04_6.0-6.2, QC111, QC211				6	
	0	MW04_7.0-7.2		SHALE: grey, soft, fine grained, weathered, no odour	SHALE	7	
				EOH @ 7.2 m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW05

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By:	KG and EC	Bore Size:	mm	Relative Level:	39.28 mAHD
Checked By:		Total Depth:	7.00 m	Coordinates:	6253879.80 N
Date Started:	19-07-05	Casing Size:	50 mm		305613.40 E
Date Finished:	28-07-05			Permit No:	

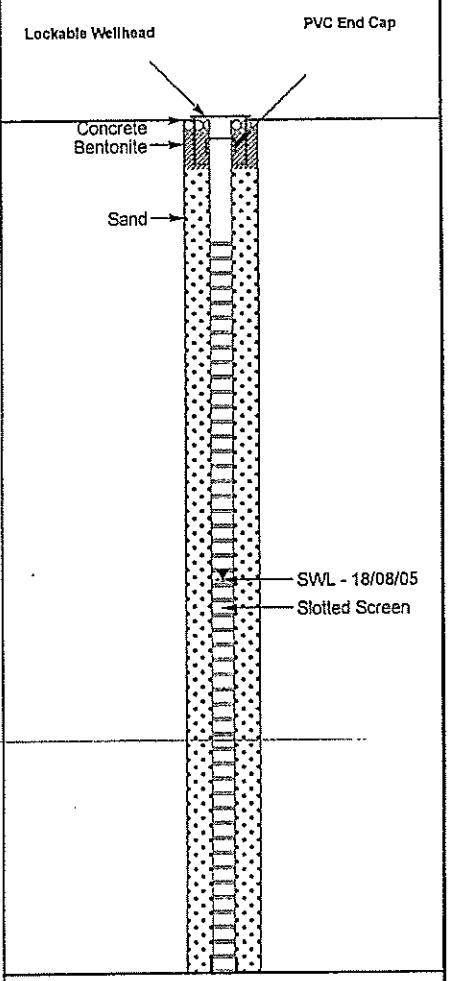
Drill Type: Down hole hammer

Drill Model: 1350

Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0.4	MW05_0.0-0.1, QAQC101, QAQC201		BITUMEN	ASPHALT	0	M
				Gravely Sandy SILT: dark grey, moist, no odur	SILT		M
	0.2	MW05_0.5-0.6		CLAY: grey/brown, stiff, moist, no odour	CL		D
	0.1	MW05_1.0-1.1		CLAY: brown, stiff, dry, no odour	CL	1	
				Air knifed to 1.2m	CL		
	0	MW05_2.0-2.2		Clayey SHALE: brown, dry, shale gravels, no odour	SHALE	2	D
	0	MW05_3.0-3.2				3	
	0	MW05_4.0-4.2		SHALE: weathered shale, silty clay, fine grained, no odour, no gravels	SHALE	4	
	0	MW05_5.0-5.2		SHALE: light brown, weathered, dry, no odour, no gravels	SHALE	5	D
	0	MW05_6.0-6.2				6	
				EOH @ 7.0m		7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW06

URS

URS Australia Pty. Ltd
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 19-07-05
Date Finished: 29-07-05

Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

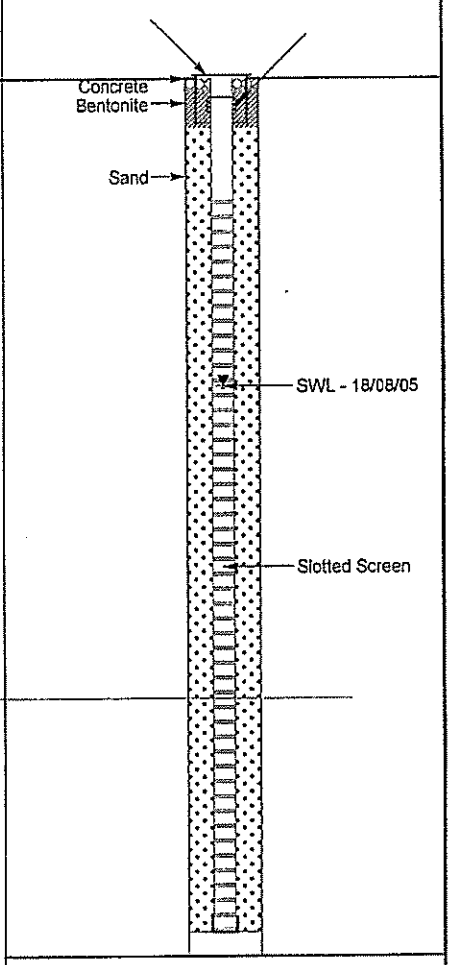
Relative Level: 39.39 mAHD
Coordinates: 6253909.00 N
305614.10 E
Permit No:

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW06_0.0-0.1		BITUMEN	ASPHALT	0	
				Gravely Silty SAND: dark grey, compact, no odour	SP		
	0	MW06_0.5-0.6		Silty CLAY: dark grey, compact/stiff, moist, no odour	CL-ML		M
	0	MW06_1.0-1.1		CLAY: grey, stiff, dry	CL	1	D
				Air knifed to 1.2m	CL		
	4.1	MW06_2.0-2.2		Clayey SHALE: light brown/grey, weathered, fine grained, no odour, shale gravels	SHALE	2	
	0.3	MW06_3.0-3.2		grey shale, gravels, hard		3	
	1.9	MW06_4.0-4.2		fine gravels		4	
	0	MW06_5.0-5.2		SHALE: soft, fine grained, no odour, shale gravels, powdery	SHALE	5	
	0	MW06_6.0-6.2		fine gravels, no odour	SHALE	6	
	0	MW06_7.0-7.2				7	
				EOH@7.2m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW07

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 29-07-05

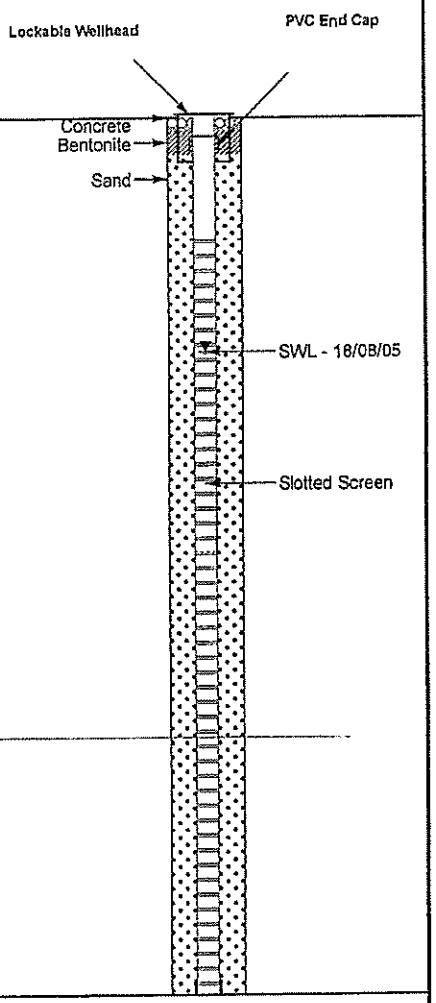
Bore Size: mm
Total Depth: 7.20 m
Casing Size: 50 mm

Relative Level: 39.34 mAHD
Coordinates: 6253922.60 N
305585.50 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW07_0.1-0.2		BITUMEN	ASPHALT	0	
				FILL: gravel, sand, roadbase, black	FILL		
	0	MW07_0.5-0.6		CLAY: dark grey, stiff, no odour	CL		
	0	MW07_1.0-1.1		CLAY: dark grey/brown, stiff, dry	CL	1	D
				Air knifed to 1.2m	CL		
	0	MW07_2.0-2.2		Clayey SHALE: medium brown clay, shale gravels, dry, no odour	SHALE	2	D
	0	MW07_3.0-3.2		fine gravels	SHALE	3	
	0	MW07_4.0-4.2		Weathered SHALE: pale brown, fine grained, sharp gravels, no odour, dry	SHALE	4	D
		MW07_5.0-5.2		SHALE: grey, powdery, fine grained, hard sharp gravels, no odour	SHALE	5	
		MW07_6.0-6.2		fine gravels	SHALE	6	
		MW07_7.0-7.2, QC113, QC213		powdery, grey, dry, no odour, no gravels	SHALE	7	D
				EOH@7.2m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

URS

MONITORING WELL MW08

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 20-07-05
Date Finished: 01-08-05

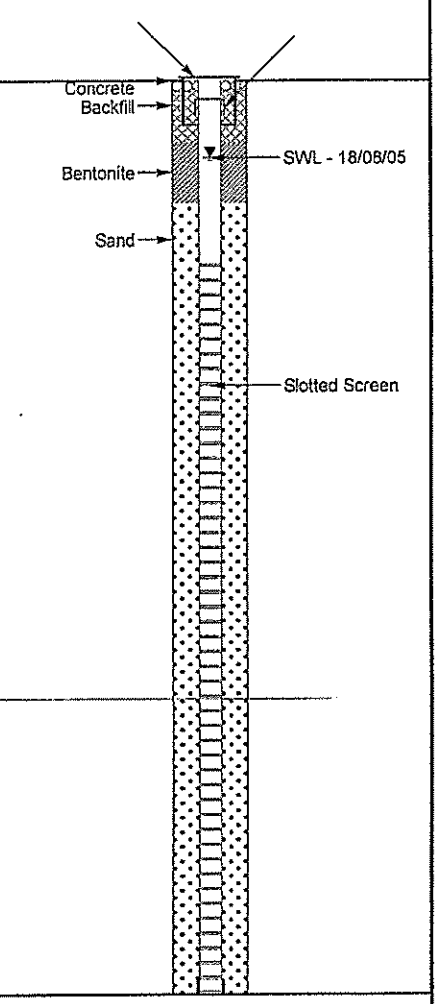
Bore Size: mm
Total Depth: 7.50 m
Casing Size: 50 mm

Relative Level: 43.50 mAHD
Coordinates: 6253960.90 N
305619.00 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
		MW08_0.1-0.2		Gravely SAND: dark grey, dry, no odour	SPG	0	D
		MW08_0.5-0.6		CLAY: light brown/brown, stiff, no odour, dry	CL		D
		MW08_1.0-1.1		CLAY: light brown/grey	CL	1	
				Air knifed to 1.2m			
				Clayey SHALE: grey, angular gravels, fine to medium grained, dry to moist, no odour	SHALE		D/M
	2.3	MW08_1.9-2.0				2	
				Brown from 2.5m			
	0.9	MW08_2.9-3.0				3	
	2.3	MW08_3.9-4.0		SHALE: angular gravels, grey/brown, dry, no odour	SHALE	4	D
	2.3	MW08_4.9-5.0				5	
	2.3	MW08_5.9-6.0		SHALE: angular gravels, fine grained, grey/brown, no odour	SHALE	6	
	2.9	MW08_7.4-7.5				7	
				EOH@7.5m		8	
						9	
						10	

WELL CONSTRUCTION DETAILS



MONITORING WELL MW09

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park
Project No.: 42423822

Client: Mobil Oil Australia
Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 20-07-05
Date Finished: 27-07-05

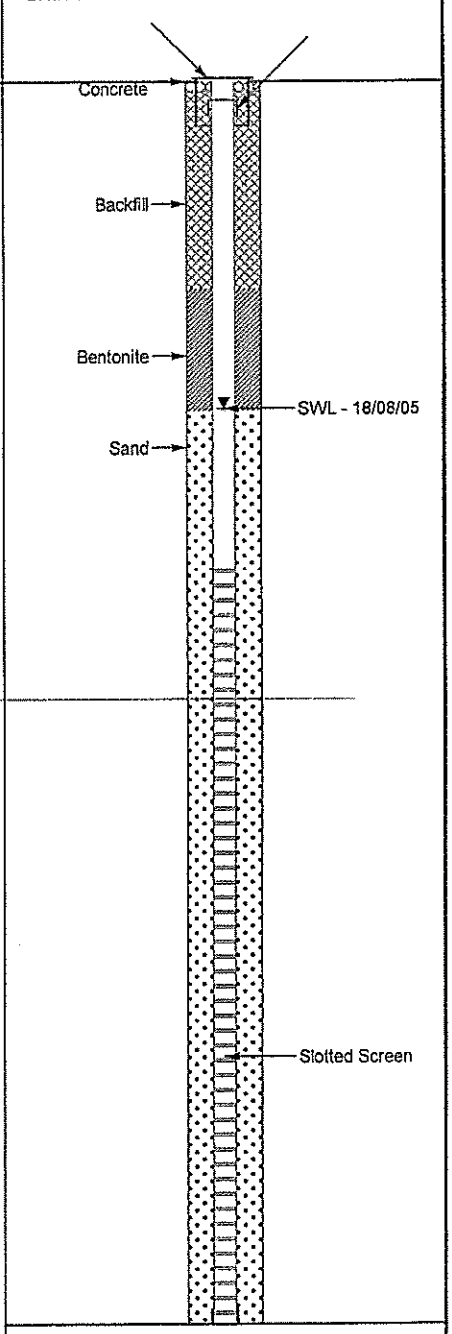
Bore Size: mm
Total Depth: 10.20 m
Casing Size: 50 mm

Relative Level: 45.67 mAHD
Coordinates: 6253976.70 N
305585.50 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
				BITUMEN	ASPHALT	0	
	0	MW09_0.5-0.6		FILL: sandy silt, brown, moist, no odour	FILL		M
	0	MW09_1.0-1.1		Air knifed to 1.2m	FILL	1	
	0	MW09_2.0-2.2		SHALE: dark brown, clay gravels, no odour	SHALE	2	
	0	MW09_3.0-3.2				3	
	0	MW09_4.0-4.2		SHALE: grey/brown, weathered clay/shale, large gravels, no odour	SHALE	4	
	0	MW09_5.0-5.2			SHALE	5	D
	0	MW09_6.0-6.2				6	
	0	MW09_7.0-7.2		SHALE: light grey, brittle, trace gravels, no odour	SHALE	7	
	0	MW09_8.0-8.2		SHALE: dark grey, fine grained, soft, no gravels, no odour	SHALE	8	
				SHALE: grey shale,weathered, dry, no odour	SHALE	9	D
	0	MW09_10.0-10.2				10	
				EOH @10.2 m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW10

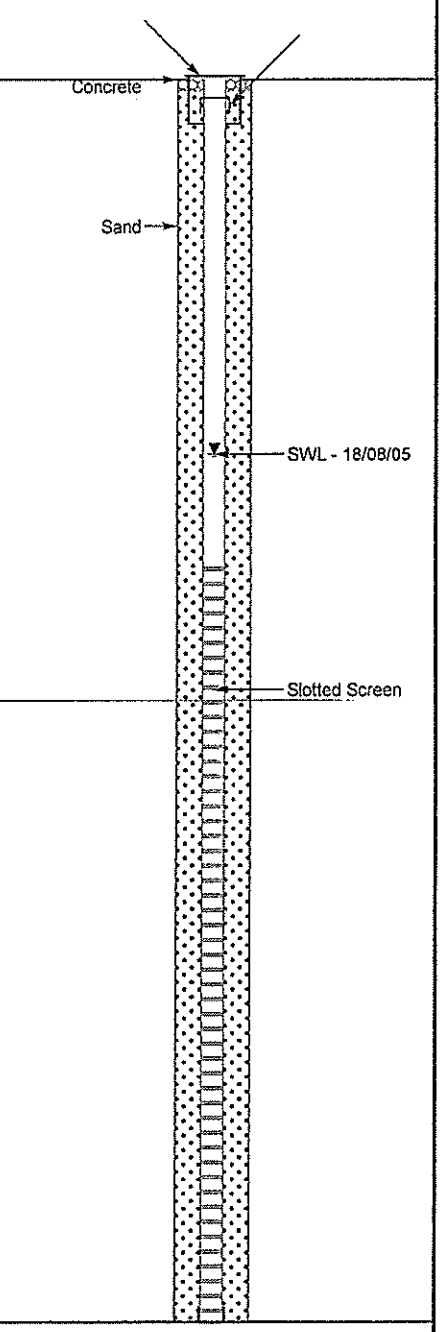
URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie

Logged By: KG and EC	Bore Size: mm	Project Reference: Emoleum Depot Wetherill Park	Client: Mobil Oil Australia
Checked By:	Total Depth: 10.20 m	Project No.: 42423822	Location: 24 Davis Road Wetherill Park
Date Started: 20-07-05	Casing Size: 50 mm	Relative Level: 46.14 mAHD	Drill Type: Down hole hammer
Date Finished: 27-07-05		Coordinates: 6253978.40 N 305598.00 E	Drill Model: 1350
		Permit No:	Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0	MW10_0.2-0.3		CLAY: brown, moist, stiff, no odour	CL	0	
	0	MW10_0.5-0.6					
	0	MW10_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW10_2.0-2.2		SANDSTONE: small cobbles/gravel, mixed basalt/granite/sandstone fine grained dust.	SSTONE	2	
	0	MW10_3.0-3.2		Weathered SANDSTONE: sandy clay, brown/black, sharp angular gravels, no odour	SSTONE	3	
	0	MW10_4.0-4.2		SHALE: yellow/brown, soft, fine grained, trace gravels	SHALE	4	
	0	MW10_5.0-5.2		SHALE: weathered, brown, fine grained, some gravels, no odour	SHALE	5	
	0	MW10_6.0-6.2				6	
	0	MW10_7.0-7.2, QC106, QC206		powdery talc, trace small gravel	SHALE	7	
	0	MW10_8.0-8.2		SHALE: Medium brown, fine grained talc, dry, no odour, no gravel	SHALE	8	D
						9	
				SHALE: pale grey, soft, powder, no gravels, no odour	SHALE		
	0	MW10_10.0-10.2				10	
				EOH @ 10.2 m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW11

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 27-07-05

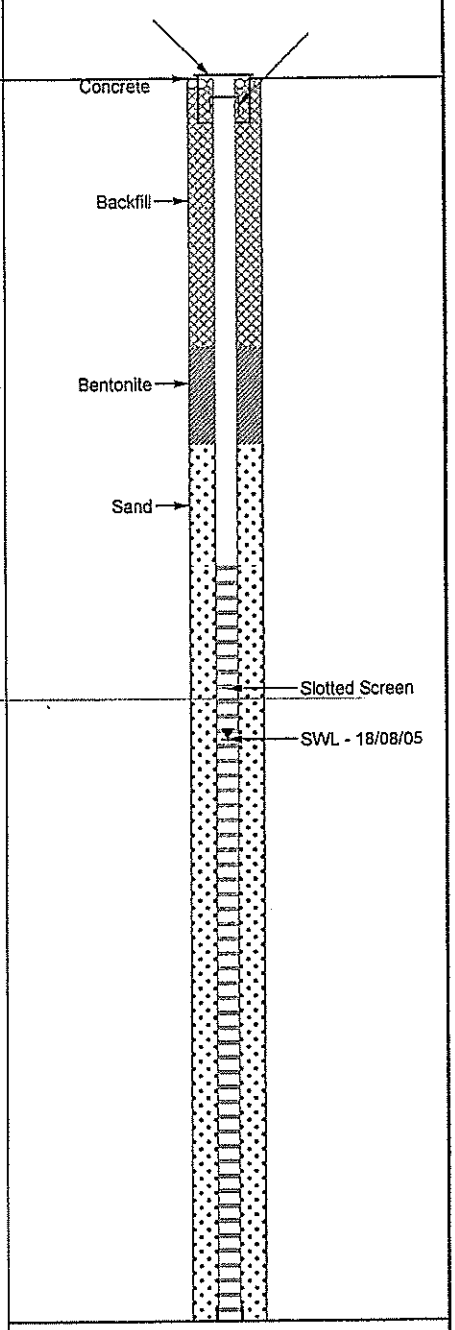
Bore Size: mm
Total Depth: 10.20 m
Casing Size: 50 mm

Relative Level: 46.92 mAHD
Coordinates: 6253982.30 N
305629.60 E
Permit No:

Drill Type: Down hole hammer
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
				CONCRETE	CNCRET	0	
	0	MW11_0.1-0.2, QAQC104, QAQC204		CLAY: brown, moist, stiff, no odour	CL		
	0	MW11_0.5-0.6		Silty CLAY: orange/brown, moist, stiff, no odour	CL		M
	0	MW11_1.0-1.1		Silty CLAY: light brown/brown, dry, stiff,	CL	1	D
				Air knifed to 1.2m	CL		
	0	MW11_2.0-2.2		SHALE: light brown, fine dust, gravels, dry, no odour	SHALE	2	D
	0	MW11_3.0-3.2		fine grained, silty clay, gravels, no odour		3	
	0	MW11_4.0-4.2		weathered, fine grained, dusty		4	
	0	MW11_5.0-5.2		no gravels		5	
	0	MW11_6.0-6.2		fill, dusty silty clay, light brown, dry, no odour, contains gravels		6	D
	0	MW11_7.0-7.2		white/grey, more small gravels		7	
	0	MW11_8.0-8.2		medium brown, fine grained, gravels		8	
				fine grained, talc powder, no odour		9	
	0	MW11_10.0-10.2		EOH @ 10.2 m		10	

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW12

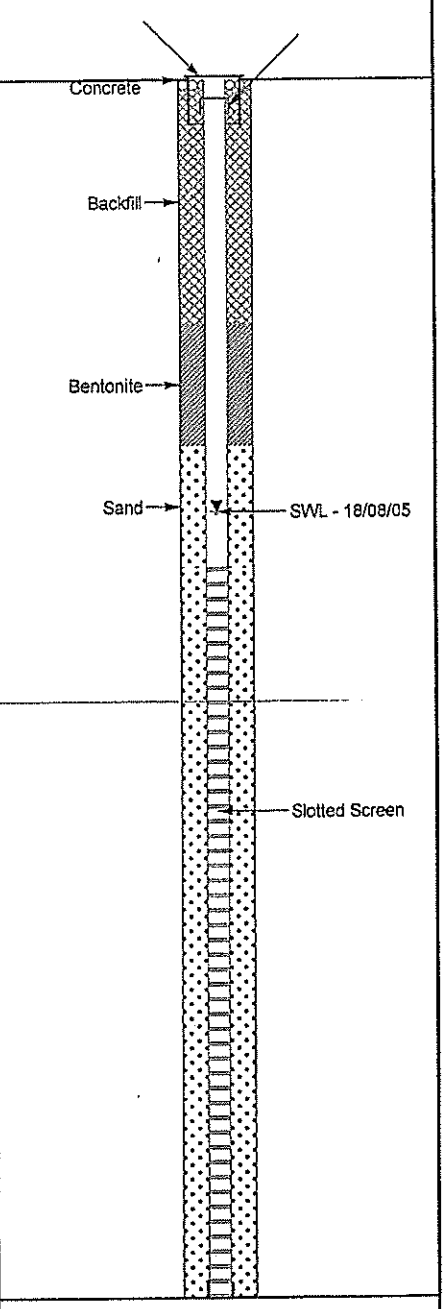
URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: Macquarie	Project Reference: Emoleum Depot Wetherill Park	Client: Mobil Oil Australia	
	Project No.: 42423822	Location: 24 Davis Road Wetherill Park	
Logged By: KG and EC	Bore Size: mm	Relative Level: 46.49 mAHD	Drill Type: Down hole hammer
Checked By:	Total Depth: 10.00 m	Coordinates: 6254015.20 N	Drill Model: 1350
Date Started: 21-07-05	Casing Size: 50 mm	305568.40 E	Drill Fluid: None
Date Finished: 22-07-05		Permit No:	

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
	0	MW12_0.1-0.2		BITUMEN	ASPHALT	0	M
				FILL: gravel silt, brown, moist no odour	FILL		
	0.1	MW12_0.5-0.6		FILL: gravel brown, dry, no odour	FILL		D
				FILL: Silty Clay, light brownt dry, no odour	FILL	1	D
	0.1	MW12_1.0-1.1		Air knifed to 1.2m	FILL		
				FILL: clay/slag/silt/gravel/sandstone, fine grained, red/brown/black, dry	FILL		D
	0	MW12_1.9-2.1				2	
				Clayey gravely SILT: fine grained, dry clay clasts, gravels to 5mm, brown, no odour	SILT		D
	0.5	MW12_2.9-3.0				3	
						4	
	0.4	MW12_4.9-5.0				5	
				Weathered SILTSTONE: Very fine grained, brown, dry, clayey	SILTSTONE		D
	0.8	MW12_5.9-6.0				6	
	0.3	MW12_6.9-7.0				7	
				SHALE: grey, dry, weathered	SHALE		D
	1.1	MW12_7.9-8.0				8	
	0.5	MW12_8.9-9.0				9	
	0.3	MW12_9.9-10.0				10	
				EOH@10m			

WELL CONSTRUCTION DETAILS



WELL_WITH_MOIST_CONDITION WETHERILL PARK BORELOGS.GPJ WCC_AUS.GDT 15/09/05

MONITORING WELL MW13

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: Emoleum Depot Wetherill Park

Project No.: 42423822

Client: Mobil Oil Australia

Location: 24 Davis Road Wetherill Park

Drilling Contractor: Macquarie

Logged By: KG and EC
Checked By:
Date Started: 21-07-05
Date Finished: 26-07-05

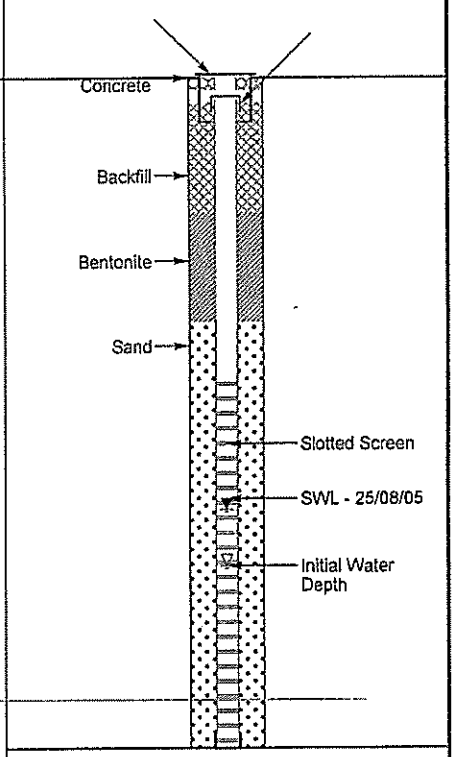
Bore Size: mm
Total Depth: 5.50 m
Casing Size: 50 mm

Relative Level: 46.75 mAHD
Coordinates: 6254032.40 N
305586.00 E
Permit No:

Drill Type: Solid stem auger
Drill Model: 1350
Drill Fluid: None

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
	0	MW13_0.1-0.2		GRAVEL/BITUMEN	ASPHALT	0	D
				FILL:gravel, sand, silt, black, dry, no odour	FILL		
	0	MW13_0.5-0.6		Silty CLAY: light brown/ brown, no odor, dry ,stiff	CL		D
	0	MW13_1.0-1.1		Air knifed to 1.2m	CL	1	
	0	MW13_2.0-2.2		Silty CLAY: orange, dry/moist, low plasticity, hard, gravels, no odour	CL	2	D/M
	0	MW13_3.0-3.2		Sandy CLAY: orange, dry/moist, low plasticity, large granite gravels	CL	3	D/M
	0	MW13_4.0-4.2		Silty CLAY: orange, dry/moist, low plasticity, loose, fine grained, gravels, water table struck	CL	4	D/M
				EOH@5.5m		5	
						6	
						7	
						8	
						9	
						10	

WELL CONSTRUCTION DETAILS

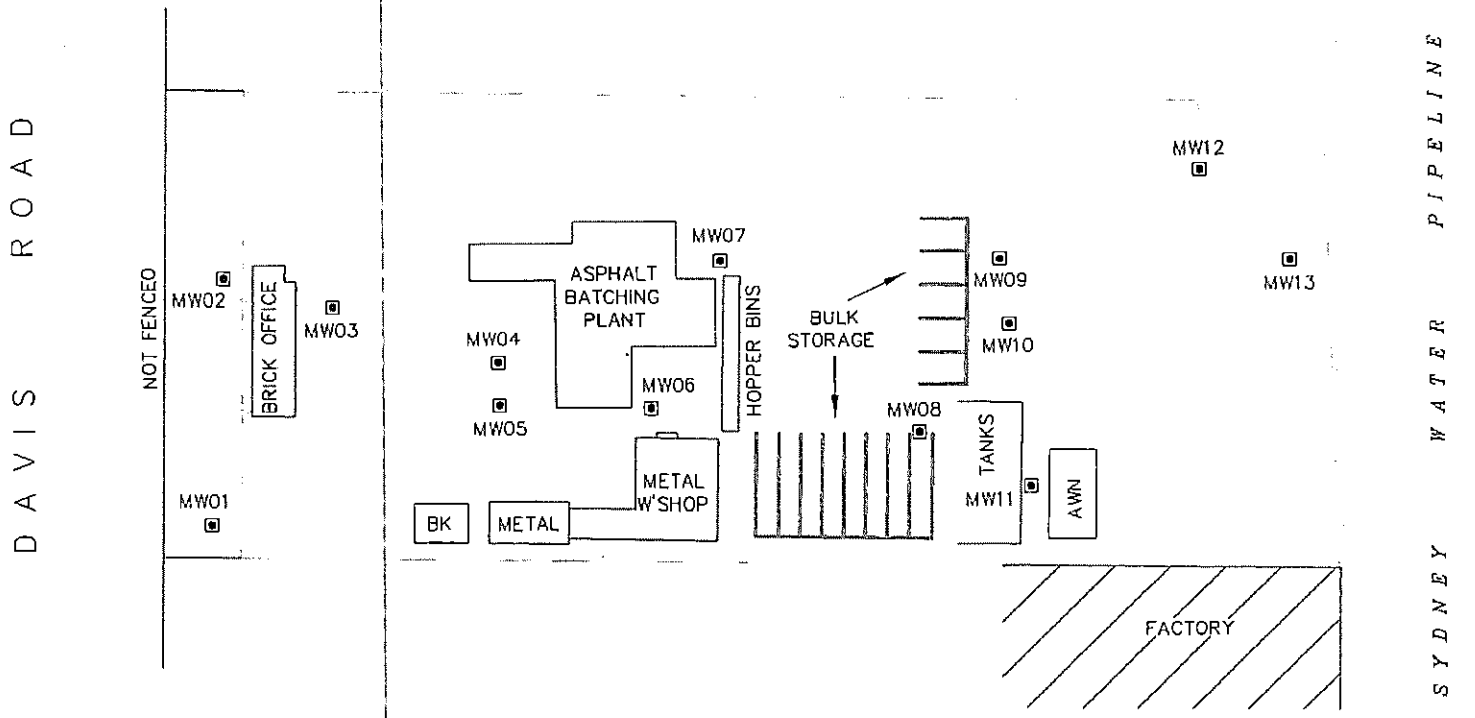


WELL_WITH_MOIST_CONDITION WETHERILL PARK.BORELOGS.GPJ WCC_AUS.GDT 15/09/05

	AMG COORDINATES		AHD HEIGHTS	
Pt No.	Easting	Northing	Top Of Pipe	Cover Plate
MW01	305636.2	6253823.9	36.50	36.58
MW02	305588.6	6253826.6	36.97	37.09
MW03	305594.1	6253847.7	37.79	37.88
MW04	305605.2	6253879.6	39.01	39.09
MW05	305613.4	6253879.8	39.20	39.28
MW06	305614.1	6253909.0	39.31	39.39
MW07	305585.5	6253922.6	39.26	39.34
MW08	305619.0	6253960.9	43.43	43.50
MW09	305585.5	6253976.7	45.57	45.67
MW10	305598.0	6253978.4	46.02	46.14
MW11	305629.6	6253982.3	46.84	46.92
MW12	305568.4	6254015.2	46.38	46.49
MW13	305586.0	6254032.4	46.65	46.75

AMG

NOTE: FENCING & EDGING IS SHOWN FOR ORIENTATION PURPOSES ONLY AND DOES NOT DEFINE BOUNDARIES



Beuthien Nett
575 PRESIDENT AVENUE
SUTHERLAND NSW 2232
Ph: 9545 5909
Fax: 9545 5908
surveyor@bdn.net.au
ABN 69 074 616 087

PLAN SHOWING POSITION & HEIGHTS OF MONITORING WELL SITES AT
24 DAVIS ROAD
WETHERILL PARK

A3
1:1000
units=metres

ORIGIN OF COORDS: SSM 42224 & SSM 75573
GRID: AUSTRALIAN MAP GRID (AMG)

ORIGIN OF HEIGHTS: SSM 44159 (RL 51.143)
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)

INSTRUMENT: LEICA TC 1010 TOTAL STATION

SURVEYOR REGISTERED UNDER THE SURVEYING ACT, 2002

OUR REFERENCE: 9406 SURVEY DATE: 18/8/05

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW01

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	11:00	11:15
Bore Depth (mbTOC)	6.01	6.03
- SWL (mbTOC)	3.31	dry
2.70 x L/m	4	
= Bore Vol	11 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:29	
Bore Depth (mbTOC)	6.00	
- SWL (mbTOC)	3.36	DRY
x L/m	2.64	
= Bore Vol	11 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1:37	10		3.60	11.16mS	7.15	237	20.5	Brown; mod Turb.	0	0	0	0
	20	3.79ppm	[illegible]	5.14mS	6.81	236	20.0	" "				
12:15	Sample		5.74	1037	6.90	222	19.0	Turbid; Brown				

14/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	12:02	
SWL	3.36	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW01 - 19/8/05	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW02

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	11:15	
Bore Depth (mbTOC)	6.75	
- SWL (mbTOC)	3.07	dry
3.68 x L/m	4	
= Bore Vol	15	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 10L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GRS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:50p	
Bore Depth (mbTOC)	6.75	
- SWL (mbTOC)	3.15	DRY
x L/m	3.6	
= Bore Vol	15L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
2:00	10L		3.74	8.98mS	7.23	211	21.9	Clear to Slight Turbidity	0	0	0	0
1:00	Sample		4.83	1062	6.99	235	20.1	Cloudy.				

19/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	1:00	
SWL	4.80	

Sample ID	Container type and size: TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW02-19/8/05	2	1	1	1		1	1	1		8
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW03

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:40	10:50
Bore Depth (mbTOC)	6.70	6.73
- SWL (mbTOC)	3.70	Dry.
3 x L/m	4	
= Bore Vol	12 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 11L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1:13	
Bore Depth (mbTOC)	6.7	
- SWL (mbTOC)	3.74	
x L/m	3	
= Bore Vol	12 L.	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level None mbTOC
Comments Dry @ 10L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1:20	10L		3.07	23.82mS	6.97	227	21.9	Slight Turbid Brown	0	0	0	0
19/8/05 11:56	Sample		3.86	979µS	6.99	222	20.1	Clear ; to Slightly Turbid				

Sampling

Date 18 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	1:45	
SWL		

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW03_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW04

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9.50	
Bore Depth (mbTOC)	6.81	
- SWL (mbTOC)	3.49	
3.32 x L/m	4	
= Bore Vol	12	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 15L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								brown, silty. no odour				

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	2:45	
Bore Depth (mbTOC)	6.81	
- SWL (mbTOC)	8.585	DRY
x L/m	3.222	
= Bore Vol	13L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 13L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
2:54	10		21.67	2146µs	6.96	223	22.8	Brown Turbid	0	0	0	0
19/8/05 11:35	Sample		3.36	959	6.74	224	21.5	Brown Turb.				

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	12:10	
SWL	3.64	

	Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size		2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
		H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
		Maroon	Yellow	Red	White	Green	White	White	White		
Primary	MW04 - 19/8/05	2	1	1	1		1	1	1		8
Duplicate	04 QC01	2	1	1	1		1	1	1		8
Triplicate	QC02	2	1	1	1		1	1	1		8

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW05

Project No 51556- Project Name Location

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:05	10:15
Bore Depth (mbTOC)	6.78	
- SWL (mbTOC)	3.63	Dry.
3.15 x L/m	4	
= Bore Vol	12	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments dry @ 13L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
								brown, turbid, no odour

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	2:32	
Bore Depth (mbTOC)	6.78	
- SWL (mbTOC)	3.77	10L
x L/m		
= Bore Vol	12L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 10L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
~~Read~~ 2:37	10L		1.88ppm	948	6.98	232	24.6	Brown & Turbid
19/8/05 1100	Sample		3.28	1022	6.78	225	21.7	Brown Turbid

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:55	
SWL	3.95	

Sample ID	TPH/BTEX VHC (2x40ml Vial(G) H2SO4 Maroon)	TPH, Phenols, PAH, OCOP (1L (G) Nil Yellow)	Metals (250 ml (P) HNO3 Red)	Ferrous Fe (250 ml (P) HCL White)	Water Qual (250 ml (P) Nil Green)	TOC, SO4 (250 ml (P) HCL White)	TOC, SO4 (40 ml Vial(G) Nil White)	Methane (40 ml Vial(G) Nil White)	Other	Total
Primary MW05_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Container type and size

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW06

Project No 51556- Project Name CSR Enderm Location @ Wetherill Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9.30	9.40
Bore Depth (mbTOC)	6.84	6.85
- SWL (mbTOC)	2.44	Dry
4.40 x L/m		
= Bore Vol	18L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								brown, turbid no odour grey-				

Purging

MW08

Date 18 / 8 / 05
Developed by: QVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:10	
Bore Depth (mbTOC)	7:00	
- SWL (mbTOC)	0.63	DRY
x L/m	6.37	
= Bore Vol	26L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 30L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
3:25	20L		5.39	1216	7.75	189	20	Brown Slight Turbid	0	0	0	0
	30L		3.82	1381	7.46	201	20.5					
10:45	Sample		3.29	1005	6.88	216	19.3	Grey Brown Slightly turbid				

MW06 19/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:45	
SWL	2.59	

Container type and size

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW06_19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW07

Project No 51556-   Project Name CSP Emulsions   Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: new

Well Size	50 mm (circled)	100 mm
L/m	4	9

	Start	End
Time	9am	9.05
Bore Depth (mbTOC)	6.73	6.75
- SWL (mbTOC)	1.76	Dry
4.97 x L/m	204	
= Bore Vol	20L	

Development Method: Bailer (circled) / Footvalve / Other
Discharge Rate ______ L/min
Volume Removed ______ L/min
PSH Level ______ mbTOC
Comments: Dry at 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								grey-brown, turbid, no odour				

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4 (circled)	9

	Start	End
Time	12:30	
Bore Depth (mbTOC)	6.73	
- SWL (mbTOC)	1.92	DRY
x L/m	4.78	
= Bore Vol	20L.	

Development Method: Bailer (circled) / Footvalve / Other
Discharge Rate ______ L/min.
Volume Removed ______ L/min
PSH Level ______ mbTOC
Comments: Dry @ 20L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
12:35	10		2.81	12.11uS	6.97	241	18.8	Cloudy, Slightly Turbid	0	0	0	0
12:40	20		2.88	12.69uS	7.13	244	19.3	"				
19/8/05 10:35	Sample		4.91	1016uS	6.92	224	19.1	Clear; Slight Turb.				

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method: Bailer (circled) / Other

	Start	End
Time	10:25	
SWL	3.21	

Container type and size

	Sample ID	TPH/BTEX VHC 2x40ml Vial(G) H2SO4 Maroon	TPH, Phenols, PAH, OCOP 1L (G) Nil Yellow	Metals 250 ml (P) HNO3 Red	Ferrous Fe 250 ml (P) HCL White	Water Qual 250 ml (P) Nil Green	TOC, SO4 250 ml (P) HCL White	TOC, SO4 40 ml Vial(G) Nil White	Methane 40 ml Vial(G) Nil White	Other	Total
Primary	MW07	2	1	1	1		1	1	1		8
Duplicate											
Triplicate											

Comments ______

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW06 ~~MW08~~

Project No 51556- Project Name CSR Location W. Park

Development

Date 10 / 8 / 05
Developed by: Erin
Well head condition: ~~[illegible]~~ destroyed. well cover removed

Well Size	50 mm (circled)	100 mm
L/m	4	9

	Start	End
Time		
Bore Depth (mbTOC)	7-00	
- SWL (mbTOC)	0-63	
x L/m		
= Bore Vol		

Development Method (Bailer circled) / Footvalve / Other
Discharge Rate ____ L/min
Volume Removed ____ L/min
PSH Level ____ mbTOC
Comments Dry @ 32L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

MW06

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4 (circled)	9

	Start	End
Time	2:05pm	
Bore Depth (mbTOC)	7.00	
- SWL (mbTOC)	2.52	DRY
x L/m	4.48	
= Bore Vol	18 L	

Development Method (Bailer circled) / Footvalve / Other
Discharge Rate ____ L/min
Volume Removed ____ L/min
PSH Level ____ mbTOC
Comments DRY @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
2:19	15L		1.57	841µS	7.06	221	24.2	Brown High turbidity	0	0	0	0
1:20	Sample		4.72	1269	7.46	149	16.6	Clear				

MW08 19/8/05

Sampling

Date 19 / 8 / 05
Sampled by:
Sampling Method (Bailer circled) / Other

	Start	End
Time	1:20	
SWL	0.98	

Container type and size

	Sample ID	TPH/BTEX VHC 2x40ml Vial(G) H2SO4 Maroon	TPH, Phenols, PAH, OCOP 1L (G) Nil Yellow	Metals 250 ml (P) HNO3 Red	Ferrous Fe 250 ml (P) HCL White	Water Qual 250 ml (P) Nil Green	TOC, SO4 250 ml (P) HCL White	TOC, SO4 40 ml Vial(G) Nil White	Methane 40 ml Vial(G) Nil White	Other	Total
Primary	MW08_19/8/05	2	1	1	1		1	1	1		8
Duplicate											
Triplicate											

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW09

Project No 51556- Project Name CSR Location W. Park

Development

Date 9/8/05
Developed by: EAN
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:50	
Bore Depth (mbTOC)	10.08	
- SWL (mbTOC)	2.63	DRY
7.45 x L/m	4	
= Bore Vol	34L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 50L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18/8/05
Developed by: GVS
Well head condition: GOOD

Well Size.	50 mm	100 mm
L/m	(4)	9

	Start	End
Time	10:25	
Bore Depth (mbTOC)	10.00	
- SWL (mbTOC)	2.68	DRY
x L/m	7.32	
= Bore Vol	30L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments DRY @ 40L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
10:30	20	~~Good~~	6.06	1827	7.05	211	19.7	Turbid Grey Brown	0	0	0	0
10:40	40L		5.11	4.61mS	7.19	225	19.7	Turbid Grey Brown	0	0	0	0
10:5	Sample		6.71	874	7.23	173	20.3	Clear / Slightly Cloudy	~~0~~	~~0~~	—	—

19/8/05

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:05.	
SWL	2.69	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
Container type and size	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW09-19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

Confidential – Subject to Legal Professional Privilege

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW10

Project No 51556- Project Name CSR Emoleum Location Westmoill Park

Development

Date 9/8/05
Developed by: Erin
Well head condition: New -

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	3:20	
Bore Depth (mbTOC)	9.71	
- SWL (mbTOC)	3.03	DRY
6.68 x L/m	26	
= Bore Vol	26	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 20L. Bailer dropped in well - not yet retrieved !!

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL

Purging

Date 18/8/05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	10:49	
Bore Depth (mbTOC)	9.70	
- SWL (mbTOC)	3.065	DRY
x L/m	6.635	
= Bore Vol	27L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments & retrieved lost Bailer !! Dry @ 25L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)
11:05	10L		6.55	2.65mS	7.26	206	20.1	V. Turbid / Brown
	20		3.52	2.57mS	7.20	211	20.1	" "
19/8/05 10:00	Sample		6.02	1226µS	7.27	180	21.4	Turbid / Sl cloudy

OVA Monitoring - PID (ppm) / LEL (%)

Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
0	0	0	0

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	10:55	
SWL	4.61m	

Sample ID	TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	Container type and size									
	2x40ml Vial(G) + H2SO4	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	Maroon	Yellow	HNO3	HCL	Nil	HCL	Nil	Nil		
			Red	White	Green	White	White	White		
Primary MW10-19/8/05	2	1	1							4
Duplicate										
Triplicate										

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW11

Project No 51556- Project Name CSR Emoleum Location Wetherill Park

Development

Date 9 / 8 / 05
Developed by: Erin
Well head condition: new.

Well Size	50 mm (circled)	100 mm
L/m	4 (circled)	9

	Start	End
Time	3.00	3.05
Bore Depth (mbTOC)	9.75	9.75
- SWL (mbTOC)	4.91	DRY
4.84 x L/m	4	
= Bore Vol	20	

Development Method (Bailer circled) / Footvalve / Other
Discharge Rate ____ L/min
Volume Removed ~~18~~ 5 L/min
PSH Level ____ mbTOC
Comments Dry @ 18L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								grey silty, no odour.				

Purging

Date 18 / 8 / 05
Developed by: GVS
Well head condition: GOOD

Well Size	50 mm	100 mm
L/m	4 (circled)	9

	Start	End
Time	11:25	
Bore Depth (mbTOC)	9.75	
- SWL (mbTOC)	5.42	DRY
x L/m	4.33	
= Bore Vol	17.32	

Development Method (Bailer circled) / Footvalve / Other
Discharge Rate ____ L/min
Volume Removed ____ L/min
PSH Level ____ mbTOC
Comments Dry @ 15L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
~~10~~ 11:32	~~6~~	~~8.28~~	~~5.10~~	~~7.0~~	~~[illegible]~~							
	10		5.28	5.10	7.01	258	19.7	Slightly Turbid / Grey.	0	0	0	2
	15L		4.99	6.13	6.88	236	19.8	Turbid / Grey				
19/8/05 9:44	Sample		2.09	1238	6.74	217	19.6	Slight Turbid / Grey				

Sampling

Date 19 / 8 / 05
Sampled by:

Sampling Method (Bailer circled) / Other

	Start	End
Time	9:44	
SWL		

Container type and size

	Sample ID	TPH/BTEX VHC 2x40ml Vial(G) H2SO4 Maroon	TPH, Phenols, PAH, OCOP 1L (G) Nil Yellow	Metals 250 ml (P) HNO3 Red	Ferrous Fe 250 ml (P) HCL White	Water Qual 250 ml (P) Nil Green	TOC, SO4 250 ml (P) HCL White	TOC, SO4 40 ml Vial(G) Nil White	Methane 40 ml Vial(G) Nil White	Other	Total
Primary	MW11_19/8/05	2	1	1							4
Duplicate											
Triplicate											

Comments

URS BORE DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE ID: MW12

Project No 51556- Project Name CSR Emoleum Location Wetherill Park

Development

Date 9/8/05
Developed by: ENN
Well head condition: new

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	1.30	1.32
Bore Depth (mbTOC)	9.79	
- SWL (mbTOC)	3.36	DRY.
6 -43 x L/m	25	
= Bore Vol	25	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level mbTOC
Comments Dry @ 30L.

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
								light brown, turbid, no odour				

Purging

Date 8/8/05
Developed by: GVS
Well head condition: Good

Well Size	50 mm	100 mm
L/m	4	9

	Start	End
Time	9:40	10:15
Bore Depth (mbTOC)	9.70	
- SWL (mbTOC)	3.535	DRY
x L/m	6.165	
= Bore Vol	25 L	

Development Method Bailer / Footvalve / Other
Discharge Rate L/min
Volume Removed L/min
PSH Level None mbTOC
Comments Dry @ 30L

Field Analyses

Time	Vol Removed (L)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	EC (uS/cm)	pH	Redox (mV)	T (C)	Comments (Color, turbidity)	OVA Monitoring - PID (ppm) / LEL (%) Well Head PID / LEL	OBZ PID / LEL	Bucket PID / LEL	Ambient PID / LEL
1000	10		3.28	1167	6.26	282	19.11	Sl Turbid Grey Brown	0	0	0	0
10:10	20		3.14	1112	6.65	246	20.6	Turbid, Grey Brown				
10:15	30		2.96	1167	6.82	231	19.5	V. Turbid, Brown				
9:28	sample		5.89	1233	7.14	211	20.00	Turbid ; Brown				

19/8/05

Sampling

Date 19/8/05
Sampled by:
Sampling Method Bailer / Other

	Start	End
Time	9:28	
SWL		

Sample ID	Container type and size: TPH/BTEX VHC	TPH, Phenols, PAH, OCOP	Metals	Ferrous Fe	Water Qual	TOC, SO4		Methane	Other	Total
	2x40ml Vial(G)	1L (G)	250 ml (P)	250 ml (P)	250 ml (P)	250 ml (P)	40 ml Vial(G)	40 ml Vial(G)		
	H2SO4	Nil	HNO3	HCL	Nil	HCL	Nil	Nil		
	Maroon	Yellow	Red	White	Green	White	White	White		
Primary MW12-19/8/05	✓	✓	✓	✓		✓	✓	✓		16
Duplicate Xtra Volume for lab QC										
Triplicate										

Comments

Table 3: Well Construction and Groundwater Gauging Summary
Mobil Oil Australia Pty Ltd
Mobil - Wetherill Park
Job Numer: 42424444

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH Thickness (m)	Depth of Screen Top mbgl	Depth of Screen Top mAHD	Depth of Screen Bottom mbgl	Screen Length m	lithology
MW01	26/06/2012	6.01	36.50	2.79	33.71	0.00	3.00	33.50	6.00	3.00	clayey shale
MW02	26/06/2012	6.50	36.97	2.33	34.64	0.00	1.00	35.97	7.00	6.00	clay and clayey shale, shale
MW03	26/06/2012	6.69	37.79	3.00	34.79	0.00	2.00	35.79	7.00	5.00	clayey shale
MW04	26/06/2012	6.81	39.01	2.96	36.05	0.00	1.00	38.01	7.20	6.20	clay and clayey shale, shale
MW05	26/06/2012	6.70	39.20	3.07	36.13	0.00	1.00	38.20	7.00	6.00	clay and then a clayey shale and shale
MW06	26/06/2012	6.84	39.31	2.02	37.29	0.00	1.00	38.31	7.00	6.00	clay and then a clayey shale and shale
MW07	26/06/2012	6.70	39.26	1.35	37.91	0.00	1.00	38.26	7.20	6.20	clay and then a clayey shale and shale
MW08	26/06/2012	7.00	43.43	0.15	43.28	0.00	1.50	41.93	7.50	6.00	clayey shale and shale
MW09	26/06/2012	10.00	45.57	1.93	43.65	0.00	4.00	41.57	10.20	6.20	shale
MW10	26/06/2012	9.69	46.02	2.51	43.51	0.00	4.00	42.02	10.20	6.20	shale
MW11	26/06/2012	9.73	46.84	2.87	43.97	0.00	4.00	42.84	10.20	6.20	shale
MW12	26/06/2012	9.70	46.38	2.74	43.64	0.00	4.00	42.38	10.00	6.00	clayey gravelly silt, weathered siltstone, shale
MW13	26/06/2012	5.18	46.65	2.41	44.25	0.00	2.50	44.15	5.50	3.00	silty clay, sandy clay

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum

Table 4: Groundwater Field Parameters
Mobil Oil Australia Pty Ltd
Mobil - Wetherill Park
Job Numer: 42424444

Well ID	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	26/06/2012	35574	21344	6.56	0.44	18.8	232	Clear.
MW02	27/06/2012	18218	10931	6.61	3.30	19.7	229	Clear. Purged dry after 17L
MW03	27/06/2012	20080	12048	6.54	1.30	20.5	233	Clear, slightly turbid. Purged dry after 16L
MW04	26/06/2012	21198	12719	6.47	0.94	22.7	237	Clear, slightly turbid.
MW05	27/06/2012	20697	12418	6.58	1.38	23.4	231	Clear, slightly turbid. Purged dry after 15L
MW06	27/06/2012	21563	12938	6.69	2.61	22.2	225	Clear, slightly turbid. Purged dry after 18L
MW07	27/06/2012	20246	12148	6.80	4.50	20.4	218	Clear, slightly turbid. Purged dry after 7L
MW08	27/06/2012	1575	945	7.52	6.77	19.6	172	Grey, turbid. Purged dry after 35L
MW09	27/06/2012	1167	700	7.16	5.26	21.5	198	Grey, silty.
MW10	27/06/2012	2081	1249	7.19	6.12	21.7	197	Brown, turbid. Purged dry after 25L
MW11	27/06/2012	4642	2785	7.05	7.34	20.3	206	Grey turbid. Purged dry after 20L
MW12	27/06/2012	6998	4199	6.55	0.40	22.0	228	Brown, turbid.
MW13	27/06/2012	1400	840	7.03	0.49	20.4	206	Clear, turbid.

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
Temp - Temperature

Table 1
Well Construction and Groundwater Gauging Summary
Former Emoleum Wetherill Park GME 2010

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH [4] Thickness (m)
MW01	16/03/2010	6.00	36.50	3.07	33.43	ND
MW02	16/03/2010	6.50	36.97	2.68	34.29	ND
MW03	16/03/2010	6.70	37.79	3.30	34.49	ND
MW04	16/03/2010	6.80	39.01	2.86	36.15	ND
MW05	16/03/2010	6.70	39.20	3.03	36.17	ND
MW06	16/03/2010	7.00	39.31	2.03	37.28	ND
MW07	16/03/2010	6.70	39.26	0.64	38.62	ND
MW08	16/03/2010	7.00	43.43	0.47	42.96	ND
MW09	16/03/2010	10.00	45.57	2.34	43.23	ND
MW10	16/03/2010	9.70	46.02	2.72	43.30	ND
MW11	16/03/2010	9.75	46.84	3.23	43.61	ND
MW12	16/03/2010	9.70	46.38	3.15	43.23	ND
MW13	16/03/2010	5.17	46.65	3.14	43.51	ND

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. mAHD - metres Australian Height Datum
4. PSH - Phase Seperated Hydrocarbons

ND - Not Detected

Table 2
Groundwater Field Parameters
Former Emoleum Wetherill Park GME 2010

Well ID	Date	Electrical Conductivity uS/cm	Total Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	16/03/2010	31900	19140	6.93	5.09	20.3	299	Yellowish brown, slightly turbid, no odour or sheen. Dry after 36 L.
MW02	17/03/2010	23861	14317	7.15	0.86	21.1	160	Black, slightly turbid, organic odour. 16/03/10 Well was blocked by tree roots and only 3L of water was purged out. 17/03/10 Unblocked and purged dry after 10 L.
MW03	16/03/2010	18789	11273	7.02	2.68	21.8	223	Grey, clear, dry after 13L.
MW04	16/03/2010	20926	12556	6.77	3.34	24.4	272	Yellowish brown, turbid, no odour or sheen. Dry after 16L.
MW05	16/03/2010	19094	11456	6.85	2.65	24.3	256	Yellowish brown, turbid, no odour or sheen. Dry after 12L.
MW06	16/03/2010	15491	9295	7.05	2.90	22.9	210	Dark brown, slightly turbid, no odour or sheen. Dry after 20L.
MW07	16/03/2010	18752	11251	6.89	3.41	22.2	235	Dark brown, slightly turbid, no odour or sheen. Dry after 28L.
MW08	16/03/2010	6899	4139	7.49	3.26	21.7	268	Brown-grey, trubid, no odour or sheen. Dry after 35L.
MW09	16/03/2010	1704	1022	7.50	3.85	22.5	299	Dark brown, turbid, no odour or sheen. Dry after 30L.
MW10	16/03/2010	7985	4791	7.29	3.82	22.2	311	Slighlty dark brown, turbid, no odour or sheen. Dry after 26L.
MW11	16/03/2010	4973	2984	7.27	3.90	20.7	282	Light brown, slightly turbid, no odour or sheen. Dry after 22L.
MW12	16/03/2010	6532	3919	6.83	3.54	23.0	307	Yellowish brown, turbid, no odour or sheen. Dry after 30L.
MW13	16/03/2010	1420	852	7.28	2.90	23.1	296	Yelowish brown, slightly turbid, no odour or sheen.

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved oxygen
Temp - Temperature
uS/cm - Microsiemens per centimetre
ppm - Parts per million
mV - Millivolts
°C - Celsius degree

Table 1
Well Construction and Groundwater Gauging Summary
Former Emoleum Wetherill Park GME 2008

WELL ID	Date Gauged	Total Depth (mTOC [2])	TOC (mAHD [3])	SWL [1] (mTOC [2])	Groundwater Elevation (mAHD)	PSH Thickness (m)
MW01	21/10/2008	6.00	36.50	3.03	33.47	nil
MW02	21/10/2008	6.50	36.97	2.65	34.32	nil
MW03	21/10/2008	6.70	37.79	3.34	34.45	nil
MW04	21/10/2008	6.80	39.01	3.01	36.00	nil
MW05	21/10/2008	6.70	39.20	3.15	36.05	nil
MW06	21/10/2008	7.00	39.31	1.98	37.33	nil
MW07	21/10/2008	6.70	39.26	1.23	38.03	nil
MW08	21/10/2008	7.00	43.43	0.21	43.22	nil
MW09	21/10/2008	10.00	45.57	2.13	43.44	nil
MW10	21/10/2008	9.70	46.02	2.72	43.30	nil
MW11	21/10/2008	9.75	46.84	2.97	43.87	nil
MW12	21/10/2008	9.70	46.38	2.70	43.68	nil
MW13	21/10/2008	5.17	46.65	2.97	43.68	nil

Notes:
1. SWL - Standing Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum

Table 2
Groundwater Field Parameters
Former Emoleum Wetherill Park GME 2008

Well ID	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp °C	Redox Potential (Eh) [2] mV	Description
MW01	21/10/2008	36300	21780	6.77	5.36	18.6	392	Brown, turbid
MW02	21/10/2008	14920	8952	6.87	0.67	18.3	133	Grey, thick, turbid
MW03	21/10/2008	23000	13800	7.01	2.65	19.9	197	Brown, turbid
MW04	21/10/2008	20190	12114	6.84	9.17	21.4	281	Brown/grey, turbid
MW05	21/10/2008	19810	11886	6.93	3.71	21.4	283	Brown, turbid
MW06	21/10/2008	14680	8808	7.44	5.38	19.7	249	Brown/grey, turbid
MW07	21/10/2008	20660	12396	7.01	3.25	19.3	212	Light brown/grey
MW08	21/10/2008	5710	3426	7.27	3.64	19.3	363	Grey, turbid
MW09	21/10/2008	3130	1878	7.16	3.61	21.2	322	Grey, silty
MW10	21/10/2008	10070	6042	7.11	4.43	21.1	295	Grey/brown, turbid
MW11	21/10/2008	6990	4194	7.01	4.46	19.9	389	Grey/brown, turbid
MW12	21/10/2008	6120	3672	6.91	3.79	21.2	427	Brown, turbid, dry after 25L
MW13	21/10/2008	1562	937	7.53	3.82	18.3	366	Brown, turbid

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
Temp - Temperature

Table 6
Groundwater Gauging Summary
Mobil Emoleum Wetherill Park P2 ESA

WELL ID	Total Depth (mTOC [2])	SWL [1] (mTOC [2])	TOC (mAHD [3])	SWL (mAHD)	PSH (m)
MW01	6.00	3.36	36.50	33.14	nil
MW02	6.75	3.15	36.97	33.82	nil
MW03	6.70	3.74	37.79	34.05	nil
MW04	6.81	3.59	39.01	35.42	nil
MW05	6.78	3.77	39.20	35.43	nil
MW06	7.00	2.52	39.31	36.79	nil
MW07	6.73	1.92	39.26	37.34	nil
MW08	7.00	0.63	43.43	42.80	nil
MW09	10.08	2.68	45.57	42.89	nil
MW10	9.71	3.07	46.02	42.95	nil
MW11	9.75	5.42	46.84	41.42	nil
MW12	9.79	3.54	46.38	42.85	nil
MW13*	5.10	3.45	46.65	43.20	nil

Notes:
1. SWL - Static Water Level
2. TOC - Top of Casing
3. AHD - Australian Height Datum
* Data collected on 25 August 2005

Table 7
Groundwater Water Quality Parameters
Mobil Emoleum Wetherill Park P2 ESA

	Date	Electrical Conductivity uS/cm	Tot. Dissolved Solids (TDS) [1] mg/L	pH	DO (ppm)	Temp `C	Redox Potential (Eh) [2] mV	Description
MW01	18/08/2005	5140	3084	6.81	3.79	20.0	236	Moderate turbidity, brown
MW02	18/08/2005	8950	5370	7.23	3.74	21.9	211	Slight turbidity
MW03	18/08/2005	2382	1429	6.97	3.07	21.9	227	Slight turbidity, brown
MW04	18/08/2005	2146	1288	6.96	1.67	22.8	223	Turbid, brown
MW05	18/08/2005	948	569	6.98	1.88	24.6	232	Slight turbidity, brown
MW06	18/08/2005	841	505	7.06	1.57	24..2	221	High turbidity brown
MW07	18/08/2005	1269	761	7.13	2.88	19.3	244	Slight turbidity
MW08	18/08/2005	1381	829	7.46	3.82	20.5	201	Slight Turbidity, brown
MW09	18/08/2005	4610	2766	7.19	5.11	19.7	225	Turbid, grey
MW10	18/08/2005	2570	1542	7.20	3.52	20.1	211	High Turbidity brown
MW11	18/08/2005	6130	3678	6.88	4.99	19.5	236	Turbid, grey
MW12	18/08/2005	1167	700	6.82	2.96	19.5	231	Turbid, brown
MW13*	25/08/2005	1707	1024	7.13	4.42	18.3	149	Turbid, orange brown

Notes:
1. TDS as approximation converted from Electrical Conductivity x 0.6
2. Redox Potential measured with a platinum electrode and silver/silver chloride reference electrode (Er) and converted to Eh by Eh = Er + 230 mV.
DO - Dissolved Oxygen
* Data collected on 25 August 2005

Appendix D

Photographs

Photograph 1 - Upper Level

Photograph 2 - Middle Level

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D1 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 3 - Internal road on west of property

Photograph 4 - Adjacent scrap metal facility

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D2 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 5 - Lower level

Photograph 6 - Recycled water tanks

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D3 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016

Photograph 7 - Unnamed tributory of Prospect Creek at Elizabeth Street

Photograph 8 - Prospect Creek at Reconciliation Drive

Douglas Partners Geotechnics | Environment | Groundwater	**Site Photographs** **Proposed Resource Recovery & Recycling Centre** **24 Davis Road, Wetherill Park**	PROJECT: 85126.01 PLATE No: D4 REV: A
	CLIENT: Bettergrow Pty Ltd	DATE: Mar 2016