ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

PROJECT NO. **210074**

APRIL 2011 GROUNDWATER INVESTIGATIONS AT FORMER SOUTH MELBOURNE GASWORKS

ENVIRONMENTAL EARTH SCIENCES VIC
REPORT TO CITY OF PORT PHILLIP
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EXECUTIVE SUMMARY

Background

In April 2011, Environmental Earth Sciences VIC undertook a further groundwater investigation at the former South Melbourne Gasworks on behalf of City of Port Phillip (CoPP). The site is currently undergoing a two stage 53V audit commissioned by Council to assess risks of harm posed by the site. The first stage of the 53V audit was undertaken by Dr. Peter Nadebaum of GHD in December 2008 and involved undertaking a '*preliminary assessment of available information regarding risks associated with groundwater and soil contamination to determine what further investigation and remediation works would be required to complete the audit*'.

As detailed in the audit report, further environmental investigation and monitoring works are required to address the higher risk issues identified at the site, determine requirements for remediation and the site's suitability for future land uses.

The objectives of this groundwater investigation were to gain an improved understanding of hydrogeological and hydro-geochemical data related to the site and investigate the sources for the contaminants of potential concern (CoPCs) detected in the groundwater. The data and observations noted during this groundwater investigation will assist to address the higher risk issues identified at the site.

Field work as part of this groundwater investigation (on- and offsite) included:

- a groundwater gauging round, including the recording of groundwater standing water levels (SWLs), assessment of the presence of non-aqueous phase liquids (NAPL) and well serviceability checks;
- the installation of five shallow and three deep groundwater wells;
- development of all onsite and offsite groundwater wells, including existing and newly installed wells;
- the collection of groundwater samples from thirty one (31) existing groundwater wells and eight recently installed wells for laboratory analysis of chemicals of concern (CoC), following adequate purging, stabilisation and recording of field parameters; and
- evaluation of aquifer properties via estimates of physical parameters by slug tests (i.e. rising and falling head tests) selectively undertaken on six groundwater wells.

Groundwater flow system

The local hydrostratigraphy consists of Brighton Group sediments (BG) overlying Older Volcanics basalts. Groundwater flow through the full saturated thickness of the BG is controlled by deep sewers which border the site on three sides. The water table on site is drawn down several metres below its natural level by the sewers such that it is several metres below sea level throughout the area of the site and the surrounding vicinity.

The groundwater flow system through the BG on site is interpreted to have the following additional characteristics:

- nearly all of the groundwater flow in the BG beneath the site originated as on-site recharge;
- there is an upward gradient from the OVB to the BG. Due to this gradient, contaminated groundwater cannot migrate downwards but there may be some minor

upward leakage; however, this flux is considered to be small in comparison to the flux derived from on-site recharge;

- all the groundwater discharging from the site is captured by the sewers;
- lateral groundwater flow towards the sewers takes place through the full 10-m saturated thickness of the BG. However, the greatest lateral flux takes place through the layers of greatest hydraulic conductivity (K);
- the oldest groundwater within the BG on site is likely to be close to the sewers, within the relatively low K zones of the BG, and/or in areas of relatively low hydraulic gradient;
- the median K of the BG at the site was evaluated from slug tests to be approximately 0.3 m/day; and
- the average linear velocity of the groundwater flowing laterally through the BG over most of the site is estimated to be approximately 5 m/yr.

The total flux of groundwater from the site to the surrounding sewers from Gasworks Park and Southport Community Nursing Home is estimated to be approximately 11 m3/day, (4 ML/yr). The average recharge rate across the site was estimated to be approximately 0.1 m/yr.

Groundwater contamination

Groundwater at the site is impacted with common gasworks contaminants, including heavy metals (primarily arsenic [As], cobalt [Co], copper [Cu], lead [Pb] and zinc [Zn]), ammonia (NH_4^+), cyanide (CN), sulfate (SO_4^{2-}), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs) and monocyclic aromatic hydrocarbons (MAHs). However, there is no evidence of either dense NAPL (DNAPL) or light NAPL (LNAPL).

The vertical and lateral distribution of the groundwater contamination is consistent with the former gasworks infrastructure and the physical groundwater flow system. The greatest concentrations of total dissolved solids (TDS), SO_4^{2-}, NH_4^+, CN and many organics in 2011 were detected in monitoring wells screened in the lower BG near the site perimeter in the vicinity of former gas purifiers. This contamination is interpreted to have originated on site. The groundwater in the BG is not interpreted to have been significantly impacted by the upwelling of higher salinity groundwater via the underlying OVB.

The relatively low contaminant concentrations towards the centre of the site, in comparison to the site perimeter, could be due to less contamination originating from the central part of the site but may also reflect some flushing of the on-site flow system with less contaminated recharge since the site ceased to operate as a gasworks in 1971.

As all the groundwater migrating from the site is captured by the sewers, all the dissolved contaminants are also captured by the sewers. For the most part, the contaminated groundwater from the site migrates directly to the sewers without passing beneath neighbouring properties. However, there is an area to the northeast of Richardson Street where a plume of the NH_4^+ and SO_4^{2-} contamination that migrates beneath up to 18 properties en route to the South Yarra Sewer Main beneath Bridport Street. Relatively high concentrations of CN and PAHs have also been detected in groundwater samples from this area. Although the current groundwater flow direction is interpreted to be parallel to, rather than across, Richardson Street, the Gasworks site is considered likely to be the original source of this area of groundwater contamination.

Elevated concentrations of PAHs were also detected within newly installed groundwater wells in an area of very low hydraulic gradient in the northern part of the site. Based largely on the low hydraulic gradient in this area, it is considered unlikely that contaminated groundwater at Gasworks Park would migrate to the north west beneath the neighbouring Alinta Site and present a risk to off-site users.

Potential beneficial uses

Based on TDS values south east of the site and in this general region, the groundwater has been classified as 'Segment A_2', with a TDS range of 501-1,000 mg/L. However, the quality of some of the non-impacted groundwater in the vicinity of the site does not support some of the protected beneficial uses.

In this urban environment with a municipal reticulated water supply, the potential beneficial uses of potable water and mineral water supply are not considered to be realistic potential beneficial uses. However, the Victorian Groundwater Database shows that some wells have been installed in the area for stock/domestic and irrigation purposes.

As all contaminants being transported in groundwater from the site are captured by the sewer system, there is currently negligible risk of impacted groundwater from Gasworks Park discharging to receiving waters (i.e. ecosystems) in the vicinity of the site.

As the site is owned by the City and the State of Victoria and the groundwater is known to be contaminated, the abstraction of groundwater onsite for any purpose is being controlled by an ICMP. Therefore, on site, the above potential beneficial uses, with the exception of buildings and structures, are considered to be precluded.

In the area of gasworks-related groundwater contamination beneath private residences to the northeast of Richardson Street and northwest of Bridport Street, the abstraction of groundwater is not currently prevented. Although the BG in this area has a particularly low potential yield due to a limited saturated thickness, the potential beneficial uses of primary contact recreation, irrigation and stock/domestic cannot be discounted in this area.

Risks associated with the groundwater contamination

As all the groundwater flowing from the site is captured by the sewer system, it is ultimately pumped to the Werribee Treatment Plant. The flux of groundwater from the site is several orders of magnitude less than the total flow rate of sewage through the sewers to the Werribee Treatment Plant. Therefore, contaminant concentrations are diluted by several orders of magnitude. Therefore, associated risks to workers at the treatment plant would be very low. Furthermore, the personal protective equipment routinely used in the sewers themselves would protect workers from any additional contaminants introduced into the sewers from the site.

Even if all the sewers in South Melbourne were sealed, such that the natural groundwater flow system to Port Phillip Bay were restored, the hydraulic gradient towards the Bay would be so low that the groundwater would move towards the Bay at a rate that is orders of magnitude less than the current rate of groundwater flow towards the sewers and the travel time would likely be thousands of years. The volumetric rate of discharge to the Bay would, therefore, be very low when the contaminants ultimately reached the Bay.

Risks associated with the area of groundwater contamination to the north east of the site would only apply if the groundwater is extracted. Although the resource is physically limited and groundwater extraction is unlikely, it is not currently prevented in this area.

Recommendations

The requirements of an existing Deed of Agreement between CoPP, Melbourne Water and South East Water include ongoing groundwater monitoring and notification of changes in conditions. Therefore, we recommend a GME takes place during the next several weeks to months, incorporating rationalisation of the wells to be sampled and the suite of analytes.

Additionally, it is recommended that the mass flux of contaminants discharging to the sewers is revisited and the associated very low risk to the sewer system and the treatment plant is confirmed.

We recommend a review of possible management/remediation strategies for the area of groundwater contamination to the north east of the site. This review would include consideration of the potential cost, benefit, duration, practicality, environmental footprint and risks of approaches to remediation in this area, in comparison to the current situation in which all this groundwater is captured by the sewer system.

We recommend that a GQRUZ be considered that would cover the area of interpreted gasworks-related groundwater contamination to the north east of the site. This would cover an area of approximately 20-30 private properties.

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1 INTRODUCTION

The site was formerly the manufacturing area of the South Melbourne Gasworks (SMG), and operated from 1983 to 1995, with some aspects remaining functional until 1977. The site was redeveloped and has been used as a park since the 1980's by the City of Port Phillip (CoPP).

The site is currently managed in accordance with two Interim Contamination Management Plans (ICMPs); one applicable to the Southport Community Nursing Home and the other to the Gasworks Arts Park. The ICMPs are subject to changes and amendments pending further investigation, remediation and/or management.

The site is currently undergoing a two stage 53V audit commissioned by CoPP to assess risks of harm posed by the site. The first stage of the 53V audit was undertaken by Dr. Peter Nadebaum of GHD in December 2008 and involved undertaking a '*preliminary assessment of available information regarding risks associated with groundwater and soil contamination to determine what further investigation and remediation works would be required to complete the audit'*. The findings of the first stage were documented in a report entitled "*Section 53V Environmental Audit – Interim Report*" (December, 2008). As detailed in the audit report, further environmental investigation and monitoring works are required to address the higher risk issues identified at the site, determine requirements for remediation and the sites suitability for future land uses.

Environmental Earth Sciences VIC prepared a scope and methodology for environmental investigational works at the former South Melbourne Gasworks in accordance with information provided within the tender document Sections 3.1 to 3.4 (*Specification*), and in reference to the Auditor's comments detailed in the Interim Audit Report (December 2008).

This scope and methodology was refined once a detailed review of existing site environmental reports and the development of a Sampling and Analysis Plan (SAP) and comments received within GHD 31/26548/189319Letter entitled '*Gasworks Site Environmental Audit Sampling and Analysis Plan*' and SAP discussion between Environmental Earth Sciences VIC, CoPP and GHD on 2 December 2010 and on 12 January 2011

Version 1 of this report (*210074 – South Melbourne Gasworks – GW Report V1*) was issued to the Auditor in August 2011. Round 1 comments regarding Version 1 of the report were received from the Auditor (GHD reference: 31/26548/201840) in November 2011. Environmental Earth Sciences' responses to Round 1 comments were issued in April 2012. Meetings with the Auditor then took place to discuss the round 1 comments and our responses, and the decision was made to review the interpretations in the report and revise the report.

Furthermore, the Auditor issued round 2 comments (in response to our round 1 comments) in June 2012. This document (*210074 – South Melbourne Gasworks – GW Report V2*) presents a revised description and interpretation of the groundwater conditions which considers the issues and comments raised and provided by the Auditor (in round 1 and 2 comments).

The work reported upon in this document has been undertaken in accordance with discussion between Environmental Earth Sciences VIC, the Auditor and CoPP.

Professional judgement was used to extrapolate between inspected areas, however, even under ideal circumstances actual conditions may vary from those inferred to exist. The actual interface between materials and variation in groundwater quality may be more abrupt or gradual than the report indicates. This is described in more detail in Section 10.

2 OBJECTIVES

The objectives of this groundwater investigation are to improve the understanding of hydrogeological and hydro-geochemical data related to the site. The data and observations noted during this groundwater investigation will assist to:

- further characterise and delineate groundwater pollution offsite to the north east;
- identify the potential source(s) of the offsite groundwater pollution;
- investigate if Gasworks Park is a potential source of groundwater pollution offsite towards the Alinta Site (north west);
- determine the aquifer (Brighton Group) physical parameters, particularly with respect to groundwater flux to the sewers;
- further refine/evaluate the validity of the current conceptual site models including relevant beneficial uses of groundwater (groundwater utilisation);
- access the presence of non-aqueous phase liquid (NAPL) in groundwater; and
- access the potential for contamination of deeper groundwater on- and offsite due to onsite pollution.

3 SITE IDENTIFICATION

3.1 Site location

The site is currently owned by CoPP in conjunction with the State of Victoria. The CoPP currently operate as the 'Committee of Management' for the site. The site is situated in Albert Park and is bounded by Graham Street to the south; Pickles Street to the west; Richardson Street to the north; and Foote Street/Bridport Street to the east (refer to Figure 1 and Figure 2).

3.2 Current site uses and condition

The site covers an area of 3.43 hectares (ha) and includes 'Gasworks Arts Park' and 'Southport Community Nursing Home'. Gasworks Arts Park incorporates 2.67 ha of the site, consisting of grassed and landscaped areas, playground, BBQ and rotunda facilities, and small wetlands, all of which are linked by gravel access tracks. Residual gasworks buildings have been retained near the entrance of the park and used as a café, bookshop, art galleries, administration area and theatre, foyer and dressing room area. Other residual gasworks buildings are scattered around the perimeter of the park and used as various art studios:

- the Southport site covers an area of 0.54 ha and is situated in the northeast corner of the SMG site (refer to Figure 2). The Southport Community Nursing Home occupies

the majority of the Southport Site (fronting Richardson Street) and incorporates a brick building (i.e. nursing home), and open grass, paving and landscaped gardens.

- the South Melbourne Gas Regulator Site (i.e. Alinta Site) is situated on the corner Pickles and Richardson Streets and is not included within the investigation area. This area is covered by bitumen hard stand, and is occupied by a brick building in the northern portion of the site, which was a historical part of the original SMG infrastructure. The building housed the regulator station, which controlled pressure in the gas distribution pipes.

3.2.1 Description of local sewer system

Gasworks Park and Southport site are bounded by two major underground sewer mains owned and maintained by Melbourne Water (i.e. South Yarra Main and Hobsons Bay main) and two minor sewer systems owned and maintained by South East Water. The South Yarra main and Hobsons Bay main are situated along Bridport Street and the Graham Street road reserve, respectively. The two minor sewer systems run along Pickles Street and Richardson Street. Details of each sewer are provided below:

South Yarra main sewer is 2.05 m in diameter and is known to have an invert level of RL – 11.22 m Australian Height Datum (AHD) at the intersection of Bridport and Durham Street and decreases to RL -11.28 m AHD at the junction with the Hobsons Bay main at Graham Street.

Hobsons Bay main sewer runs in a general north-western direction along Danks Street, before heading north along Foote Street to Graham Street and the confluence with the South Yarra main. The Hobsons Bay main sewer then continues in a north-western direction along Graham Street to Williamstown Road. It is understood to continue along Williamstown Road to Howe Parade and along Howe Parade under the Yarra River to the former Melbourne Metropolitan Board of Work (MMBW) sewerage pumping station in Newport (now Science Works). Golder Associates indicated that "*along Graham Street in the vicinity of the site, the sewer has a diameter of 2.4 m. The invert level varies from is known to be 2.4 m in diameter and with an invert level ranging from RL – 11.73m near the intersection with Foote Street to – 11.80 m AHD near the intersection with Pickles Street*".

Pickles Street sewer is a brick construction with a known diameter between 0.525 m and 0.6 m. The sewer is at an invert level of RL -8.1 m AHD near the intersection with Hobsons Bay main sewer at Graham Street.

Richardson Street sewer is a concrete construction with a diameter of around 0.225 m and invert level of RL -3.45 m AHD. Additionally the Richardson Street main drain (storm water) owned by Melbourne Water is situated along Richardson Street on the northern boundary of Gasworks Park and crosses Pickles Street at the northern boundary of the Alinta site. The stormwater pipe is a 1.8 metre diameter concrete pipe at an invert level of RL -1.04 at the Pickles Street crossing.

3.2.2 Building design

Buildings were generally noted as being constructed slab on grade with either wooden floors or carpet as a covering layer and brick walls. Buildings were all single level without any basements, with the exception of the gatehouse building which had an open plan mezzanine level. Most original Gasworks buildings were also noted to have air vents at the top of the buildings. In addition most of the buildings are open plan, occasionally with smaller rooms such as toilets, kitchenettes or storage areas.

All buildings on-site with the exception of South Port nursing home and the new administration area are original gasworks buildings.

3.2.3 Surrounding land use

South Melbourne Gasworks is surrounded by low density residential houses to the north and east across Richardson Street and Foote Street. High density residential units are present across Pickles Street to the east, and to the south across Graham Street.

The nearest surface water body to the site is Port Phillip Bay approximately 350 m south of the site (Figure 1).

3.3 Proposed future land use

The CoPP has advised that the desired future land use of both Gasworks Park is likely to remain '*Open Space Parkland*', and the Southport site to remain a nursing home, which may be developed into another community use sometime in the future.

4 SUMMARY OF SITE HISTORY

In 1871 the South Melbourne Gas Company was established and leased 2.43 ha of land on Pickles Street on the boundary of what are now, the suburbs of Albert Park and Port Melbourne. The construction of the Port Melbourne gas manufacturing plant was completed in 1873. Following completion, the South Melbourne Gas Company merged with Melbourne and Collingwood Gas Companies, forming the Metropolitan Gas Company.

A crown grant for the leased site was issued to the Metropolitan Gas Company in 1878, with an additional 1ha of land being purchased in the northern section (East of Pickles Street). The main manufacturing plant for Gasworks was developed in this area. The operation was expanded over the following years with establishment of the meter shop site (1885), No. 1 Holder site (1888) and laboratory and oil store (1913). Following a short period of closure during the depression, some sections of the plant never reopened. Gas manufacture, however continued up until 1971 with the Gas and Fuel Corporation of Victoria becoming the registered proprietor of all properties onsite in 1955.

The City of South Melbourne and Government of Victoria acquired the manufacturing plant in 1979, redeveloping it into Gasworks Park. Gas and Fuel Corporation of Victoria still operate a small depot in the northern corner of the former gasworks site (i.e. Alinta site), however this is not part of the area under investigation. Southport Community Nursing Home was constructed on city owned land to the north-east of the site in 1981.

Investigations into the contamination status of the site commenced around 1985 with EPA Victoria issuing a Clean Up notice to Gas and Fuel Corporation of Victoria in 1988. The Gas and Fuel Corporation commenced assessment and remediation across the site as required under the Clean up Notice, resulting in EPA Victoria declaring the site suitable for park use in 1992. A historic site review prepared in 2004 by Golder Associates, however recommends that CoPP conduct further assessment and management of the site due to potential risks associated with soil and groundwater contamination.

Further detail regarding site history please refer to Environmental Earth Sciences VIC, 2010, Report 210074 titled 'Sampling and analysis plan for the former South Melbourne Gasworks, Albert Park, Victoria'.

4.1 Identified chemicals of potential concern

Contaminants of potential concern are associated the numerous gas manufacturing process during the site historical use as a gas manufacturing plant. These include:

- polycyclic aromatic hydrocarbons (PAH) from tar, coke, ash and oil wastes;
- total petroleum hydrocarbons (TPH) from tar, oil wastes as well as oil storages;
- heavy metals [i.e. arsenic (As)] from concentration of coal minerals;
- cyanide, sulfates and sulphides from gas purification and waste water treatment;
- phenols from tar wastes;
- monocyclic aromatic hydrocarbons (MAHs) including but not limited to benzene, toluene, ethylbenzene and xylene compounds (BTEX);;
- polychlorinated biphenyls (PCBs) associated with the substations; and
- solvents associated with maintenance.

4.2 Previous investigations

4.2.1 Golder Associates

A total of eleven documents, detailing environmental works undertaken by Golder Associates at the site between 2004 and 2007, were provided for review as part of this groundwater investigation. The reports detail the site history, site conceptual model, soil and groundwater investigations undertaken and recommendations for further investigation and remediation.

From these works, Golder Associates concluded the site history indicated significant potential for contamination of soil and groundwater to have occurred from historical on-site gasworks processes and/or the storage/management of on-site waste. As little remediation of on-site soil was conducted, the potential for the soil to still be contaminated and acting as a source for groundwater impacts was high. Remediation was limited to excavation of 0.5 m of contaminated fill material and replacement with “clean soil” in the south-eastern corner of the site. Other remedial works have been limited to landscaping and the placing of topsoil and clay over the site.

The general stratigraphy within Gasworks Park was observed to comprise a layer of fill material overlying natural sands, clayey sands and sandy clays. Fill material varied between 0.5 m and 3.2 m and surface fill material generally comprised black sands with fragments of coke, bricks and glass.

Groundwater impacts include:

- contamination with common gasworks chemicals, including heavy metals, ammonia, total cyanide, sulfate, total dissolved solids (TDS), PAHs, TPHs and monocyclic aromatic hydrocarbons (MAHs);
- the main sources of ammonia, TDS and sulfate in the groundwater appears to be in the north eastern portion of the site, whilst the main PAH and MAH sources appear to be in the south eastern and north eastern portion of the site;
- groundwater to the west and north west of Gasworks Park is contaminated with some heavy metals [arsenic (As), cobalt (Co), copper (Cu), lead (Pb), nickel, (Ni), zinc (Zn), selenium (Se), boron (B) and manganese (Mn)], sodium (Na), sulfate (SO_4^{2-}), chloride (Cl), bicarbonate (HCO_3) and total CN. Concentrations are generally consistent across

the off-site wells to the east and north of Gasworks Park, potentially indicating background concentrations of the area;

- the main CoC found during the groundwater sampling was ammonia;
- levels of pH are indicative of background concentrations and are not considered to be as a result of contamination at the site; and
- there are a variety of potential sources of the groundwater contamination in the north-western portion of the Gasworks Park including Gasworks Park, the Alinta site, the former gasholder yard and laboratory site to the west of Pickles Street, and potentially other currently unidentified areas in the vicinity where gasworks fill which may have been placed as part of historical filling in the region.

The hydrogeological conceptual model indicates that discharge of groundwater from the Gasworks Park precinct is to the surrounding the sewer network, of which the point of discharge is thought to be the Werribee Treatment Plant. There were, however, three possible areas of off-site impact from groundwater beneath the Gasworks Park and Southport site which were identified as:

- the Alinta site;
- the area between the site and the South Yarra main and Hobsons Bay main (surrounding road reserves); and
- the residential area north of Richardson Street and north east of Southport Community Nursing Home between the site and the point of discharge into the South Yarra main.

For more detail of previous environmental investigations undertaken at the site, please refer to Environmental Earth Sciences VIC, 2010, Report number 210074 - *Sampling and Analysis Plan for the former South Melbourne Gasworks*, *Albert Park, Victoria* (Environmental Earth Sciences, 2010).

4.2.2 GHD

GHD undertook a preliminary assessment of the risks associated with groundwater and soil contamination at SMG as part of the 53V audit currently being undertaken by Dr. Peter Nadebaum. This objective and method of '*screening risk assessment*' was to formulate the auditor's opinion on the risk posed to the relevant beneficial uses. This report also documents what further investigation and remediation work may be require to complete the audit.

In each case, a particular scenario and level of effect was considered, and the likelihood of this scenario occurring was then determined based on the information obtained from the preliminary review of information pertaining to SMG and in consultation with stakeholders.

Findings of the screening risk assessment process, taking into account the relevant controls measure, are identified as the following:

- 50 medium risk scenarios;
- 99 low risk scenarios; and
- 115 negligible risk scenarios.

The auditor identified groundwater issues requiring further assessment to resolve uncertainty and to better understand the level of risk, which included:

- non-aqueous phase liquid (NAPL), particularly its presence and extent on-site, and its significance as an on-going source of vapour and groundwater contamination;
- the migration of dissolved phase groundwater contamination off-site, and the potential for use of this groundwater; and
- the extent to which deeper groundwater might be contaminated and result in groundwater contamination migrating from the site.

5 GEOLOGY AND HYDROGEOLOGY

This section provides an overview of the geology and hydrogeology summarised from previous reports, particularly the *Sampling and Analysis Plan* (Environmental Earth Sciences, 2010).

5.1 Geology

According to the Geological Survey of Victoria (GSV 1974) *Melbourne 1:63,360 map sheet*, the surface geology at the site is the Recent Holocene aged (0-10,000 year old [yo]) Port Melbourne Sand (PMS), consisting of raised beach ridges of well sorted sand, shelly sand, minor silty or clayey sand.

Regionally, the PMS formation in the region is sequentially underlain by the following formations:

- Pliocene age (late Tertiary era – 5.3 to 1.8 myo) Brighton Group sediments, consisting of red-brown, yellow and white cross-bedded sands and silty sands (with clay);
- Late Lower Tertiary Eocene aged (36-53 Myo), olivine and titanaugite dense blue-black Older Volcanics basalt (OVB);
- Eocene age (early Tertiary era – 54.8 to 33.7 myo) sand and silty-sands with clay, with pyritic and lignitic sands, of the Werribee Formation; and
- Late Upper Silurian aged (400 Myo) Dargile Formation sandstone and siltstone.

The geological units encountered during site investigation works included:

- PMS – the upper geological formation at the site, which discontinuously underlies the fill material, and has been identified in lenses up to 2.6 m thick in the southern portion of Gasworks Park;
- Brighton Group – encountered underlying fill material and, where present, the PMS. Brighton Group sediments have been identified extending to a maximum depth of 22 m BGL; and
- OVB – identified underlying Brighton Group sediments at approximately 18 m BGL in the north-eastern portion of the site.

5.1.1 Soil

The soils of the local area are described in van de Graaff (1996) - *Landcare Notes Melbourne Soils* as comprising dark loams, clays and local sands. These features are consistent with the local geology as described above, being PMS sands and silty/clayey

sands. Although the site is located in an area that potentially contains acid sulfate soil (ASS) (DPI, 2003) the only estuarine deposits where ASS are likely have been identified to the west of the site.

5.2 Hydrogeology

Interpretation of previous groundwater investigations and monitoring events indentified several potential aquifers and aquitards beneath the site. The Brighton Group is the shallowest aquifer on site. It is underlain by the OVB, which is considered to be an aquitard due to its high clay content. As such it hydraulically insulates but does not isolate the deeper geological units from the Brighton Group sediments.

Table 3 summarises registered groundwater wells within 3 km of the site from a recent well search. It is understood that there are 29 registered groundwater wells with variable yields existing within the OVB within a 3 km radius (limits of SKM groundwater well database search) of the site (although none of these are on the site). There have been no registered groundwater wells accessing the Dargile Formation within 3 km radius of the site. Most registered wells in the vicinity of the site are screened within the Quaternary and Tertiary sediments of the PMS and Brighton Group. Therefore, it is the utilisation of the watertable aquifer in Brighton Group Sediments which is of primary concern.

5.2.1 Groundwater flow

Regional groundwater flow in the basement Dargile Formation is towards Port Phillip Bay, therefore under natural hydraulic gradients, the groundwater flow direction would be expected to be towards the south to south west beneath the site. Previous groundwater assessments at the site (Golder Associates, 2006; 2006b; and 2006c) indicate that local groundwater flow in the shallow Brighton Group sediments is controlled by the sewer system(s) that is described previously in Section 3.2.1.

Groundwater within the Brighton Group sediments beneath Gasworks Park generally flows radially from the site towards the nearby sewers aligned along Foote Street, Graham Street and Pickles Street, which act as groundwater sinks. This is consistent with the deepest drawdown being observed at the corners of the site, which is supported by previous investigations by Golders Associates. Groundwater levels in the Brighton Group beneath Gasworks Park are all below sea level due to the drawdown caused by the sewers. Therefore, the vertical gradient between the OVB and the Brighton Group is upwards, potentially contributing inflow to the groundwater system beneath the site.

An upward hydraulic gradient would prevent the downward migration of any contaminants of potential concern (CoPC) from the water table aquifer in the Brighton Group. Golder Associates noted that *"given the laterally extensive nature of the observed length of groundwater depression, it appears that leakage into the South Yarra main sewer and Hobsons Bay main occurs regularly along the sewer length rather than in discrete zones. As a result, groundwater is unable to migrate across the depression but rather discharges to the sewer*" (Golder Associates, 2006e). Thus, the distribution of CoPCs is interpreted to be controlled and contained both vertically and horizontally by the sewer network around the site.

This local groundwater flow system is dependent on the leakage of groundwater into the sewers. If leakage to the sewers were reduced significantly, the flow regime would change.

5.2.2 Trade Waste Agreement

During the initial planning phase of the further groundwater investigation strategy with CoPP and the auditor, Environmental Earth Sciences VIC was informed of a '*Deed of Agreement Groundwater and Gasworks Arts Park, Albert Park*' executed between CoPP, Melbourne Water and South East Water on 4 January 2010.

This '*Deed of Agreement'* states that Melbourne Water (responsible for the South Yarra Sewer Main and Hobsons Bay Sewer Main) and South East Water (responsible for the Pickles Street Branch sewer) acknowledge that these sewers act as a control for groundwater surrounding Gasworks Arts Park and agree to accept groundwater discharging from Gasworks Arts Park. A copy of the *'Deed of Agreement'* is provided in Appendix E.

Under the Operative provisions *'City of Port Phillip obligations*', CoPP agreed that it will:

- prepare a monitoring plan and submit it to Melbourne Water and South East Water for approval;
- continue to monitor groundwater contamination at, and in the vicinity of, the South Yarra main, Hobsons Bay main and Pickles Street branch sewer in accordance with the monitoring Plan;
- supply data relating to groundwater recorded or obtained in the course of implementing the monitoring Plan to Melbourne water and South Easter water;
- notify Melbourne Water and South East Water of any groundwater changes in accordance with the monitoring plan; and
- have and implement a contingency plan to manage the contamination risks posed by groundwater to meet EPA requirements should Melbourne Water or South East Water undertake work to its sewer which increases risks associated with groundwater contamination from the site to an unacceptable level.

As part of the '*Deed of Agreement'*, Melbourne Water obligations include the following:

- it will accept groundwater from the Gasworks Site into the South Yarra Main and Hobsons Bay Main provided that it maintains the right, acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets or does not comply with trade waste requirements or safety requirements imposed by the Victorian Government from time to time;
- it will not unreasonable withhold its approval of the Monitoring Plan submitted by the Council;
- it will provide Council with eight weeks written notice before commencing any works to the South Yarra Main or Hobsons Bay Main, accompanied by a plan showing the particulars of the proposed works; and
- in the event that emergency works are required to the South Yarra Main or Hobsons Bay Main, it will provide Council with notification as soon as possible after the commencement of the works.

South East Water obligations include the following:

- it will accept groundwater that enters the Gasworks Site into Pickles Street Branch sewer provided that it maintains the right, acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets;
- it will not unreasonably withhold its approval of the monitoring Plan submitted by Council;

- it will provide Council with eight weeks written notice before commencing any works to the Pickles Street Branch Sewer, accompanied by a plan showing the particulars of the proposed works; and
- in the event that emergency works are required to the Pickles Street, it will provide Council with notification as soon as possible after the commencement of the works.

5.2.3 Regional groundwater utilisation

A registered well search of the Department of Sustainability and Environment (DSE) '*Groundwater Database'* (Sinclair Knights Merz, 2010) has indicated that 291 wells are located within a 3 km radius of the site. Drilling geological logs of registered wells located within the vicinity of the site appear to be within the same or similar geological units as at the site. Further useful information however, is limited.

Table 3 summarises the details of the information available for the groundwater wells located within 3 km of the site. Note that some wells did not contain any relevant information.

Groundwater wells with specific information include:

- well 78476 (located 870 m north-west of the site) was installed in 1990. Groundwater was encountered from 1.8 m BGL (below ground level).with the water bearing zone consisting of silty sands and sands with shells. It has an un-known registered use;
- well 78467 (located 1.75 km north-west of the site) was installed in 1986. Groundwater was encountered at 3.3 m BGL. The lithology encountered is marl; a lime-rich clay. The limited chemistry data available for this well indicates electrical conductivity during testing was 221 mg/L TDS. The well is registered for stock/domestic purposes;
- well 78462 (located 1.2 km south-east of site) was installed in 1983 to a total depth of 3 m BGL. Groundwater was encountered at 3 m BGL with a yield of 0.4 L/sec reported at the time of construction. The screen is situated in marl and sand; and
- well 78463 (location 1.9 km north-west of site) was installed in 1983 to a total depth of 5 m BGL. Groundwater was encountered at 1.8 m BGL with a yield of 0.4 L/sec reported at the time of construction. The screen is situated in marl and sand.

Overall, information for wells within 3 km of the site is relatively scarce, the aquifer is not widely used as a resource and that there are no registered wells in the immediate area of the Gasworks Park Precinct. Approximately 63% of the wells were installed for investigative rather than abstraction purposes, 24% were installed for unknown purposes with stock/domestic (12%) and irrigation (3%) accounting for the remaining wells.

There are more than 30 wells in Table 3 with listed uses as stock/domestic or irrigation, including more than 10 within 1 km of the site. Therefore, irrigation is one of the beneficial uses of the local groundwater.

The Department of Natural Resources and Environment (DNRE) South Eastern Victoria Regional Aquifer Systems (1995) defines groundwater in the Upper Tertiary Aquifer System in the vicinity of the site as 'Segment A_2', with a total dissolved solids (TDS) range of 501-1000 mg/L. Segment A_2 groundwater has the full range of protected beneficial uses, i.e. drinking water, potable mineral water, irrigation, stock water, industry, ecosystem protection and building and structures. These beneficial uses are described in more detail in Section 6 and 10.4.

5.2.4 Groundwater monitoring well network

The existing site monitoring well network prior to these works consisted of 35 groundwater monitoring wells identified as GW1 - GW36 as presented in Table 4 (note that monitoring well GW17 does not exist). An additional seven groundwater wells were installed as part of these works, identified as GW37-GW44, as discussed further in Section 8.1.

All groundwater wells are installed into the upper part of the Brighton Group, except wells GW42-GW44, which are deeper wells screened at the base of this unit (as denoted by the suffix D). The locations of the wells are shown in Figure 3. Groundwater wells are classified based on their spatial location into four groups, i.e.

- "OS" Wells: onsite groundwater wells, including all groundwater wells installed in Gasworks park and South Port Nursing home and also including wells GW01, GW05, GW31, GW35 and GW44, which are close to the site perimeter, down-gradient from the site and, therefore, considered to be potentially impacted by on-site contamination;
- "NW" Wells: offsite groundwater wells to the north (and north-west) of the site, i.e. GW06,GW32 to GW34 and GW36;
- "NE Wells": offsite groundwater wells to the east north-east of the site (in the residential area to the east of Richardson Street and to the north of Bridport Street, i.e. GW07, GW08, GW26 to GW30, GW37, GW38; and
- "SE Wells": offsite groundwater wells to the south east of the site (all wells to the east of Foote Street and Bridport Street), i.e. GW09 to GW16 and GW25.

6 ASSESSMENT CRITERIA

The SEPP *GoV* provides the framework for the protection of groundwater and associated beneficial uses throughout Victoria. The policy allows for a consistent approach for the prevention and clean-up of contamination to groundwater throughout Victoria and sets environmental quality indicators and objectives for each beneficial use. The SEPP *GoV* defines certain aquifer categories based on salinity reported as TDS and associated beneficial uses to be protected. The beneficial uses of groundwater to be protected are dependent on the proposed land-use and are shown in Table 1.

Beneficial uses pertaining to the site may not apply to groundwater when:

- there is insufficient groundwater yield;
- the background level of a water quality indicator/s other than TDS precludes a beneficial use;
- the soil characteristics preclude a beneficial use; and
- a Groundwater Quality Restricted Use Zone (GQRUZ) has been declared by the EPA.

Any assessment of the likelihood of beneficial uses of groundwater being realised should be based on an evaluation of whether an owner/occupier of the site (or in the vicinity of the site) may reasonably expect to use or be able to use groundwater for the relevant purposes.

Based on the TDS values considered to be background in the area of SMG the groundwater classifies as Segment A_2. The SEPP *GoV* states that in order to protect the beneficial uses associated with the 'Segment A_2' (relevant to this site) the following should be referred to:

- maintenance of ecosystems – criteria specified for protection of marine water ecosystems in ANZECC/ ARMCANZ 2000. For this site, the most sensitive beneficial use to be protected is Port Philip Bay, which is considered to be a marine water ecosystem slightly impacted by nearby human activities. As such, the 95% protection of species guideline for a 'slightly modified' marine water environment is considered the most suitable criteria for groundwater assessment at the site. Note that, under natural conditions, the groundwater flow direction would be towards Port Phillip Bay; hence the protection of marine environments would be relevant. However, due to the surrounding sewer system(s) controlling local groundwater flow in the Brighton Group sediments, groundwater from beneath the site is captured and none of the groundwater on site discharges to Port Phillip Bay. Therefore, protection of ecosystems would only be relevant if the sewers were sealed and, therefore, no longer controlled local groundwater flow;
- potable water supply (acceptable) – those specified for health in the National Health and Medical Research Council (NHMRC), 2004 and 2011, Australian Drinking Water Guidelines;
- potable mineral water supply – those specified for potable mineral water in the Australian Food Standards Code (1987) – Standard 08 Mineral Water;
- agriculture, parks and gardens – those specified in ANZECC 2000 for irrigation;
- stock watering – those specified for livestock in the ANZECC 2000 guidelines;
- Industrial Water Use – those specified for industrial use in the ANZECC 2000 guidelines;
- primary contact recreation – those specified for primary contact recreation in the NHMRC and ARMCANZ (2008) Australian drinking water guidelines. Consumption of water during recreational events (i.e. in creeks or swimming pools using groundwater) has been considered, with criteria for non-volatile contaminants being set at 20 times the health criteria based on the assumption that recreational swimmers consume 100 mL of water per session, while NHMRC (2008) drinking criteria assume 2 L/day potable water consumption (also reported in ANZECC 1992, p3-7); and
- buildings and structures – The SEPP GoV states that concentrations of pH, sulfate and redox potential should be considered but does not specify a reference. Therefore, the Australian Standard AS3600-2001 Concrete Structures is referred to.

For the purpose of this assessment all beneficial uses described above will be considered with the exception of the following:

- potable mineral water supply – this beneficial use is excluded as the groundwater does not display effervescent qualities as required under the definition of "potable mineral water" in the SEPP GoV and the area is not within a designated mineral water production zone.

The adopted investigation levels for groundwater are dictated by the potential beneficial uses of groundwater. These are primarily defined by the SEPP (1997) *GoV*. Where the SEPP *GoV* does not specify contaminant limits, the ANZECC/ ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* and NEPM (1999) *Groundwater investigation levels* (GILs) are consulted. In Victoria, the NEPM levels are generally used in preference to ANZECC/ ARMCANZ criteria for all beneficial uses other than ecological receptors.

The reason for this is that the ecological receptor for an aquifer is the nearest potential surface receiving water or discharge zone for that aquifer, which is controlled under the SEPP *Waters of Victoria* (WoV). The SEPP WoV refers to ANZECC/ ARMCANZ 2000.

In the absence of relevant Australian based criteria for various compounds, the Dutch Intervention Levels are often referenced. This is most commonly undertaken for total petroleum hydrocarbons (TPH) in water by use of the 600 µg/L mineral oil intervention level. If TPH compounds are detected, it is considered more important to focus on benzene, toluene, ethyl-benzene and xylene (BTEX) and polycyclic aromatic hydrocarbon (PAH) compound levels in determining potential human health and ecosystem risks.

The '*Deed of Agreement',* executed between CoPP, Melbourne Water and South East Water (Section 5.2.2), states that Melbourne Water and South East Water will accept groundwater discharging from Gasworks Arts Park to surrounding sewers provided that they:

"maintain the right acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets or does not comply with trade waste requirements or safety requirements imposed by the Victorian Government from time to time".

In reference to Melbourne Water and South East Water specific obligations, groundwater concentrations at the site have been compared against South East Water '*Standards for trade waste discharge to the sewerage system*', presented in Appendix G. Please note Melbourne Water standards for discharge could not be identified.

The following guidelines have also been used as guiding documents:

- EPA Victoria (2000) EPA Information Bulletin – Publication 669 Groundwater sampling guidelines; and
- Victoria Government Gazette (1997) Variation of the State environment protection policy (Waters of Victoria) – insertion of Schedule F6. Waters of Port Phillip Bay.

It is important to note that the LOR for selected analytes was noted (following analysis) to exceed selected criteria. These include:

- Se (LOR - 0.01 mg/L) is higher than the ecosystem criteria (0.003 mg/L);
- anthracene (LOR – 1 ug/L) is higher than the ecosystem criteria (0.4 ug/L); and
- BaP (LOR – 0.5 ug/L) is higher ecosystem criteria (0.2 ug/L), health criteria (0.01 ug/L) and recreation criteria (0.2 ug/L).

Environmental Earth Sciences will ensure that the LOR is reduced (to below criteria) during future rounds of monitoring (if required).

7 FIELD ASSESSMENT

Field work as part of this groundwater investigation (on- and offsite) included:

- a groundwater gauging round, including the recording of groundwater standing water levels (SWLs), assessment of the presence of NAPL and well serviceability checks;
- the installation of five shallow groundwater wells:
  - three wells were drilled onsite within the South Port Nursing Home (GW39) and Gasworks park along the boundary of the Alinta site (GW40 and GW41); and
  - two wells were drilled offsite to the north-east (GW37 and GW38);
- the installation of three deep groundwater wells:
  - two wells were drilled onsite, one located in the south-eastern corner (GW42D) and the north western corner (GW43D) of the site; and
  - one well was drilled offsite to the north east (GW44D).
- development of all onsite and offsite groundwater wells, including existing and newly installed wells;
- the collection of groundwater samples from thirty one (31) existing groundwater wells and eight recently installed wells for laboratory analysis of chemicals of concern (CoC), following adequate purging, stabilisation and recording of field parameters;
- the collection of groundwater levels from the groundwater wells and interpretation of the water table surface and groundwater flow directions; and
- evaluation of aquifer properties by slug testing (i.e. rising and falling head tests) selectively undertaken on six groundwater wells.

7.1 Groundwater well installation

Eight new groundwater wells were installed onsite and offsite between 28 February and 8 March 2011 by NUMAC Drilling Services (NUMAC) under the direct supervision of Environmental Earth Sciences VIC personnel.

The location of each well was selected to:

- further characterise and delineate groundwater pollution offsite to the east of the site (GW37 and GW38);
- investigate if Gasworks Park is a potential source of groundwater pollution offsite towards the Alinta Site (north) (GW40 and GW41);
- assess the potential for contamination of deeper groundwater on- and off-site due to onsite pollution (GW42D, GW43D and GW44D);
- further delineate the extent and source areas of contaminated groundwater (GW39 and GW42D); and
- assess the migration of CoC to down-gradient receptors (GW37 and GW38).

The location of each well is presented in Figure 3 and the rationale for each well location is described in Table 5. All well locations were approved by the site Environmental Auditor, Dr. Peter Nadebaum (GHD) prior to the commencement of field works.

7.1.1 Shallow Brighton Group wells

Shallow groundwater wells (GW37 to GW41) were constructed to monitor across the watertable. The shallow wells were installed to total depths ranging between 10.0 and 11.5 metres below ground level (mbgl) and constructed of Class 18 uPVC with diameter 50 mm and slotted screen (0.4 mm slot apertures and 4 mm slot spacing) placed across the saturated zone, in an augered borehole of diameter 125 mm. Each installation was completed with filter pack sand (16/30 grade) completely filling the annular space from the base of the borehole to a maximum of 1.0 m above the screen, a bentonite seal of thickness 0.5 m placed above the sand and cement grout (with 5% bentonite) placed within the remaining annulus to ground level.

Well construction details are presented in Table 6, with geological borelogs presented in Appendix A. Borelogs were logged in accordance with Environmental Earth Sciences, 2008 – *Company logging manual.*

7.1.2 Deep Brighton Group wells

Figures 4 and 5 illustrate the construction details of deeper groundwater wells GW42D, GW43D and GW44D. These deep Brighton Group wells were installed using telescopic construction techniques and mud rotary drilling techniques to prevent cross contamination between shallow and deep sediments, as follows:

- an initial borehole 300 mm in diameter was drilled through fill material to depths between 2.5 and 3.6 mbgl using a solid flight auger. This interval was sealed off using 250-mm internal diameter PVC casing to the base, cemented (quick set) to surface level and allowed to cure;
- a 190-mm diameter borehole was then drilled within the initial cased interval using mud rotary techniques. The borehole was extended into the upper Brighton Group to a depth of between 12.0 and 13.5 mbgl). The upper Brighton Group was then sealed off using 125 mm internal diameter PVC casing to the base, grouted (via tremie pipe) to surface level and allowed to cure; and
- a 125-mm diameter borehole was then drilled through the base of the 125-mm cased borehole using mud rotary techniques. The borehole was extended through the Brighton Group to the OVB, at approximately 17.0 mbgl. The wells were completed using 50 mm internal diameter PCV to total depths between 17.0 and 17.8 mbgl with a 3 m slotted screen (0.4 mm slot apertures and 4 mm slot spacing) positioned at the base of the Brighton Group. Each installation was completed with filter pack sand (16/30) placed up to 0.5 m above the screen, 0.5 m bentonite seal placed above the sand and cement grout (5% bentonite) filling the remaining annulus to ground level.

Well construction details are presented in Table 6 and Figures 4 and 5, with geological borelogs presented in Appendix A. Borelogs were logged in accordance with Environmental Earth Sciences, 2008 – *Company logging manual.*

Drilling mud produced during well installation was stored onsite in sealed, appropriately labelled steel drums.

7.1.3 Well development

All existing and newly installed groundwater wells were developed to optimise their hydraulic connection to the aquifer and remove drilling residues.

Development of the three deep wells (GW42D, GW43D and GW44D) was undertaken by air lifting on 9 March 2011. Groundwater extracted during airlifting was directed through a T-piece PVC pipe and collected in 200 L storage drums and awaiting offsite disposed to a facility licensed to accept such waste.

Newly installed shallow wells (GW37 to GW41) were developed between 21 and 22 March 2011 by a combination of pumping, bailing and surging in reference to EPA Publication 669, 2000 – *Groundwater sampling guidelines.* Additionally, all existing groundwater wells (GW1 to GW36) were re-developed to remove sediment and optimise aquifer connectivity.

Wells GW8, GW18, GW19, GW20, GW21, GW22, GW23 and GW24 could not be located during the initial development program. These wells were later located using a surveyor on 13 April 2011 and were re-developed (along with the three deep groundwater wells (GW42D to GW44D), by pumping, bailing and surging and were allowed to equilibrate prior to groundwater sampling.

Details of the groundwater well development program, including purged volumes and field observations, are presented in Table 7.

7.2 Groundwater sampling methodology

Groundwater sampling at each existing and newly installed groundwater well was undertaken between 18 and 21 April 2011, with the exception of GW7 which was sampled on 2 May 2011. Prior to purging, a multi-phase dipper was used to measure the SWL in each well and to assess the presence of LNAPL or DNAPL, if any.

Sampling was undertaken via low flow (Micro-purge) sampling techniques, with the pump inlet placed at depths within the screen interval. Purging was continued until field parameters [pH, electrolytic conductivity (EC), oxidation/reduction potential (ORP or pe), dissolved oxygen (DO), temperature and flow rate (yield)] had stabilised (refer to Table 8) and a sustainable sampling flow rate (i.e. minimal draw down) had been established to confirm that a representative sample of the aquifer was collected. Groundwater sampling records have been provided in Appendix I.

Groundwater well GW4 displayed insufficient yield to sustain an adequate flow rate with minimal drawdown. As such, purging and collection of field parameters was continued using a hand bailer until the well was purged dry and it was sampled following adequate recharge.

Groundwater samples were collected in amber glass bottles, volatile vials or plastic bottles depending on the individual analytes and required preservatives, labelled with the groundwater well number, site reference and date before being placed in a cooler with ice. All sampling procedures were undertaken in accordance with Environmental Earth Sciences, 2009, *Soil, gas & groundwater sampling manual* and EPA Publication 669, 2000, *Groundwater sampling guidelines*. Practices to eliminate cross contamination included the following:

- use of individual dedicated pump bladders and tubing at each groundwater well; and
- thorough washing of all re-used sampling equipment (i.e. pump and steel cable) with detergent (Decon 90) water, then double rinsing with clean water and drying before the collection of each sample.

Samples analysed for metals concentrations were collected without filtering in the field and without preservative. These samples were filtered by the laboratory before analysis. Further discussion on this procedure, and the results obtained, is provided in Section 10.3.

7.3 Groundwater field physical assessment

Following sample collection, slug tests (falling and rising head) were undertaken in selected wells utilising transducers. The slug tests were undertaken to confirm the hydraulic conductivity data (of the shallow water bearing zones) derived from previous assessments and evaluate the hydraulic conductivity of the deeper water bearing zones within the Brighton Group sediments.

Slug tests were undertaken on shallow wells GW7, GW37, GW30 and GW40 and deeper wells GW42 and GW44, as follows:

- install pressure transducer at the base of the well;
- measurement and recording of SWL;
- full immersion of a solid slug of approximate volume 1 litre to initiate falling head test;
- measurement of the recovery of groundwater level (falling head test);
- removal of the slug to initiate rising head test;
- measurement of the recovery of groundwater level (rising head test);
- assessment of data quality, preparation of tables and graphs of displacement vs. time for analysis;
- estimation of hydraulic conductivity (K) values for falling and rising head tests using the Cooper-Bredehoeft Papadopulos (CBP) method and Bower-Rice method; and
- estimation of the mean K value across the site.

Aquifer property estimates from the slug tests are discussed further in Section 10.1 and presented in Table 10 and Appendix B.

Groundwater levels were measured in April 2011. The groundwater elevations are presented in Table 9 and the interpreted water table surface is presented in Figure 6.

8 LABORATORY ANALYSIS

The schedule for laboratory analysis of groundwater samples was based on findings from historical investigations. All groundwater analysis was undertaken by Australian Laboratory Services (ALS) and SGS Australia, both NATA accredited. Laboratory transcripts for groundwater samples are presented in Appendix C.

8.1 Laboratory analysis

Groundwater was collected for organic and inorganic analysis from thirty nine groundwater wells during the April 2011 groundwater sampling event. Each groundwater sample was analysed for the following analytical schedule:

- ionic balance including pH, TDS, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, NH_4^{+}, Cl^{-}, HCO_3^{-}, SO_4^{2-}, NO_3^{-}, NO_2^{-}, PO_4^{3-} and F^{-};

- dissolved heavy metals including Al, As, B, Cd, Co, Cr (VI), Cu, Fe, Hg, Pb, Mn, Ni, Se and Zn;
- total, free and weak acid dissociable (WAD) cyanide;
- TPHs and total recoverable hydrocarbons (TRH);
- monocyclic aromatic hydrocarbons (MAHs) including BTEX;
- PAHs; and
- volatile organic compounds (VOCs).

Seven intra- and one inter- laboratory duplicate samples were collected during sampling and selectively analysed for a range of CoPC for quality control purposes. Please note that four intra- and four inter-laboratory duplicates were collected during fieldwork, however confusion during sample laboratory sorting resulted seven intra-laboratory and one inter-laboratory samples being analysed. The implications of not having the correct number of inter-laboratory duplicates analysed are discussed in Appendix D.

The results of organic and inorganic laboratory analysis are discussed in Section 10, and complete laboratory transcripts are presented in Appendix C.

8.2 Procedures for quality assurance and quality control

Quality control (QC) is achieved by using NATA registered laboratories using ASTM standard methods supported by internal duplicates, the checking of high, abnormal or otherwise anomalous results, against background and other chemical results for the sample concerned.

Quality assurance (QA) is achieved by confirming field or anticipated results based upon the comparison of field observations with laboratory results. In addition, the laboratory undertakes additional duplicate analysis as part of their internal QA program on the basis of one duplicate for every 20 analysed.

Field observations are compared with laboratory results when they are not as expected and confirmation, re-sampling and re-analysis are undertaken if results cannot be correlated. In brief, correlations of field-measured pH with laboratory measurements were reliable with an average recorded relative percentage difference (RPD) of 2.9%. The laboratory-determined total dissolved salts (TDS) to field electrolytic conductivity (EC in µS/cm) relationship was, on average, 0.7, which provides confidence in the results obtained.

The potential for cross contamination of samples is considered to be negligible due to sampling decontamination and transportation procedures. This was confirmed after the analysis of rinsate and trip samples collected during each round of sampling reported concentrations of CoPC below the laboratory LOR. Full laboratory transcripts and chain of custody forms are presented in Appendix C, while further discussion on QA/QC is provided in Appendix D.

9 GROUNDWATER CHEMISTRY RESULTS

9.1 Organic groundwater analysis

For ease of interpretation, all organic laboratory groundwater results are presented in Tables 15-18. In addition, Appendix H presents figures illustrating concentrations of PAHs, BTEX and TPH. Only detectable organic results have been provided, with all other concentrations being less than the laboratory LOR.

Organic compounds which exceeded adopted site criteria include:

- PAH compound concentrations as follows:
  - naphthalene for OS wells GW24 (1,820 µg/L) and GW44D (142 µg/L);
  - phenanthrene concentrations ranging between 3.4 and 6.2 µg/L in OS wells GW3, GW4 and GW41;
  - anthracene concentrations ranging between 1.1 and 2.1 µg/L in OS wells GW3, GW4 and GW41;
  - fluoroanthene concentrations ranging between 2.1 and 8.4 µg/L for OS wells GW3, GW4, GW40, GW41 and GW43D; and
  - benzo(a)pyrene concentrations ranging between 0.9 and <53.8 µg/L for OS wells GW4, GW24, GW40, GW41 and GW44D.
- styrene concentration of 193 µg/L in OS well GW24.
- benzene concentrations ranging between:
  - 2 – 6,350 µg/L for OS wells GW3, GW23, GW24, GW39, GW42D and GW44D;
  - 5 µg/L for NW wells GW32; and
  - 13 – 42 µg/L for NE wells GW8, GW37 and GW38.
- toluene concentrations for OS wells GW24 (318 µg/L) and GW44D (712 µg/L);
- ethylbenzene concentrations for OS wells GW24 (111 µg/L), GW23 (13 µg/L) and GW44D (46 µg/L);
- xylene(s) concentration for OS wells GW24 (2,290 µg/L) and GW44D (435 µg/L);
- TPH Fraction C_6-C_9 concentrations for OS wells GW24 (9,780 µg/L), GW42D (470 µg/L) and GW44D (3,380 µg/L); and
- TPH fraction C_{10}-C_{36} concentrations for:
  - OS wells GW3 (2,010 µg/L), GW4 (1,080 µg/L), GW19 (1,250 µg/L), GW23 (1,800 µg/L), GW24 (20,500 µg/L), GW39 (2,170 µg/L), GW42D (4,720 µg/L) and GW44D (285,000 µg/L);
  - NE wells GW8, (1,710 µg/L), GW37 (2,000 µg/L) and GW38 (5,350 µg/L); and
  - SE wells GW11 (770 µg/L).

Silica gel clean up and re-analysis was undertaken on a number of samples for TPH fraction C_{10}-C_{36}. The results of this analysis indicated that approximately 37.6% to 100% of previously identified TPH compounds across the analysed samples were confirmed to be from primarily natural organic influences such as humic and fluvic acids rather than attributed

to true petroleum hydrocarbons. Therefore after silica gel clean-up only the following wells exceeded adopted ecological and health criteria (600 µg/L):

- OS wells GW24 (12,850 µg/L) and GW44D (57,800 µg/L); and
- NE well GW38 (1,300 µg/L).

TPH speciation analysis undertaken on samples GW24, GW38 and GW44D indicates the presence of aromatic hydrocarbons only, which is consistent the PAH and BTEX concentrations reported for these samples. This indicates that TPH detected onsite consists predominantly of BTEX and PAHs compounds. Therefore TPHs as a CoPC are of lesser concern on this site as they are assessed separately under their more toxic constituents.

Sample GW23 reported TPH concentrations in excess of adopted criteria, however was not submitted for silica gel clean-up. It considered likely that TPH concentrations in GW23 are the result of natural organic influences such as humic and fluvic acids rather than attributed to true petroleum hydrocarbons. This is based on the location of GW23, the low BTEX and PAH concentrations and the silica gel clean-up results from other samples.

9.2 Inorganic groundwater analysis

Inorganic laboratory groundwater results are presented in Tables 11-14. In addition, Appendix H presents figures illustrating concentrations of As, Co/Cu and Ni/Zn.

The mean pH measured in the four groups of wells were 6.34 in the SE wells, 6.62 in the OS wells, 7.01 in the NE wells and 7.30 in the NW wells.

The following water quality indicators exceed adopted criteria:

- pH levels indicated groundwater was too acidic in:
  - four OS wells GW19, GW21, GW22 and GW42D for health criteria (pH 6.5-8.5), with wells GW19 (pH 5.43) and GW21 (pH 5.44) also unacceptable for trade waste (pH 6.0-10.0);
  - NE well GW8 (pH 6.27) for health criteria; and
  - five SE (background) wells (GW10, GW11, GW13, GW15 and GW25) which recorded pH concentrations ranging between 5.23-6.45, unacceptable for health criteria, with wells GW10 (pH 5.23) and GW11 (pH 5.55) also unacceptable for trade waste.
- TDS concentrations exceeded:
  - irrigation criteria (500 mg/L) in all wells with exception to SE wells GW11, GW13, GW14, GW15, GW16 and GW25;
  - health criteria (1,000 mg/L) in all OS wells, with exception to GW22, and all NW and NE wells. No SE wells contained TDS concentrations which exceeded health criteria; and
  - livestock watering guideline (3,000 mg/L) in six OS wells (GW03, GW24, GW35, GW39, GW42D, GW43D and GW44D), three NW wells (GW33, GW34and GW36) and three NE wells (GW27, GW30 and GW38).
- Na^+ concentrations exceeded irrigation criteria (120 mg/L) in:
  - OS wells GW1, GW4, GW31, GW35, GW42D, GW43D and GW44D;
  - NW wells GW6, GW33, GW34 and GW36;

  - NE wells GW7, GW8, GW26, GW27, GW28, GW29, GW30 and GW38; and
  - SE wells GW9, GW10, GW12 and GW25.
- Cl^- concentrations exceeded:
  - health criteria (250 mg/L) in eight OS wells (GW1, GW31, GW35, GW40, GW41, GW42D, GW43D and GW44D), three NW wells (GW6, GW33and GW36) and six NE wells (GW8, GW26, GW27, GW28, GW29 and GW30); and
  - irrigation criteria (700 mg/L) in four OS wells (GW1, GW35, GW42D and GW43D), two NW wells (GW33and GW36) and three NE wells (GW27, GW29 and GW30).
- Mg concentrations exceeded livestock watering criteria (600 mg/L) in OS deep wells GW42D (787 mg/L) and GW43D (694 mg/L); and
- F concentrations exceeded:
  - irrigation criteria (1 mg/L) in OS wells GW1, GW3, GW3, GW31, GW35 and GW41, NW wells GW6, GW32, GW33 and GW36, and NE wells GW7, GW28, GW30 and GW37;
  - health criteria (1.5 mg/L) in OS well GW31, NW wells GW32, GW35 and GW36, and NE well GW30;
  - livestock criteria (2 mg/L) in OS well GW31 and NW well GW32.

The following inorganic CoPC and nutrients exceed adopted criteria:

- SO_4^{2-} concentrations in:
  - eight OS wells (GW3, GW19, GW21, GW24, GW39, GW42D, GW43D and GW44D) exceeded health criteria (500 mg/L), one OS well (GW42D) exceeded recreation criteria (10,000 mg/L), six OS wells (GW3, GW24, GW39, GW42D, GW43D and GW44D) exceeded livestock criteria (1,000 mg/L)and all OS wells with exception to GW40 exceeded trade waste criteria (100 mg/L). Concentrations of SO_4^{2-} in OS wells ranged between 28 and 14,800 mg/L;
  - three NW wells (GW33, GW34 and GW35) exceeded health criteria, two NW wells (GW33 and GW34) exceeded livestock criteria and all NW wells with exception to GW6 exceeded trade waste criteria. Concentrations of SO_4^{2-} in NW wells ranged between 72 and 1,930 mg/L;
  - five NE wells (GW8, GW27, GW30, GW37 and GW38) exceeded health criteria, two NE wells (GW8 and GW37) exceeded livestock criteria and all NE wells exceeded trade waste criteria. Concentrations of SO_4^{2-} in NE wells ranged between 167 and 1,510 mg/L; and
  - six SE wells (GW10, GW12 to GW15 and GW25) exceeded trade waste criteria. Concentrations of SO_4^{2-} in SE wells ranged between 46 and 303 mg/L.
- nitrate concentrations in OS well GW4 (69.6 mg/L), NE well GW29 (62.9 mg/L) and SE well GW9 (93 mg/L) exceeded the health criteria (50 mg/L);
- total CN concentrations in:
  - all OS wells with exception to GW43D exceeded ecosystem criteria (0.004 mg/L), eight OS wells exceeded health criteria (0.08 mg/L) and one OS well exceeded recreation criteria (1.6 mg/L). Concentrations of total CN in OS wells ranged between <0.004 and 3.98 mg/L;

  - all NW wells exceeded ecosystem criteria, and two NW wells (GW32 and GW34) exceeded health criteria. Concentrations of total CN in NW wells ranged between 0.006 and 0.24 mg/L;
  - all NE wells with exception to GW27, GW29 and GW30 exceeded ecosystem criteria and GW37 exceeded health criteria. Concentrations of total CN in NE wells ranged between <0.004 and 0.39 mg/L; and
  - five SE wells (GW11, GW13, GW14, GW15 and GW25) exceeded ecosystem criteria. Concentrations of total CN in SE wells ranged from <0.004 and 0.014 mg/L.
- NH_3 concentrations in:
  - all OS wells with exception to GW4 and GW41 exceed ecosystem criteria (0.91 mg/L), health criteria (0.5 mg/L - aesthetic consideration only) and recreation criteria, excluding GW22 (1.5 mg/L). Six OS wells (GW3, GW23, GW24, GW39, GW42D and GW44D) also exceeded trade waste criteria (200 mg/L). Concentration of NH4+ in OS wells ranged between 0.29 and 2,170 mg/L;
  - four NW wells (GW32, GW33, GW35 and GW36) exceeded ecosystem, health and recreation criteria. Concentrations of NH4+ in NW wells ranged between 0.41 and 12.5 mg/L;
  - six NE wells (GW7, GW8, GW26, GW28, GW37 and GW38) exceeded ecosystem criteria, seven NE wells (GW7, GW8, GW26, GW27, GW28, GW37 and GW38) exceeded health criteria, five NE wells (GW7, GW8, GW28, GW37 and GW38) exceeded recreation criteria and three NE wells (GW8, GW37 and GW38) exceeded trade waste criteria. Concentrations of NH4+ in NW wells ranged from 0.10 and 511 mg/L; and
  - three SE wells (GW9, GW14 and GW25 exceeded health criteria and GW25 also exceeded ecosystem criteria. Concentrations of NH4+ in SE wells ranged from <0.01 and 2.11 mg/L.

The following heavy metals CoPC exceed adopted criteria:

- Al concentration in OS well GW42D (3.91 mg/L) exceeded health (aesthetics) criteria (0.2 mg/L);
- As concentrations in:
  - all OS wells with exception to GW43D exceeded ecosystem criteria (0.0023 mg/L), all OS wells with exception to GW40 and GW43D exceeded health based criteria (0.007 mg/L), three OS wells (GW19, GW21 and GW31) exceed recreation criteria (0.14 mg/L), one OS well exceeds livestock criteria (0.5 mg/L) and three OS wells exceeded irrigation criteria (0.1 mg/L). Concentrations of As onsite ranges between 0.002 and 0.799 mg/L;
  - all NW wells with exception to GW6 exceeded ecosystem and health criteria and three wells (GW32, GW34 and GW35) exceeded recreation criteria. Concentrations of As in the NW wells ranges between 0.002 and 0.396 mg/L;
  - all NE wells with exception to GW29 exceeded ecosystem criteria, all NE wells with exception to GW29 and GW27 exceeded health criteria, GW28 exceeded recreation and irrigation criteria. Concentrations of As in NE wells ranges between 0.002 and 0.189 mg/L; and
  - five SE wells (GW9, GW10, GW12, GW13 and GW14) exceeded ecosystem criteria and GW12 exceeded health criteria. Concentrations of As in SE wells ranged between <0.001 and 0.008 mg/L.

- B concentrations in all OS wells (with exception to GW4, GW24 and GW40), all NW wells, all NE wells (with exception to GW26, GW29 and GW30) and SE wells GW13-GW16 and GW25 exceeded irrigation criteria (0.5 mg/L). The concentration of B in GW34 (NW well) was 6.88 mg/L, exceeding health criteria (4 mg/L), livestock criteria (5 mg/L) and irrigation criteria (0.5 mg/L);
- Cd in OS well GW43D (0.0025 mg/L) exceeded health criteria (0.02 mg/L);
- Co concentrations in:
    - ten OS wells (GW1, GW3, GW19, GW21, GW22, GW23, GW39, GHW42D, GW43D and GW44D) exceeded ecosystem criteria (0.001 mg/L) with three of these wells (GW42D, GW43D and GW44D) also exceeding irrigation criteria (0.05 mg/L). GW42D also exceeded livestock criteria (1.0 mg/L) with a concentration of 9.66 mg/L. Concentrations of Co in OS wells ranged between <0.001 and 9.66 mg/L;
    - four NW wells (GW33 to GW36) exceeded ecosystem criteria. Concentrations of Co in NW wells ranged between <0.001 and 0.005 mg/L;
    - seven NE wells (GW8, GW26, GW27, GW29, GW30, GW37 and GW38) exceeded ecosystem criteria. Concentrations of Co in NE wells ranged between <0.001 and 0.016 mg/L; and
    - two SE wells (GW14 and GW15) exceeded ecosystem criteria. Concentrations of Co in SE wells ranged between <0.001 and 0.008 mg/L.
- Cu concentrations in:
    - nine OS wells (GW1, GW4, GW21, GW22, GW24, GW31, GW42D, GW43D and GW44D) exceeded ecosystem criteria (0.013 mg/L). Concentrations of Cu in OS wells ranged between <0.001 and 0.051 mg/L;
    - all NW wells exceeded ecosystem criteria with concentrations ranging between 0.002 and 0.006 mg/L;
    - all NE wells with exception to GW7 and GW26 exceeded ecosystem criteria. Concentrations of Cu in NE wells ranged between <0.001 and 0.005 mg/L;
    - all SE wells with exception to GW9, GW14 and GW16 exceeded ecosystem criteria. Concentrations of Cu in SE wells ranged between <0.001 and 0.007 mg/L.
- Fe concentrations in:
    - ten onsite wells (GW01, GW03, GW04, GW19, GW21, GW23, GW39, GW42D, GW43D and GW44D) exceeded irrigation criteria (0.2 mg/L), with one well (GW19) also exceeding trade waste criteria (100 mg/L). Fe concentrations in OS wells ranged between <0.05 and 309 mg/L; and
    - two NE wells (GW8 and GE37) exceeded irrigation criteria. Concentrations within NE wells ranged between <0.05 and 3.5 mg/L.
- Pb concentrations in:
    - two OS wells (GW21 and GW22) exceeded ecosystem criteria (0.0044 mg/L). Concentrations of Pb in OS wells ranged between <0.001 and 0.01 mg/L;
    - one NE well (GW30) exceeded ecosystem criteria. Concentrations of Pb in NE wells ranged between <0.001 and 0.01 mg/L; and
    - one SE well (GW13) exceeded ecosystem criteria. Concentrations of Pb in SE wells ranged between <0.001 and 0.008 mg/L.

- Mn concentrations in:
  - seven OS wells (GW3, GW19, GW21, GW39, GW42D, GW43D and GW44D) exceeded health criteria (0.5 mg/L), with GW19, GW42D and GW44D also exceeding trade waste and recreation criteria (10 mg/L). Concentrations of Mn ranged between 0.01 and 14.2 mg/L except for GW42D with an outlier concentration of 120 mg/L, which exceeds health, recreation and trade waste criteria;
  - one NW well (GW35) exceeded health criteria with a concentration of 0.792 mg/L; and
  - three NE wells (GW08, GW26 and GW38) also exceeded health criteria. Concentrations of Mn within the NE wells ranged between 0.138 and 1.97 mg/L.
- Ni concentrations in:
  - six OS wells (GW19, GW22, GW23, GW39, GW42D, GW43D and GW44D) exceeded health criteria (0.02 mg/L), GW42D and GW44D also exceeded ecosystem criteria (0.07 mg/L). GW42D also exceeded recreational criteria (0.4 mg/L), livestock criteria (1 mg/L) and irrigation criteria (0.2 mg/L) with a concentration of 2.82 mg/L;
  - one NE well (GW38) exceeded ecosystem criteria, three NE wells (GW8, GW27 and GW38) exceeded health criteria and GW38 exceeded irrigation criteria. Concentrations of Ni within the NE wells ranged between 0.005 and 0.283 mg/L;
  - one SE well (GW10) exceeded health criteria with a concentration of 0.037 mg/L.
- Se concentrations in OS well GW42D (0.03 mg/L) exceeded ecosystem, health, livestock and irrigation;
- Zn concentrations in:
  - nine OS wells (GW1, GW3, GW19, GW21, GW22, GW31, GW42D, GW43D and GW44D) exceeded ecosystem criteria (0.015 mg/L); concentrations ranging between <0.005 and 0.129 mg/L except for GW42D with an outlier concentration of 2.2 mg/L which also exceeds irrigation criteria (2.0 mg/L);
  - five NE wells (GW7, GW8, GW27, GW29 and GW30) exceeded ecosystem criteria with concentrations ranging between <0.005 and 0.052 mg/L;
  - four SE wells (GW10, GW13, GW15 and GW16) exceeded ecosystem criteria with concentrations ranging between <0.005 and 0.045 mg/L.

10 DISCUSSION AND INTERPRETATION OF NEW DATA

10.1 Physical hydrogeology

Wells GW37 to GW44D were installed in sands and clays of the Brighton Group. Groundwater within this formation was generally first encountered at depths ranging between 7.5 and 8.0 mBGL. The depths of the new wells are described in Section 7. Five of the new wells were screened across the water table, but GW42D, 43D and 44D were installed at the base of the Brighton Group, approximately 6-10 m below the water table.

Following installation, each new groundwater well was surveyed at the top of casing and ground level relative to the Australian Height Datum (AHD) level by a qualified surveyor. Surveyed well levels and static water level (SWL) measurements undertaken in April 2011 are presented in Table 9. Hydraulic heads from the shallow wells were used to generate the watertable surface shown in Figure 6. The contours were generated by hand, with consideration of the sewer alignments, rather than using contouring software.

Hydraulic heads from both the shallow wells and deep wells GW42D, GW43D and GW44D are shown in cross section in Figures10 and 11. Due to their relatively high salinity, hydraulic heads in GW42D, GW43D and GW44D shown in Figures 10 and 11 were first corrected to equivalent freshwater heads, as described in the footer of Table 9. These corrections were minor and did not alter the interpreted direction of the vertical gradients at these locations. Figure 11 shows that small upward hydraulic gradients were observed at GW42D and GW43D. In contrast, a downward gradient was observed at GW44D, close to the eastern corner of the site.

The different vertical gradients at different locations are not considered to be significant. They could be caused by different rates of recharge at the water table in both location across the site and with time (due to short-term variations in climate). Localised vertical gradients could also be due to heterogeneities within the Brighton Group.

Figure 6 shows that, consistent with previous data, all hydraulic heads on site are significantly below 0 m AHD. A watertable that is significantly below 0 m AHD throughout the site would not be possible without an anthropogenic control over the groundwater flow. The drawdown of the watertable to levels that are several metres below sea level is caused by the sewers located along Bridport Street, Graham Street and Pickles Street. Figures 10 and 11 show the site hydrogeology and the sewers in cross section; the lines of section are shown in Figure 6. Groundwater beneath the site flows towards groundwater depressions associated with the sewers located along Foote Street, Graham Street and Pickles Street.

The horizontal hydraulic gradient over much of the site is in the range 0.006 to 0.01. However, it steepens to greater than 0.01 towards the sewers on Bridport Street, Graham Street and Pickles Street.

The consistent drawdown associated with and gradient towards the South Yarra Main Sewer, Hobson's Bay Main Sewer and, to a lesser extent, Pickles Street sewer, indicate that groundwater leakage into the sewers is continuous along the sewer length rather than in discrete zones. This is consistent with previous findings (Golder Associates, 2006a). Due to the significant permanent drawdown caused by these three sewers to several metres below natural groundwater levels, all groundwater from the site discharges to these sewers, with no migration across the sewers.

There is a sewer aligned along Richardson Street at an elevation of approximately -3.5 mAHD which is the north east boundary of the site. Figure 10 shows that the water table is more than 1 m below an elevation of -3.5 mAHD, along the length of Richardson Street, due to the drawdown caused by the other, deeper sewers. Therefore, if this sewer leaks it can be expected to have outward flow into the groundwater rather than inward flow from the groundwater.

Groundwater levels are relatively high within the north central portion of the site, with a groundwater divide located approximately along the site boundary between Gasworks Park and the Alinta site.

Figure 13 illustrates the conceptual groundwater flow system within the sediments of the Brighton Group without the vertical exaggeration used in Figures 10 and 11. This figure is intended to show the interpreted flow system in cross section from a location in the north-central part of the site to the site perimeter either on Foote Street or Graham Street. (Figure 6 shows that flow from the north-central part of the site is radial towards both Foote Street and Graham Street.)

Figure 13 shows that, in reality, the saturated thickness of the Brighton Group is small in comparison to the length of the horizontal flow path and that flow in the saturated zone is expected to be predominantly horizontal. As the sewers are within a few metres of the base of the Brighton Group, and the saturated thickness is generally 10 metres or less throughout the site area, lateral groundwater flow towards the sewers takes place through the full saturated thickness of the formation. From the flow paths shown in Figure 13, the groundwater near the base of the Brighton Group and near the discharge end of the flowpath (i.e. near the sewer) is likely to be the oldest groundwater in the flow system.

Based on the slug test analyses (Table 10), the median hydraulic conductivity in the shallow Brighton Group wells GW7, GW37, GW30 and GW40 was approximately 0.5 m/day and the median hydraulic conductivity evaluated from deeper wells GW42 and GW44 was significantly lower, at approximately 0.1 m/day. The mean hydraulic conductivity of the Brighton Group was estimated to be 0.3 m/day and the maximum hydraulic conductivity evaluated from the slug tests was 1.7 m/day.
The aquifer is considered to be heterogeneous in both the vertical and lateral directions due to lithological variations within the Brighton Group. Groundwater is likely to move preferentially through the most permeable layers. The maximum linear velocity of the groundwater is estimated to be approximately 30 m/yr, based on the maximum hydraulic conductivity of 1.7 m/day evaluated from slug tests, an effective porosity of 0.2 and a hydraulic gradient of 0.01. For the median hydraulic conductivity of 0.3 m/day calculated from the slug test results, the average linear velocity of the groundwater is estimated to be approximately 5 m/yr.

If the decrease in hydraulic conductivity with depth noted in the slug tests is representative of conditions across the site, it can be expected that groundwater flow through the basal Brighton Group close to the OVB would be slower than groundwater flow through the Brighton Group close to the water table.

10.2 Estimated groundwater flux to sewers

The flux of groundwater to the South Yarra Main Sewer, Hobsons Bay Main Sewer and Pickles Street sewers has been estimated from observations of hydraulic heads and estimates of Brighton Group aquifer properties using the formula Q=KiA.

South Yarra main sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 170 m, a hydraulic gradient of 0.02 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the South Yarra main sewer (along Bridport Street) was estimated to be 9 m^3/day (3 ML/yr).

Hobsons Bay main sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 140 m, a hydraulic gradient of 0.0035 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the Hobson Bay main sewer (along Graham Street) was estimated to be 1.3 m^3/day (0.5 ML/yr).

Pickles Street sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 112 m, a hydraulic gradient of 0.003 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the Pickles Street sewer was estimated to be 0.9 m^3/day (0.3 ML/yr).

Thus, the total discharge to the surrounding sewers from Gasworks Park and Southport Community Nursing Home is estimated to be 11 m^3/day, (4 ML/yr). This is approximately 5 times the rate previously estimated by Golder Associates (Golder Associates, 2006a). A rate of 11 m^3/day would be equivalent to a vertical recharge flux of approximately 100 mm/yr over the area of the Gasworks site. It is possible that a small proportion of the groundwater discharging from the site to the sewers originated as upward flow from the Older Volcanics. Therefore, the recharge rate on site may be slightly less than 100 mm/yr.

The flux estimates herein were calculated from observations of hydraulic properties and gradients within the Brighton Group sediments on site. Previous estimates by Golder were based on assumed sewer pipe hydraulic properties rather than on-site field measurements of Brighton Group properties. Although the new estimate of the total flux to the sewer system is greater than the previous estimate by Golder Associates, the calculated flux is orders of magnitude lower than the typical daily flow rate in the sewer.

10.3 Hydrogeochemistry

Results of the inorganic analysis of groundwater are presented in Tables 11-14. Several inorganic parameters were identified to be in excess of applicable guidelines and are discussed further in Section 11.4 *'Beneficial uses of groundwater'*.

Chart 1 and Chart 2 present Schoeller Plots of the shallow Brighton Group groundwater chemistry and the deep Brighton Group groundwater chemistry respectively. Chart 3 is a Piper Plot of all the 2011 groundwater data. Based on the results presented in Tables 11-14 and Charts 1, 2 and 3, the groundwater across the site can be characterised in terms of chemistry and geo-chemical evolution.

In Chart 3, on-site wells are shown in black, offsite wells to the east north-east are shown in red, offsite wells to the north and west are shown in orange, and offsite wells to the east of Foote Street and Bridport Street are shown in blue. The three deep OS wells, screened at the base of the Brighton Group, are shown as open circles. Analyses with relatively high TDS concentrations are shown with relatively large symbols. From the interpreted groundwater flow directions in Figure 6, the OS wells and the NE wells are considered to have the potential to be impacted by contamination originating on site.

The SE and NW wells shown respectively in blue and orange are considered to be outside of the local groundwater flow system from the site, due to the sewers acting as hydraulic barriers or the wells being upgradient from the site.

10.3.1 Shallow groundwater wells

Groundwater pH within shallow wells across the site and surrounds is relatively neutral, with an average field pH of 6.8 (April 2011 GME). The mean field pH of the OS, NW, NE and SE wells was 6.6, 7.3, 7.0 and 6.3 respectively in April 2011.

Mean TDS concentrations were approximately 2,000 mg/L in shallow OS wells, 2,500 mg/L in NE wells, 3,100 mg/L in NW wells, and 400 mg/L in SE wells. The individual TDS concentrations are shown in Figure 7 and Chart 1. A qualitative assessment of the relative

magnitudes of the TDS concentrations can also be made from Chart 3, in which the data points with higher TDS concentrations are shown with relatively large symbols.

Concentration contours for the April 2011 GME have been provided for NH_4^+ (Figure 8) and SO_4^{2-} (Figure 9),

SE wells (i.e. GW9, GW10, GW11, GW12, GW13, GW14, GW15, GW16 and GW25) are characterised by low concentrations of TDS ranging from 156 to 548 mg/L and generally dominated by Na-SO_4 (HCO_3) with Mg–Cl sub-dominant. Localised proportionally elevated concentrations of nitrate (NO_3) and fluoride (F) are also consistent with influences from urban activities. These conditions are considered to be background conditions of the local region and correspond with the expected groundwater segment and associated beneficial uses described in Section 7.

OS groundwater wells (i.e. GW1, GW3, GW4, GW19, GW21, GW22, GW23, GW24, GW31, GW39, GW40 and GW41) have a broad range of TDS concentrations from 662 to 4,430 mg/L . There are obvious chemical influences from site impacts, with elevated SO_4^{2-} and NH_4^+ concentrations at GW3, GW19, GW21, GW24, and GW39, shown with square symbols in Chart 3.

It should also be noted that based on the reported TDS results higher within those wells located adjacent to sewers, this suggest that the seawater from the Bay was potentially migrating along the sewers and causing very high TDS values.

Overall, there is a broad range of water types among the OS wells from Na-Cl dominated to Ca- SO_4 dominated. This is likely to reflect a range of temporal and spatial impacts at the site, as well as different rates of recharge at different locations since the decommissioning of the gasworks. The wells with the lowest TDS (e.g. GW22 and GW40) also have a relatively high proportion of HCO_3, which is likely to reflect recent recharge.

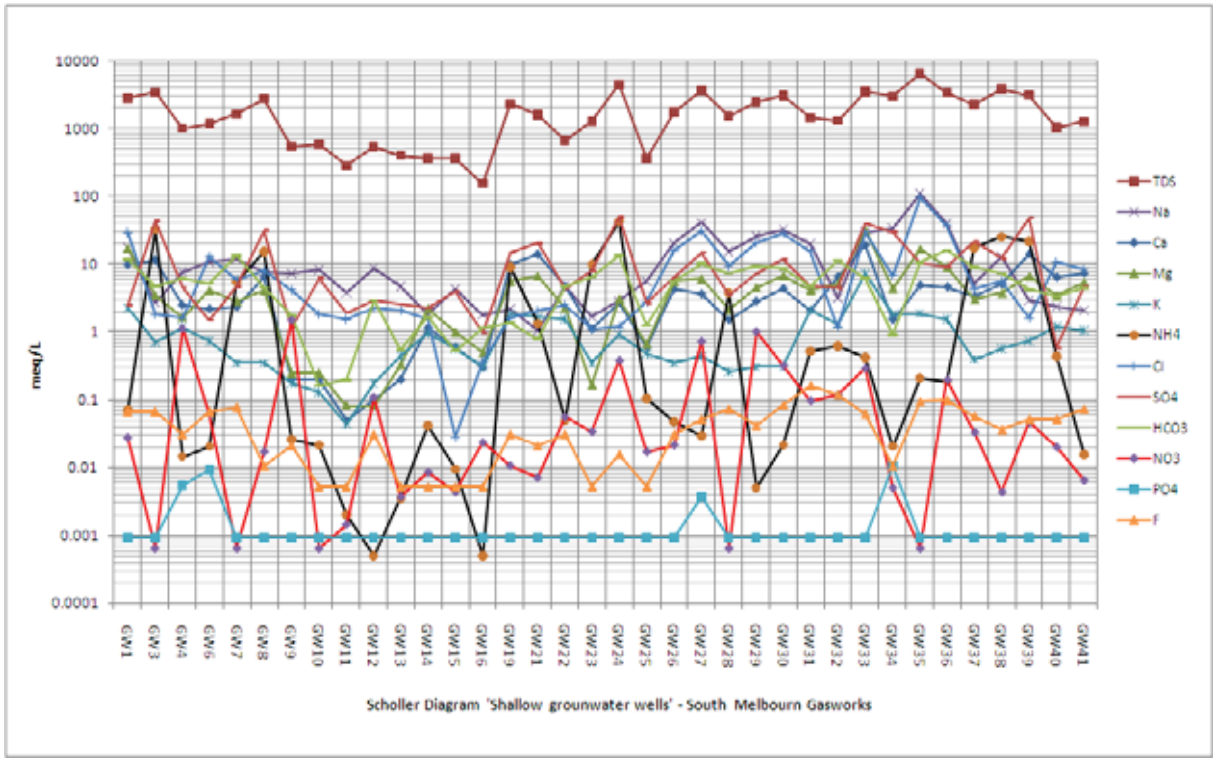


Chart 1: Schoeller Plot. Groundwater Chemistry 'Shallow groundwater wells' – April 2011 GME.

OS wells located in the vicinity of the Pickles Street sewer are generally dominated by Na-Cl with Mg-HCO_3/SO_4 being sub-dominant. Groundwater wells GW32 and GW33 located on the western side of Pickles Street have a different signature, dominated by Ca-HCO_3 and Mg-SO_4 respectively. A more significant change in the chemical signature is observed across the Foote Street/Bridport Street sewer. These changes in chemistry are consistent with the sewers being groundwater sinks that capture all of the groundwater in the Brighton group such that groundwater cannot migrate across the sewers.

NE wells (GW7, GW8, GW26, GW27, GW28, GW29, GW30, GW37 and GW38) have TDS concentrations ranging from 1,540 to 3,770 mg/L and a considerable range in the dominant ions. However, the NE wells are generally more dominated by Na than the OS wells. GW8, GW37, GW38 (and to a lesser extent GW7 and GW28), close to Richardson Street have elevated NH_4^+ and SO_4^{2-}. Although the groundwater flow direction is interpreted in Figure 6 to be approximately parallel to Richardson Street, it is possible that these wells have been impacted by contaminated groundwater migrating from on site

The gradient in the NW wells (i.e. GW32, GW33, GW34,GW36 and GW06) northwest and north of the site are relatively flat and therefore the inferred groundwater flow directions could potentially be moving in almost all directions and therefore the groundwater impacts within the wells could have been sourced from the site or off-site or could be a combination of both. However, due to the presence of the Pickles Street Sewer preventing flow across Pickles Street, the groundwater impact to monitoring wells GW33 and GW32 could be either background concentrations or be coming from an off-site source. On the other hand, in monitoring wells GW06, GW34 and GW36, there is a potential that the groundwater impacts within these wells could be from an onsite source or could be an off-site source (Richardson Street Sewer).

The NW wells do not have same chemistry as the SE wells. In general, the major ions chemistry of the NW wells shows evidence of impacts but does not indicate that the Gasworks site is a source of these impacts with the exception of GW34.

10.3.2 Deeper OS groundwater wells

Groundwater within deeper OS Brighton Group wells is slightly acidic to neutral, with an average field pH of 6.6. The TDS concentration within the three deeper groundwater wells ranged from 8,860 to 23,400 mg/L, with an average TDS of 17,000 mg/L. The TDS concentrations in the deeper OS wells are all greater than the TDS concentration in any shallow well.

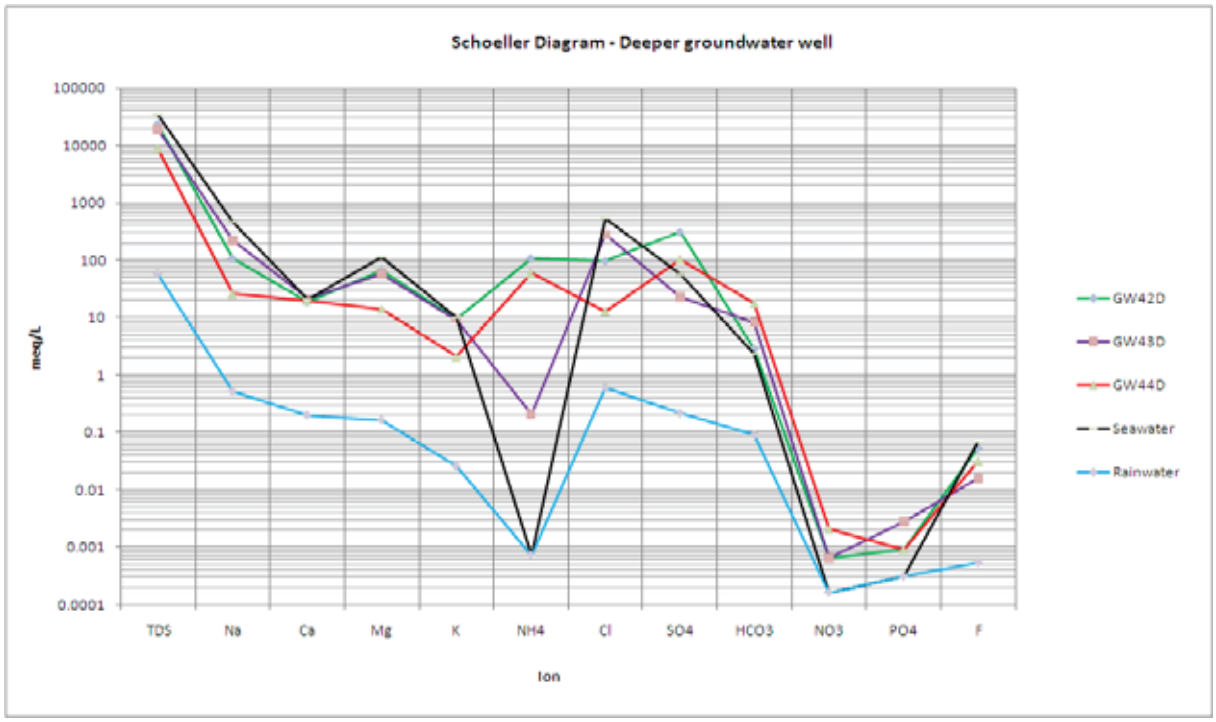


Chart 2: Schoeller Plot. Groundwater Chemistry 'Deeper groundwater wells – April 2011 GME'.

Chart 2 presents the geochemical signatures found within deeper groundwater wells and also includes the geochemical signatures of seawater and rainwater for comparison. The Piper Plot prepared for the wells sampled in April 2011 has been included as Appendix J and shows that the deeper wells are generally dominated by Na-SO_4, although GW43D is dominated by Na-Cl. NH_4^+ concentrations are elevated in wells GW42D and GW44D, in addition to SO_4^{2-}. Elevated concentrations of NH_4^+ and SO_4^{2-} were observed in shallow wells in the same areas. The geochemistry signature at well GW43D (Na-Cl>Mg-SO_4) is similar to that of seawater, apart from slightly elevated NH_4^+.

The elevated concentrations of TDS in the deeper wells are considered most likely due to gasworks contamination rather than upwelling of relatively high salinity groundwater from the Older Volcanics. GW-42D and GW-44D are located towards the down-gradient ends of the local on-site groundwater flow system and in the vicinity of or down-gradient from, areas of purifiers. Gas purifiers in the north east corner of the site were above ground and those in the south east corner of the site were below ground (Environmental Earth Sciences, 2010). It is also possible that recharge over the site since gasworks operations ceased in the 1970s, and the site was first grassed in the 1980s, has displaced more heavily impacted groundwater towards the site boundaries, i.e. towards the down-gradient ends of the local groundwater flow system.

Note that it may be possible for relatively high salinity water and alkalinity to migrate laterally to some extent via preferential pathways along sewer lines that are below sea level, especially those well located within the vicinity of these sewers. However, this is not considered to be a possible reason for elevated TDS in bores installed in the natural ground at this site. This is because the hydraulic gradient would be consistently towards the sewers such that any groundwater migrating laterally along the outside of a sewer would not move away from the sewer but would ultimately be captured by the sewer.

10.4 Consideration of contaminants of concern

As indicated from previous and current groundwater investigations, groundwater at the site is contaminated with common gasworks contaminants including heavy metals (primarily, As, Co, Cu, Pb and Zn), NH_4^+, CN, SO_4^{2-}, PAHs, TPHs and MAHs.

Samples analysed for metals concentrations were collected without filtering in the field and without preservative. These samples were filtered by the laboratory before preservation with acid and subsequent analysis. Where dissolved Al is subsequently detected in samples with a pH >5.5 and <8.5, this result can be termed a potential 'false positive' as Al is only soluble in water at pH values <5.5 and >8.5. Thus, dissolved Al (and potentially other associated metals and metalloids) detected in groundwater with a pH >5.5 (e.g. GW42D and GW16) may indicate an overestimate of the dissolved metals concentrations at these locations.

10.4.1 Dissolved heavy metals

Dissolved heavy metals concentrations vary over the site and offsite which indicates both localised sources across the site (i.e. buried waste) and the potential for sources of groundwater contamination in the vicinity of the Gasworks site other than the site itself. SE (background) wells reported concentrations of As, Co and Pb (0.008 mg/L), Cu (0.007 mg/L) and Zn (0.045 mg/L) above adopted criteria. It is considered likely that these concentrations represent background conditions.

Similar concentrations of dissolved Co, Cu and Zn were also detected in the NW wells and the NE wells and most of the OS wells. Dissolved Pb concentrations were generally similar in the OS wells (and in the NW and SE wells) to the SE (background) wells. However, Co, Cu and Zn were detected at greater concentrations in some OS wells, with the greatest concentrations of 9.66, 0.051, 2.2 mg/L respectively detected in deep well GW42D. As discussed in Section 4.2 above, these results may be false positives due to the detection of dissolved Al (3.91 mg/L) at a groundwater pH of 6.3.

Concentrations of As were approximately an order of magnitude greater in the NE wells than in the SE (background) wells, and up to approximately two orders of magnitude greater than background in the NW wells. Concentrations of As in OS wells were generally above background (SE wells) but below the concentrations in the NW wells, with the exception of OS well GW19 in which the highest concentration of As was detected of all the wells, at 0.799 mg/L. Since these bores are higher than those we consider to be background concentrations, the As detected in these bores could be attributed to contamination sourced from the site.

Detectable concentrations of dissolved aluminium were identified within the following wells:

- OS - GW19, GW21, GW42D and GW31;
- NE – GW30;
- SE – GW10, GW11 and GW16.

Suspended solids present in the samples may have contributed to the detected concentrations of Al, Pb, Cu, Pb, Zn in some wells, particularly where groundwater pH is in the range 6-9 and dissolved Al has been detected (Al is not soluble at pH greater than 5.5).

In particular, OS well GW42D reported concentrations so significantly elevated above all other samples as to be classified as outliers for aluminium (3.91 mg/L), cobalt, manganese, nickel and zinc. In addition, GW42D reported selenium at a concentration which exceeded all adopted criteria. Thus, the generally high metals concentrations in this well may be due to

the effects of sediment in the sample (very likely given a field and laboratory measured pH of 6.3) or of a high proportion of micro-colloids <0.45 µm in diameter in the sample.

For example, Hem and Lind (1974) and Hem (1992) state that metals such as Fe and Al in particular are adsorbed to organic complexes and micro-colloids of minerals such as gibbsite and kaolinite in groundwater that have a particle diameter <0.45 µm. Hem and Lind (1974) determined that Fe "macroions or microsilicate forms approaching the composition $Fe(OH)_3$ may often be present in natural water", while Al "polymers continued growing until they became crystalline gibbsite [$Al(OH)_3$] particles a few hundredths to a few tenths of a micrometer in diameter." Thus the concentrations recorded in GW42D are likely to be a reflection of colloidal or suspended sediment concentrations, rather than dissolved.

However, the observation of relatively high concentrations of Co, Cu and Zn in some OS wells is unlikely to be due to the effects of suspended solids in unfiltered samples, as several wells showed elevated concentrations of these metals and the pH in these wells is generally relatively low.

10.4.2 Miscellaneous inorganics

There are significant impacts of ammonia (NH_4^+) on site as well as in an area off site beneath residential properties to the northeast of Richardson Street (Figure 8). Sulfate (SO_4^{2-}) concentrations are elevated in the same areas (Figure 9). This is consistent with previous groundwater monitoring undertaken in 2006 and 2007 (Golder Associates 2006a and 2007a). In the eastern corner of the site and off-site to the northeast of Richardson Street, the area of NH_4^+ and SO_4^{2-} contamination is quite extensive. The concentrations of NH_4^+ and SO_4^{2-} are generally greatest in the NE wells that are closest to the site, which is evidence that the contamination originated from on site.

Among the shallow OS wells, elevated concentrations of NH_4^+ and SO_4^{2-} at GW3 and GW39 are likely to be due to an on-site source, and, although the interpreted groundwater flow direction beneath Richardson Street is parallel to, rather than across, the street (Figure 6), there is sufficient uncertainty in the groundwater flow direction and how this may have varied with time that elevated concentrations of the same analytes to the north east of Richardson Street may have originated from the same source.

As previously reported, potential on-site sources of NH_4^+ and SO_4^{2-} contamination are the former gas purifiers that were located in the north-eastern (above-ground) and south-eastern (below-ground) portions of the site. The gas purifiers were used for removal of sulphur from the gas and were typically filled with iron oxide or lime.

Total cyanide concentrations also show a large range on- and offsite. Total cyanide concentrations in the SE (background) wells are less than or equal to 0.014 mg/L and no free cyanide was detected in this area. In the NW wells, total cyanide concentrations were approximately an order of magnitude greater than in the SE wells. The highest concentration of total cyanide detected in the NW wells was 0.24 mg/L in well GW34, which also has a relatively high sulfate concentration (Section 10.2.1). Free cyanide concentrations were less than 0.006 mg/L in all NW wells.

In the OS wells, total cyanide concentrations were generally an order of magnitude greater than in the SE (background) wells. However, the highest concentrations of cyanide in any wells were in deep wells GW42D and GW44D, at 0.434 and 3.98 mg/L respectively. These wells also had the highest concentrations of free cyanide of any wells, at 0.013 and 0.186 mg/L, and the highest concentrations of TDS, NH_4^+ and SO_4^{2-}.

In the NE wells, total cyanide concentrations were generally similar to the SE (background) wells, except in GW07, GW08, GW37 and GW38 along Richardson Road, which had concentrations between 0.014 (in GW08) and 0.39 mg/L (in GW37).

CN in the groundwater is likely to be a result of a number of sources and/or buried waste across the site. From the proportionally large amounts of complex cyanide compared to free cyanide, it could be interpreted that factors other than contamination from gasworks (such as upwelling of high salinity groundwater from greater depth) may be contributing to the elevated total cyanide concentrations. However, another possibility is that the free cyanide sourced from the gasworks has been complexed as part of natural aquifer hydrochemical processes. . When cyanide is complexed it is less bio-available hence less toxic than in its free or even WAD form.

Concentrations of weak-acid dissociable (WAD) and free cyanide were either below or slightly above the laboratory LOR. Where the concentrations were greater than the LOR, they were a very small proportion of the total CN concentration, further indicating that much of the CN is complex and has very low bioavailability.

The relatively high concentrations of cyanide in the shallow NE wells which are off site but close to Richardson Road, combined with the high concentrations in deep wells GW42D and GW44D, and associated with high concentrations of NH_4^+ as well as SO_4^{2-}, suggest an on-site source or sources of the CN contamination both on site and in the off-site area near the corner of Richardson Street and Foote Street. The ferrocyanide plant at the gasworks was located on the north-eastern boundary of the site on Richardson Street (EES, 2010).

All CN, NH_4^+ and SO_4^{2-} contamination in groundwater in the eastern part of the site and off site to the east of Richardson Street is captured by the South Yarra main sewer which is aligned along Bridport Street and Foote Street. On its way to the sewer, the NH_4^+ and SO_4^{2-} plume to the east of the Richardson Street passes beneath a number of residential properties before discharging to the sewer. These properties are:

- 17, 19, 21, 23, 25, 27, 29, 31, 33 and 35 Richardson Street;
- 43, 45,49, 51, 53, 55 Greig Street; and
- 270 and 268 Bridport Street.

10.4.3 Organics

Significant elevated concentrations of organic compounds PAHs, MAHs and TPHs are found within the south-eastern corner (i.e. shallow well GW24 and deeper well GW42D) and north-eastern corner of the Site (i.e. deeper well GW44D). During the drilling of wells GW42D and GW44D, organics odours were detected. These odours noted are reflected in the elevated concentrations of naphthalene toluene and ethylbenzene in GW44D and benzene and total TPH in both wells. Elevated PAHs were also detected within the east central part of the site (wells GW3, GW4 and GW 39). The organic contamination is likely to be from a variety of on-site sources, including buried waste and historic infrastructure such as liquor wells and tar tanks.

Elevated concentrations of dissolved PAHs (primarily BaP) were also detected within wells GW40 and GW41 situated on the groundwater flow divide (Figure 6) in the northern part of the site between Gasworks Park and the Alinta Site. These wells are located in an area of very low hydraulic gradient such that the rate of groundwater movement and transportation of PAHs is interpreted to be limited in this area. There is no identifiable source of these PAHs within this area, with the exception of buried waste. Elevated concentrations of PAHs were not detected in monitoring wells GW1, GW 31 or GW21 located to the west, south west and

south east of GW40 and GW41. Based on the low hydraulic gradient, the likely source of PAH impacts (which is limited in its capacity to impact groundwater) and the insolubility of PAHs, it is considered unlikely that contaminated groundwater at Gasworks Park would migrate to the north west beneath the Alinta Site and pose a risk to off-site users.

PAHs were detected in wells GW7, GW8, GW37 and GW38, which are located along the north side of Richardson Road in the NE group of wells (Table 17). PAHs were not detected in any other offsite NE, NW, or SE wells.

10.5 Beneficial uses of groundwater

The watertable beneath the site is within the Brighton Group sediments. Groundwater onsite within the Brighton Group aquifer has been classified according to the State Environment Protection Policy (SEPP) 1997, *Groundwaters of Victoria (GoV)* publication (SEPP *GoV*), using the laboratory TDS levels reported for the April 2011 GME. Groundwater encountered beneath the site ranges between Segment A and Segment D. As displayed in Table 2, most TDS results classified groundwater as Segment B. However in reference to the SEPP, groundwater should be assessed in comparison with the most sensitive beneficial uses (i.e. Segment A_2), i.e.:

- maintenance of ecosystems;
- potable water supply (acceptable);
- potable mineral water;
- agriculture, parks and gardens (irrigation);
- stock watering;
- industrial water use;
- primary contact recreation; and
- buildings and structures.

As Gasworks Park and Southport are owned by the CoPP and the State of Victoria, abstraction of groundwater onsite can be effectively controlled through management, should any of these beneficial uses be precluded. By preventing the use of groundwater on the site, the risks associated with this exposure pathway will be reduced to an acceptable level. The abstraction of groundwater at both of these sites is currently being controlled by an Interim Site Contamination Management Plan.

10.5.1 Maintenance of ecosystems

The following water quality indicators exceeded ecological based criteria:

- CN;
- NH_4^+;
- heavy metals: As, Co, Cu, Pb, Ni, Se and Zn;
- PAHs, specifically naphthalene, phenanthrene, anthracene, fluoroanthene and BaP;
- benzene, toluene and ethyl benzene; and
- TPH (C_6-C_9 and C_{10}-C_{38}).

The protection and maintenance of ecosystems was a potential beneficial use of all groundwater in the Brighton Group sediments beneath the site prior the construction of the sewers. The nearest significant ecological receptors are the waters and sediments of Port Philip Bay, 350 m south-west of the site. Due to the fact that all groundwater from Gasworks Park Precinct discharges to the Melbourne Water Sewer System (Section 4.2.1 and Section 10.1), the groundwater from the site does not support any ecosystem and this beneficial use does not require consideration. Therefore, this beneficial use is considered to be precluded, however, although not relevant at this time may require protection in the future should hydrogeological conditions change.

10.5.2 Potable water supply (acceptable)

All values presented in red for inorganic and organic chemicals in Tables 11-18 indicate concentrations in excess of the NHMRC (2004/2011) *Australian Drinking Water Guidelines*. These include:

- pH (aesthetics only);
- TDS (aesthetics only);
- SO_4^{2-};
- Cl (aesthetics only);
- CN;
- fluoride;
- nitrate;
- heavy metals: Al, As, Bo, Cd, Mn, Ni and Se; and
- BaP, styrene, benzene, xylenes and TPH (C_6-C_9 and C_{10}-C_{38}).

As the Albert Park area and the Brighton Group aquifer are not sources of potable water supply and the abstraction of groundwater is being prevented by an ICMP, this beneficial use does not require further consideration. Therefore, this beneficial use is considered to be precluded but not relevant and does not require protection in the future.

10.5.3 Potable mineral water supply

To the north and west of the site, in areas considered to be outside of the potential impact area of the site, the TDS is above 2,500 mg/L in most of the monitoring wells. Therefore, the quality of much of the non-impacted groundwater in the vicinity of the site would not support this beneficial use.

As the Albert Park area and the Brighton Group aquifer are not sources of mineral water supply and the abstraction of groundwater on site is being prevented by an Interim Site Contamination Management Plan, this beneficial use does not require consideration. Therefore, this beneficial use is not relevant and does not require protection in the future.

10.5.4 Water supply: Irrigation

Irrigation is a potential beneficial use based on the TDS and major ions concentrations in the SE (background) wells. However, to the north and west of the site, in areas considered to be outside of the potential impact area of the site, the TDS is above 2,500 mg/L in most of the monitoring wells and is above 3,500 mg/L in several of the wells.
The likelihood of abstraction of groundwater from the Brighton Group for irrigation purposes is considered to be extremely low due to:

- the residential urban setting surrounding the site;

- the low yield of the Brighton Group aquifer; and
- the availability of reticulated water in the area (for domestic irrigation use).

However, in the residential area to the north east of the site, despite the low likelihood of the use of the groundwater for irrigation purposes, this potential beneficial use cannot be completely discounted in this area.

10.5.5 Water supply: domestic and stock use

The search of the groundwater database (Section 5.2.3) indicated that 9 wells located within 1 km; 13 wells located with 1-2 km; and 8 wells located with 2-3 km radius of the site are registered for stock and/or domestic usage. Groundwater wells installed for this purpose were between 3 – 32 metres in depth within sand, Older Volcanics basalt (>17 m BGL), and sand/marl geological units.

Naturally occurring TDS concentrations exceeded the livestock watering guideline (3,000 mg/L) in five onsite, and nine off site wells (Section 9.2). Concentrations of certain metals, major ions and boron exceeded stock water criteria at some locations.

Given the urban setting of the site, the fact that all groundwater discharging from the site is captured via the surrounding sewer network, the availability of reticulated mains water, the low yield and controls over groundwater extraction, it s considered highly unlikely that groundwater will be extracted for this use.

However, in the residential area to the north east of the site, despite the low likelihood of use of the groundwater for stock/domestic purposes, this potential beneficial use cannot be discounted in this area.

10.5.6 Industrial use

All groundwater beneath the site needs to consider industrial application as a potential beneficial use. As water quality indicators for industrial use are very specific, complete assessment of all potential uses is beyond the scope of this study. However, it can be generally stated that natural TDS (as specified in the SEPP GoV (1997)) and CoPC concentrations exceed acceptable thresholds for industrial applications of this water.

The Brighton Group aquifer is not a current source of industrial water supply, and this aquifer is unlikely to be used for this purpose in the near future. The yield of the aquifer is unlikely to be sufficient for such purposes as industrial processes usually require reasonably large volumes of water. No groundwater wells exist for this use or are registered within 3 km of the surrounding area and given the low yield and elevated salinity in areas of local groundwater it is unlikely that such use exists.

Based on this data, industrial water use is considered to be a precluded beneficial use. However, as the site setting is not industrial use and since well yield is low, industrial water use is considered to be a very unlikely use. Therefore, although this beneficial use is likely to be precluded, it is not relevant on- or offsite and does not require protection in the future.

10.5.7 Primary contact recreation

Primary contact recreation is a potential beneficial use for all groundwater beneath the site. However, as the site is located within a highly urbanised area serviced by reticulated water, the yield of the Brighton Group is low, and discharge of all groundwater from Gasworks Park Precinct is to the Melbourne Water Sewer System, the likelihood of the use of groundwater migrating from Gasworks Park for recreational use is considered to be low.

Notwithstanding the low likelihood, Environmental Earth Sciences VIC investigated the number of residential swimming pools within 600 metres of the site from aerial photographs. A total of 27 outdoor swimming pools were identified (refer to Figure 12). All pools are considered to be outside the area of groundwater contamination associated with the Gasworks Park precinct (i.e. beyond sewers), with the exception of the following two locations:

- 7 Richardson Street, Port Melbourne – 50 m north; and
- 266 Bridport Street, Port Melbourne – 80 m north-east.

The property located at 7 Richardson Street is up-gradient from the site, however, 266 Bridport Street is down-gradient from the site and in an area of elevated NH_4^+ and SO_4^{2-} concentrations in the groundwater. Review of the DSE '*Groundwater Database'* indicated no groundwater wells within a 3 km radius of the site are registered for extraction and no wells are registered for any uses at the above location. Therefore, it can be concluded that the swimming pools at the above addresses are filled from other sources than local groundwater.

Considering the availability of reticulated mains water and the low yield of the Brighton Group, it is unlikely that an abstraction well would be drilled for the purpose of filling a swimming pool, however, is still a possibility and must be assessed.

As indicated in NHMRC 2008 (Table 9.3 on page 155), consumption of water during recreational events (i.e. in creeks or swimming pools using groundwater) has been considered, with criteria being set at 20 times the health criteria based on the assumption that recreational swimmers consume 100 mL of water per session, while NHMRC (2004/2011) drinking criteria assumes 2 L/day potable water consumption (also reported in ANZECC 1992, p3-7).

The closest groundwater well to 266 Bridport Street, Port Melbourne is GW30, which is therefore most representative of groundwater that potentially may be extracted to fill the swimming pool at this property. All ions, including sulfate and ammonia, heavy metals and organic CoPC are below primary contact recreation criteria and therefore do not preclude this beneficial use at this location.

Elevated concentrations of As in some wells (onsite, offsite and background) are likely to be associated with naturally occurring As within the Brighton Group sediments. Also, elevated concentrations of Al, identified at groundwater wells GW19, GW21 and GW31 and As and Ni concentrations in well GW42D are likely to reflect the presence of suspended solids in the samples rather than to be representative of dissolved concentrations.

Concentrations of CN, NH_4^+, BaP, styrene, benzene, xylenes and TPH fraction C_6-C_9 and fraction C_{10}-C_{36} within some wells represent a potential risk for groundwater extraction (i.e. filling a swimming pool). However those wells closest to the two at risk swimming pools indicate groundwater in the immediate vicinity of the pools does not preclude this beneficial use as they are located up-gradient or to the side of impacted groundwater plume areas.

As the groundwater is effectively captured by the surrounding sewer system and transported elsewhere, there is minimal risk of groundwater and CoPC discharging into Port Phillip Bay. This eliminates the exposure risk of for recreational users of Port Phillip Bay.

Notwithstanding the low likelihood of use of the groundwater for primary contact recreation in the residential area to the north east of the site, this potential beneficial use cannot be discounted in this area.

10.5.8 Buildings and structures

Buildings and structures is a potential beneficial use for all groundwater beneath the site. The depth to groundwater across the site is between 6 and 10 mbgl (Table 9) and groundwater levels are permanently drawn down by the sewers. Therefore, footings and foundations are unlikely to come into contact with the groundwater unless they extend to more than 6 mbgl.

Based on the average Ryzner Index (RI) value >1 (average 18.16) and Langelier Saturation Index (LSI) value <-3 (average -5.7), relatively neutral pH (average 6.80), and average sulfate concentration of 1,075.8 mg/L, groundwater beneath the site is considered to be slightly corrosive. This information should be considered and it is recommended that the structural/design engineer for any future development proposed at the site should make an independent assessment of the sub-surface conditions in order to develop an appropriate specification for the materials for sub-surface structures including footings and foundations.

Buildings and structures is not considered to be a precluded beneficial use.

10.6 Trade waste agreement

As part of the specific obligations, Melbourne Water noted that it accept would groundwater provided that it "*maintain the right acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets or does not comply with trade waste requirements or safety requirements imposed by the Victorian Government from time to time*".

In reference to Melbourne Water specific obligations, groundwater concentrations at the site have been compared with South East Water '*Standards for trade waste discharge to the sewerage system*', presented in Appendix G.

Concentrations that exceeded the maximum allowable value for discharge to the sewerage system include:

- pH in two OS wells (GW19 and GW21) and two SE wells (GW10 and GW11);
- SO_4^{2-} in all OS wells with exception to GW40, all NW wells with exception to GW6, all NE wells and all SE wells with exception to GW9, GW11 and GW16;
- NH_4^+ in six OS wells (GW3, GW23, GW24, GW39, GW42D and GW44D) and three NE wells (GW8, GW37 and GW38);
- Mn in three OS wells (GW19, GW42D and GW44D);
- Fe in one OS well (GW19);
- benzene and TPH fraction C_6-C_9 in two OS wells (GW24 and GW44D); and
- xylenes in one OS well (GW24).

Please note these standards are discharge of waste from land to the sewer and were not intended to address groundwater discharging directly to sewers.

11 CONCLUSIONS AND RECOMMENDATIONS

As part of the former South Melbourne Gasworks 53V audit (undertaken by Dr. Peter Nadebaum of GHD), Environmental Earth Sciences VIC has undertaken (on behalf of CoPP) a further groundwater investigation. The objectives of this groundwater investigation were to advance understanding of hydrogeological and hydro-geochemical data related to the site and investigate potential sources for all CoPC detected in the groundwater.

11.1 Groundwater flow system

The hydrostratigraphy on site and in the vicinity of the site consists of Brighton Group sediments overlying the Older Volcanics. Groundwater flow through the full saturated thickness of the Brighton Group sediments is mostly controlled by deep sewers which border the site on three sides, i.e. Foote Street/Bridport Street to the south east, Graham Street to the south west and Pickles Street to the north west. The water table on site is drawn down several metres below its natural level by the sewers such that it is several metres below sea level throughout the area of the site and the surrounding vicinity, and the upper 7-8 m of the Brighton Group and overlying fill are generally unsaturated. The majority of the groundwater on site ultimately flows to the sewers beneath Foote Street/Bridport Street and Graham Street as they are deeper than the sewer beneath Pickles Street.

The groundwater flow system through the Brighton Group on site is interpreted to have the following additional characteristics:

- nearly all of the groundwater flow in the Brighton Group beneath the site has been recharged by infiltration from the ground surface on site;
- there is an upward gradient from the underlying Older Volcanics to the Brighton Group such that contaminated groundwater cannot migrate below the Brighton Group. Due to this gradient, there may also be some minor upward leakage into the Brighton Group flow system from the underlying Older Volcanics; however, this flux is considered to be small in comparison to the flux derived from on-site recharge;
- most of the groundwater discharging from the site is captured by the sewers with exception to the northern portion of the site (via Richardson Street Sewer);
- lateral groundwater flow towards the sewers takes place through the full saturated thickness of the Brighton Group. However, the greatest lateral flux takes place through the layers of greatest K. Over most of the site, the saturated thickness of the Brighton Group is approximately 10 m;
- the oldest groundwater within the Brighton Group on site is likely to be closest to the sewers towards the downgradient end of the longest flow paths, within the relatively low K zones of the Brighton Group, and/or in areas of relatively low hydraulic gradient;
- the median K of the Brighton Group at the site was evaluated from slug tests to be approximately 0.3 m/day. K was observed to decrease with depth in the Brighton Group; and
- the average linear velocity of the groundwater flowing laterally through the Brighton Group over most of the site is estimated to be approximately 5 m/yr.

Based on the interpreted aquifer properties and hydraulic gradients, the total flux of groundwater from the site to the surrounding sewers from Gasworks Park and Southport Community Nursing Home is estimated to be approximately 11 m^3/day, (4 ML/yr). From this estimate of the discharge rate, the average recharge rate across the site was estimated to be approximately 0.1 m/yr.

Within the Brighton Group, there are slight upward hydraulic gradients at some locations and downward gradients at other locations. These could be caused by different rates of recharge at the water table in both location and time (due to short-term variations in climate). Localised vertical gradients could also be due to heterogeneities within the Brighton Group.

11.2 Groundwater contamination

Groundwater at the site is impacted with common gasworks contaminants, including heavy metals (primarily, As, Co, Cu, Pb and Zn), NH_4^+, CN, SO_4, PAHs, TPHs and MAHs. However, there is no evidence of either DNAPL or LNAPL existing onsite.

The distribution of the groundwater contamination is consistent with the former gasworks infrastructure and the physical groundwater flow system described above, in which it would be expected that the full saturated thickness of the Brighton Group would have been impacted, particularly in the vicinity of the sewers. The greatest concentrations of TDS, SO_4^{2-}, NH_4^+, CN and many organics in 2011 were detected in monitoring wells screened at the base of the Brighton Group near the perimeter of the site in the vicinity of former gas purifiers towards the downgradient end of the flow system. This contamination is interpreted to have originated on site. The groundwater in the Brighton Group is not interpreted to have been significantly impacted by the upwelling of higher salinity groundwater via the underlying Older Volcanics in comparison to the impacts from the Gasworks site.

The relatively low contaminant concentrations towards the centre of the site in comparison to the site perimeter could be due to less contamination originating from the central part of the site but may also reflect some flushing of the on-site flow system with less contaminated recharge since the site ceased to operate as a gasworks in 1971.

As all the groundwater migrating from the site is captured by the sewers, all the contaminants dissolved in the groundwater are also captured by the sewers. Due to the proximity of the sewers to the site boundaries, for the most part, the contaminated groundwater from the site migrates directly to the sewers without passing beneath neighbouring properties. However, there is an area to the northeast of Richardson Street where there is a plume of the NH_4^+ and SO_4^{2-} contamination that migrates beneath up to 18 properties en route to the South Yarra Sewer Main beneath Bridport Street. Relatively high concentrations of CN have also been detected in groundwater samples from this area. Therefore, although the current groundwater flow direction is interpreted to be not across, but parallel, to Richardson Street, the Gasworks site is considered likely to be the original source of this area of groundwater contamination.

Elevated concentrations of PAHs (primarily BaP) were detected within newly installed groundwater wells in an area of very low hydraulic gradient in the northern part of the site, close to the Alinta Site. There is no identifiable source of these PAHs within this area, with the exception of buried waste. Based on the low hydraulic gradient, the likely source of PAH impacts (which is limited in its capacity to impact groundwater) and the insolubility of PAHs, it is considered unlikely that contaminated groundwater at Gasworks Park would migrate to the north west beneath the Alinta Site and pose a risk to off-site users.

11.3 Potential beneficial uses

Based on the TDS values considered to be background in the general area of the SMG, the groundwater has been classified as 'Segment A_2', with a TDS range of 501-1,000 mg/L. The wells considered to be representative of background conditions (i.e. represented by the south east [SE] wells) in the vicinity of the site confirm this classification based on TDS. However, it should be noted that there are wells with TDS greater than 3,500 mg/L to the north and west of the site that are considered to be outside of the potential impact area of the site, due to sewers acting as hydraulic barriers or the wells being up-gradient from the site. Therefore, the quality of some of the non-impacted groundwater in the vicinity of the site does not support some of the protected beneficial uses.

The Department of Sustainability and Environment (DSE) 'Groundwater Database' indicates that the primary purpose of groundwater wells installed within the watertable aquifer in the vicinity of the site is for investigative purposes. However, this database indicates that some of the wells were installed for stock/domestic (12%) and irrigation (3%) purposes. None of the listed wells were installed for water supply or mineral water purposes and the Brighton Group in general, is not known to be used for these purposes. In this urban environment with a municipal reticulated water supply, the potential beneficial uses of potable water and mineral water supply are not considered to be realistic potential beneficial uses.
Recent monitoring confirms that all groundwater from the site ultimately flows to the surrounding sewer system (Section 11.1). Therefore, all contaminants being transported in groundwater from the site are captured by the sewer system, and ultimately discharge to the Werribee Treatment Plant. As such, there is negligible risk of impacted groundwater from Gasworks Park discharging to receiving waters (i.e. ecosystems) in the vicinity of the site.

The remaining potential groundwater beneficial uses to be considered are:

- agriculture, parks and gardens (irrigation);
- stock watering;
- industrial water use;
- primary contact recreation; and
- buildings and structures.

As the site is owned by the City and the State of Victoria, the abstraction of groundwater onsite for any purpose can be prevented. The abstraction of groundwater is currently being controlled by an ICMP, because of the groundwater impacts beneath the site. Therefore, on site, the above potential beneficial uses, with the exception of buildings and structures, are considered to be precluded.

However, in the area of gasworks-related groundwater contamination beneath private residences to the northeast of Richardson Street and northwest of Bridport Street, the abstraction of groundwater is not currently prevented. In this area, the saturated thickness of the Brighton Group is limited to less than 10 m by the drawdown caused by the South Yarra Sewer Main. This, combined with its relatively low hydraulic conductivity, means that the potential yield of water wells in the Brighton Group in this area would be no more than a few litres/minute. This physically limits the usefulness of the resource. However, notwithstanding this limitation, the potential beneficial uses of primary contact recreation, irrigation and stock/domestic cannot be discounted in this area.

11.4 Trade waste agreement

A '*Deed of Agreement Groundwater and Gasworks Arts Park, Albert Park'* exists between CoPP, Melbourne Water and South East Water. This '*Deed of Agreement'* states that Melbourne Water and South East Water acknowledge that groundwater from the Gasworks Site enters the South Yarra Main and Hobsons Bay Main and the Pickles Street Branch Sewer respectively, and that these mains and sewer act as a control for groundwater. Both have agreed to accept groundwater that enters the Gasworks Site into the mains and sewer, provided that they maintain the right, acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets.

Assessment of groundwater samples collected during the August 2011 GME compared against South East Water '*Standards for trade waste discharge to the sewerage system* indicated a number of dissolved chemicals exceed maximum allowable concentrations and/or values for discharge to the sewerage system.

11.5 Risks associated with the groundwater contamination

As all the groundwater flowing from the site is captured by the sewer system, it is ultimately pumped to the Werribee Treatment Plant. The flux of groundwater from the site is several orders of magnitude less the total flow rate of sewage through the sewers to the Werribee Treatment Plant. Therefore, although several dissolved chemicals exceed the criteria for discharge to a sewerage system, contaminant concentrations are diluted by several orders of magnitude. Therefore, associated risks to workers at the treatment plant would be very low. Furthermore, the personal protective equipment routinely used by workers working on the sewers themselves would protect them from any additional contaminants introduced into the sewers from the site.

As stated above, the capture of the groundwater by the sewers also means that there is negligible risk to ecosystems. Even if all the sewers in South Melbourne were sealed such that the natural groundwater flow system to Port Phillip Bay were restored, the hydraulic gradient towards the Bay would be so low that the groundwater would move towards the Bay at a rate that is at least an order of magnitude less than the current rate of groundwater flow towards the sewers and the travel time would likely be thousands of years. The volumetric rate of discharge to the Bay would, therefore, be very low when the contaminants ultimately reached the Bay.

In the impacted area to the north east of the site, the risks associated with it are considered to be negligible *in-situ*. Any potential risks related to the contamination would be associated with the extraction of the groundwater. Although it is considered unlikely that the local residents would extract groundwater in this area, it is currently feasible for groundwater extraction to take place.

GQRUZs are areas of aquifers identified by EPA Victoria where one or more beneficial uses are precluded by pollution. Implementation of a GQRUZ would significantly reduce the risks associated with groundwater extraction in this area.

As Gasworks Park and Southport are owned by the City and the State of Victoria, the abstraction of groundwater onsite can be effectively controlled through management to prevent the use of groundwater on the site to reduce the risks associated with this pathway to an acceptable level. The abstraction of groundwater at both of these sites is currently being controlled by an ICMP.

11.6 Recommendations

We understand that CoPPs obligations under the '*Deed of Agreement*' include the following:

- prepare a Monitoring Plan and submit it to Melbourne Water and South East Water for approval;
- continue to monitor groundwater contamination at, and in the vicinity of, the South Yana Main, Hobsons Bay Main and Pickles Street Branch Sewers in 'accordance with the Monitoring Plan;
- supply data relating to groundwater recorded or obtained in the course of implementing the Monitoring Plan to Melbourne Water and South East Water;
- notify Melbourne Water and South East Water of any groundwater changes in accordance with the Monitoring Plan; and
- have and implement a contingency plan to manage the contamination risks posed by groundwater to meet EPA requirements should Melbourne Water or South East Water undertake work to its sewer which increases risks associated with groundwater contamination from the site to an unacceptable level.

Groundwater from the site has not been sampled and analysed since April 2011. It is possible that, in some parts of the site, contaminant concentrations in groundwater are reducing with time as the site has not operated as a gasworks since the early 1970s. Therefore, we recommend a GME takes place during the next several weeks to months. We do not consider it necessary to sample all the wells. The sampling plan should prioritise select OS and NE wells. We also recommend a rationalisation of the suite of analytes to further optimise the cost effectiveness of the GME.

We recommend that the mass flux of contaminants discharging to the sewers is revisited and the associated lack of unacceptable risk to the sewer system and the treatment plant is confirmed.

We recommend a review of possible management/remediation strategies for the area of groundwater contamination to the north east of the site. This review would include consideration of the potential cost, benefit, duration, practicality, environmental footprint and risks of approaches to remediation in this area, in comparison to the current situation in which all this groundwater is captured by the sewer system.

We also recommend that a GQRUZ be considered that would cover the area of interpreted gasworks-related groundwater contamination to the north east of the site. This would cover an area of approximately 20-30 private properties.

12 REFERENCES

Australian and New Zealand Environment and Conservation Council (ANZECC) and ARMCANZ, 2000. *Australian and New Zealand guidelines for fresh and marine water quality;*

ANZECC, 1992a. *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites;*

ANZECC, 1992b. *Water quality guidelines for fresh and marine waters;*

Barlow, Paul M, 2003, *Groundwater in Freshwater-Saltwater Environments of the Atlantic Coast, U.S. Geological Survey Circular*: 1262.

Biodiversity Committee, 2003. *Minimum construction requirements for water bores in Australia*;

Dahlhaus, P., *et al,* 2004. *Port Phillip and Westernport Groundwater Flow Systems*. Port Phillip and Westernport Catchment Management Authority.

Environment Protection and Biodiversity and Conservation Act (1999) including Policy Statement 1.2 and the Bilateral Agreement between the Commonwealth and the State of Victoria, regarding environmental assessment, made on June 2009 under Section 45 of EPBC Act;

EPA Victoria, 2006. *Hydrogeological assessment (groundwater quality) guidelines,* Publication 668;

EPA Victoria, 2009. *Sampling and analysis of waters, wastewaters, soils and wastes*, Industrial Waste Resource Guidelines (IWRG701);

Environmental Earth Sciences Pty Ltd, 2009, *Quality Assurance and Environmental Management Manual*;

Environmental Earth Sciences Pty Ltd, 2009. Soil*, gas and groundwater sampling manual*. Work Instruction 01;

Environmental Earth Sciences Pty Ltd, 2008. *Logging manual*. Work Instruction 01;

Environmental Earth Sciences VIC, 2010. *Sampling and Analysis Plan, South Melbourne Gasworks, Albert Park, Victoria*';

Geological Survey of Victoria (GSV), 1974. *Melbourne 1:63 360 Geological Series Map* Part 7822, Zone 55, Sheet SJ 55-1;

GHD 31/26548/189319Letter '*Gasworks Site Environmental Audit Sampling and Analysis Plan,*' dated 10 November 2010;

GHD, 2008. *Section 53V Environmental Audit – Interim Report, Gasworks Site, Albert Park* Report number 31/21452/146576;

Golder Associates, 2004a. *Site History Review, Gasworks Park, Albert Park, Victoria*. Report number 04613504/003;

Golder Associates, 2004b. *Further Recommendations for Action, Gasworks Park, Albert Park.* Letter report number 04613504\504W006L;

Golder Associates, 2004c. Report number 04613504/010 - *Vapour and Edible Vegetation Risk Assessment, Gasworks Park, Albert Park*.

Golder Associates, 2004d. Report number 04613504/025- *Interim Contamination Management Plan for Current Site Use, Gasworks Park, Albert Park*.

Golder Associates, 2004e. *Interim Contamination Management Plan for Current Site Use, Southport Community Nursing Home, Albert Park.* Report number 04613504/026;

Golder Associates, 2006a. *Hydrogeological Conceptual Model, Gasworks Park Precinct, Albert Park.* Report number 05613732/018;

Golder Associates, 2006b. *Assessment of Groundwater Risks, Gasworks Park Precinct, Albert Park.* Report number 05613732/018;

Golder Associates, 2006c. *Installation and Sampling of Additional Groundwater Monitoring Wells, Gasworks Park Precinct, Albert Park.* Report number 05613732/02;

Golder Associates, 2006d. *Review of Contamination Status, Southport Community Residential Home, Albert Park*. Report number 05613732/022;

Golder Associates, 2006e. *Further Groundwater Investigation, North East of the Former South Melbourne Gasworks, Gasworks Park Precinct, Albert Park*. Report number 05613732/039;

Golder Associates, 2007. *Further Groundwater Investigation, Pickles Street Sewer, West of the Former South Melbourne Gasworks, Gasworks Park Precinct, Albert Park.* Report number 05613732/059.

Hem J D and Lind (1974), Kaolinite synthesis at 25°C. Science 184:1171-1173.

Hem J D (1992), *Study and interpretation of the chemical characteristics of natural water*. Third Edition. US Geological Survey Water-Supply Paper 2254.

Leonard, J, 1992. Port *Phillip Region Groundwater Systems - Future Use and Management*. Department of Water Resources.

National Environment Protection Council (NEPC), 1999. *National environment protection (assessment of site contamination) measure*. National Environment Protection Council, Adelaide, SA;

National Health and Medical Research Council (NHMRC)/ Natural Resource Management Ministerial Council (NRMMC) (2011). *Australian drinking water guidelines*. National Water Quality Management Strategy.

NHMRC/ NRMMC (2008). *Guidelines for managing risks in recreational water*. Australian Government, February 2008.

Soil Conservation Authority, 2001. *Flora of Melbourne. Chapter 2 – Soils of Melbourne;*

South East Water. 2004, *Standards for trade waste discharge to the sewerage system;*

Standards Australia (AS 4482.1), 2005. *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*. Standards Australia, Homebush, NSW;

Standards Australia (AS 4482.2), 1999. *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances*. Standards Australia, Homebush, NSW;

Standards Australia (AS/NZS 4801:2001), 2001. *Occupational health and safety management systems - Specification with guidance for use*;

Van de Graaff, R. and Wootton, C, 1996. *Landcare Notes Melbourne Soils.* Department of Sustainability and Environment;

Victorian Government Gazette, 2002. *State Environment Protection Policy (SEPP), Prevention and Management of Contamination of Land*. No. S95, Gazette 4/6/2002;

Victorian Government Gazette, 2002. *SEPP, Groundwaters of Victoria*. No. G12, Gazette 21/3/2002; and

Victorian Government Gazette, 2004. *SEPP, Waters of Victoria (*as varied by Schedule F6 (Waters of the Port Phillip Bay)). No. S101, Gazette 27/8/1997.

13 GLOSSARY OF TERMS

Anisotropy condition in which one or more properties vary according to direction.

Aquifer rock or sediment in a formation, group of formations, or part of a formation which is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Aquifer, confined aquifer that is overlain by a confining bed with significantly lower hydraulic conductivity than the aquifer.

Aquifer, perched region in the unsaturated zone where the soil is locally saturated because it overlies soil or rock of low permeability.

Aquitard a unit of low-permeability that can store groundwater and also transmit it slowly.

Borehole an uncased drill hole.

Bore. A hydraulic structure that facilitates the monitoring of groundwater level, collection of groundwater samples, or the extraction (or injection) of groundwater. Also known as a Well.

Confined Aquifer. An aquifer that is confined between two low-permeability aquitards. The groundwater in these aquifers is usually under hydraulic pressure, i.e. its hydraulic head is above the top of the aquifer.

Confining layer. A layer with low vertical hydraulic conductivity that is stratigraphically adjacent to one or more aquifers. A confining layer is an aquitard. It may lie above or below the aquifer.

Drawdown. Lowering of hydraulic head.

Electrical Conductivity (EC). The EC of water is a measure of its ability to conduct an electric current. This property is related to the ionic content of the sample, which is in turn a function of the total dissolved (ionisable) solids (TDS) concentration. An estimate of TDS in fresh water can be obtained by multiplying EC by 0.65.

Effective Transmissivity. The transmissivity of a bounded aquifer, incorporating the effect of the no-flow boundaries. The effective transmissivity is less than the actual transmissivity in an aquifer of limited extent.

Ephemeral stream a stream that flows only during periods of precipitation and briefly thereafter, or during periods of elevated water-table levels when the stream is in direct hydraulic connection with the underlying unconfined aquifer (i.e. receives base-flow).

Fracture break in the geological formation, e.g. a shear or a fault.

Gradient rate of inclination of a slope. The degree of deviation from the horizontal; also refers to pressure.

Groundwater. The water held in the pores in the ground below the water table.

Hydraulic Head. The sum of the elevation head and the pressure head at a point in an aquifer. This is typically reported as an elevation above a fixed datum, such as sea level.
Hydraulic conductivity. A coefficient describing the rate at which water can move through a permeable medium. It has units of length per time.

Permeability. Property of porous medium relating to its ability to transmit or conduct liquid (usually water) under the influence of a driving force. Where water is the fluid, this is effectively the hydraulic conductivity.

Piezometer a cased borehole with a short slotted screen for measuring standing water level (SWL), which represents a potentiometric surface or elevation of the water table; also used to obtain sample of groundwater for quality assessment.

Piezometric or Potentiometric Surface. A surface that represents the level to which water will rise in cased bores. The water table is the potentiometric surface in an unconfined aquifer.

Purge (wells) pumping out well water to remove drilling debris or impurities; also conducted to bring fresh groundwater into the casing for sample collection. The later ensures that a more representative sample of an aquifer is taken.

Recharge Area location of the replenishment of an aquifer by a natural process such as addition of water at the ground surface, or by an artificial system such as addition through a well

Recovery rate at which a water level in a well rises after pumping ceases.

Saturated Zone zone in which the rock or soil pores are filled (saturated) with water.

Specific yield volume of water released from storage by an unconfined aquifer per unit surface area (of porous medium) per unit decline in the water table. Specific yield is unitless and typically has a value in the range 0.005 to 0.30.

Storativity volume of water released from storage by a confined aquifer per unit surface area (of porous medium) per unit decline in hydraulic head. Storativity is unitless and typically has a value in the range 1E-4 to 0.005.

Stratigraphy vertical sequence of geological units.
Suspended Solids (SS) matter which is suspended in water which will not pass through a 0.45 µm filter membrane.

Total Dissolved Solids or Total Dissolved Salts (TDS) total dissolved salts comprise dissociated compounds and undissociated compounds, but not suspended material, colloids or dissolved gases.

Transmissivity rate at which water is transmitted through a unit width aquifer under a unit hydraulic gradient.

Unconfined aquifer. An aquifer in which the water table forms the upper boundary.

Unsaturated zone. The zone between the land surface and the water table, in which the rock or soil pores contain both air and water.

Water table interface between the saturated zone and unsaturated zones. The surface in an aquifer at which pore water pressure is equal to atmospheric pressure.

Well. A hydraulic structure that facilitates the monitoring of groundwater level, collection of groundwater samples, or the extraction (or injection) of groundwater. Also known as a Bore.

ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences VIC. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered onsite. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

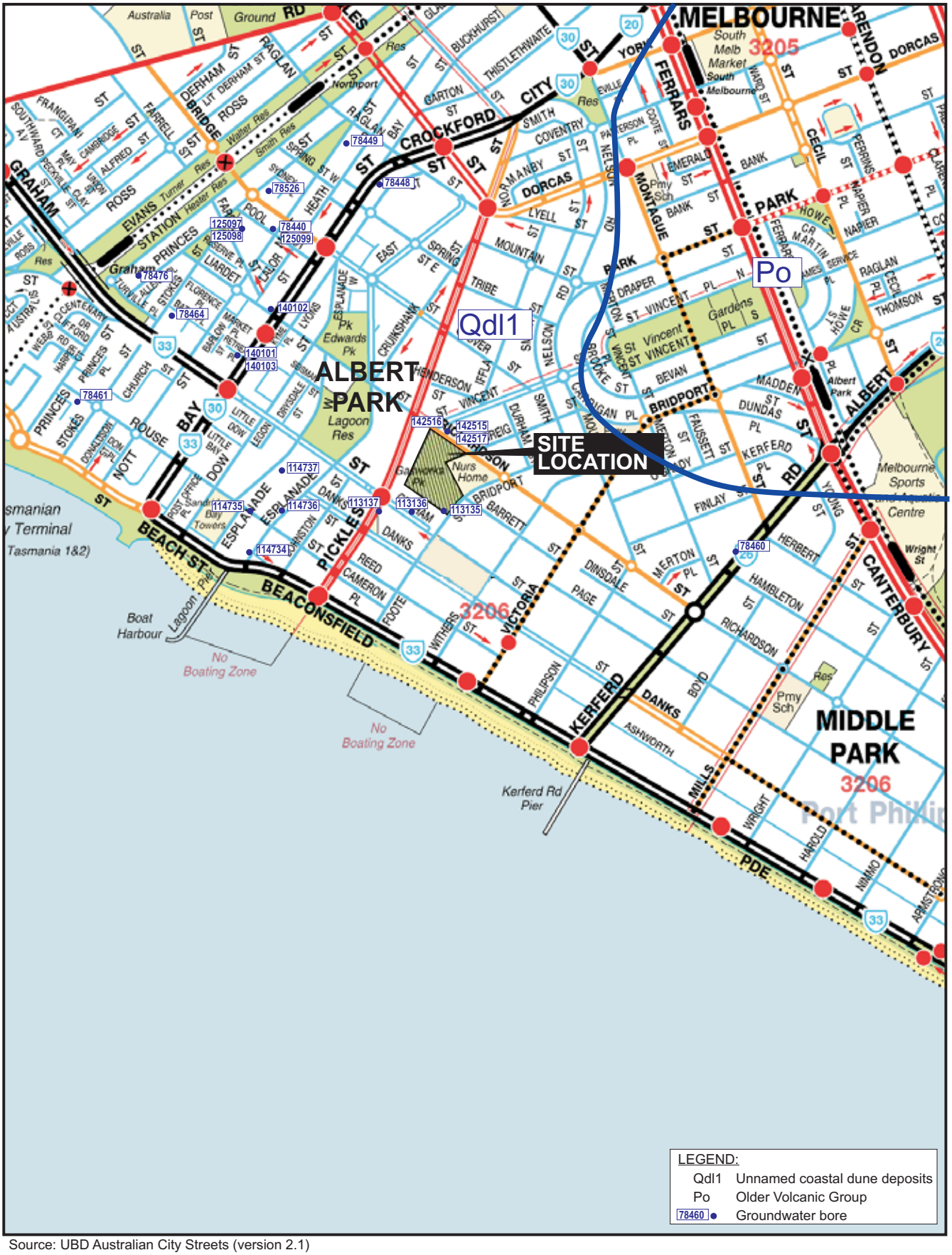
The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

Limit of liability

This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences VIC disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences VIC disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences VIC's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES



Source: UBD Australian City Streets (version 2.1)
(page 283, B8)
E 319317 N 5809245

0 500
Scale in Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Locality Map**		
Location:	**21 Graham Street Albert Park, Vic.**		
Client:	**City of Port Phillip**	Job No:	**210074**
Project Man:	**DJ**	Scale:	**As shown**
Drawn By:	**LB**	Date:	**August 2011**
		Figure	**1**

0 20 40 60 80 100
Scale in Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title: **South Melbourne Gasworks - Current Site Layout**

Location: **21 Graham Street Albert Park, Vic.**

Client: **City of Port Phillip**		Job No: **210074**
Project Man: **DJ**	Scale: **As shown**	Figure **2**
Drawn By: **LB**	Date: **August 2011**	

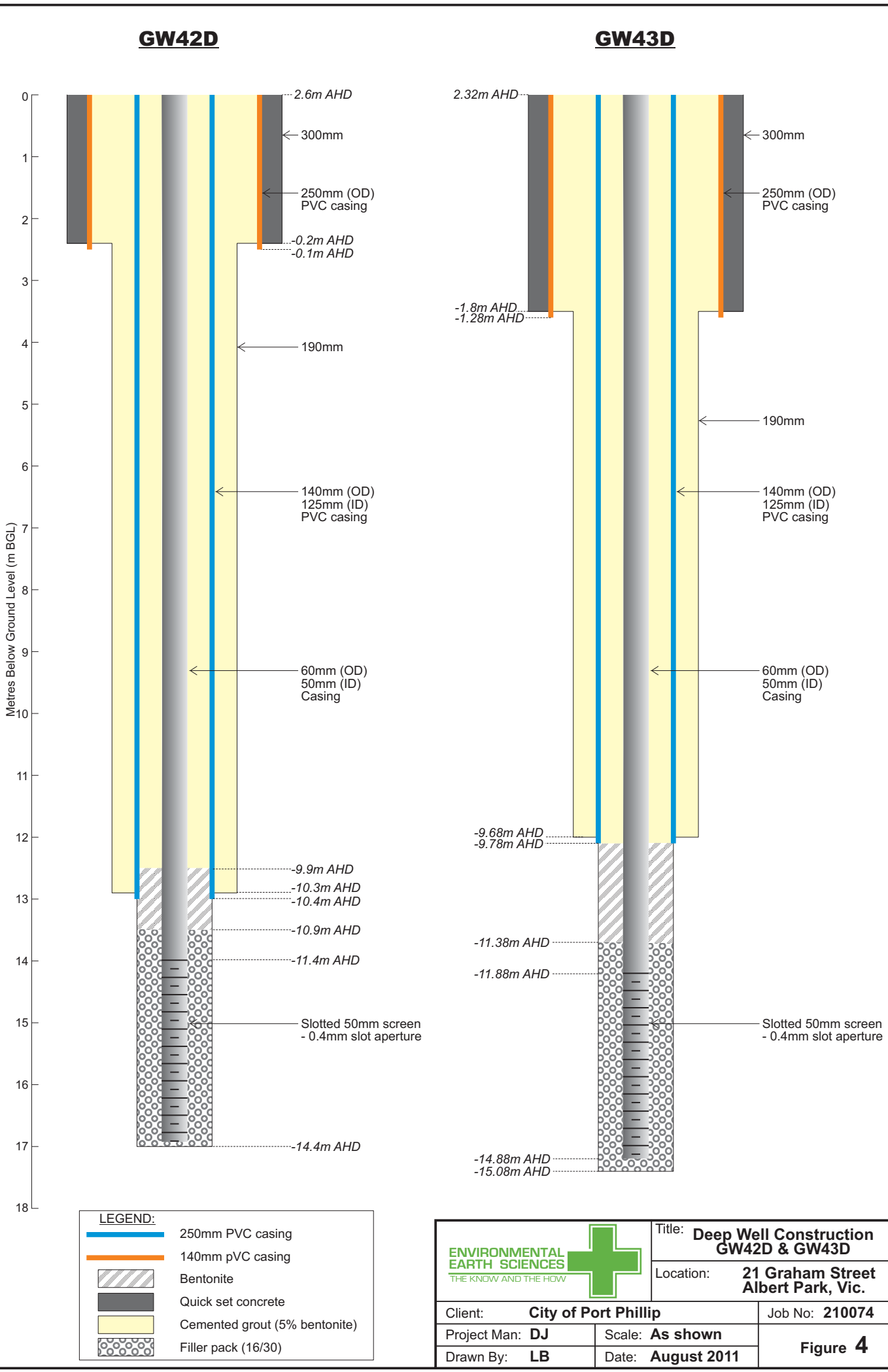
Legend

- SiteBoundary
- U Well Locations Prior Works
- U Well Locations EES (2011)

0 25 50 100 Meters

ENVIRONMENTAL EARTH SCIENCES

Title: **Groundwater well locations**		
Location: **South Melbourne Gasworks**		
Client: **City of Port Phillip**		Job number: **210074**
Drawn by: **PF**	Scale: **As Shown**	Source:
Proj Man: **DJ**	Date: **Aug 2010**	**Figure 3**

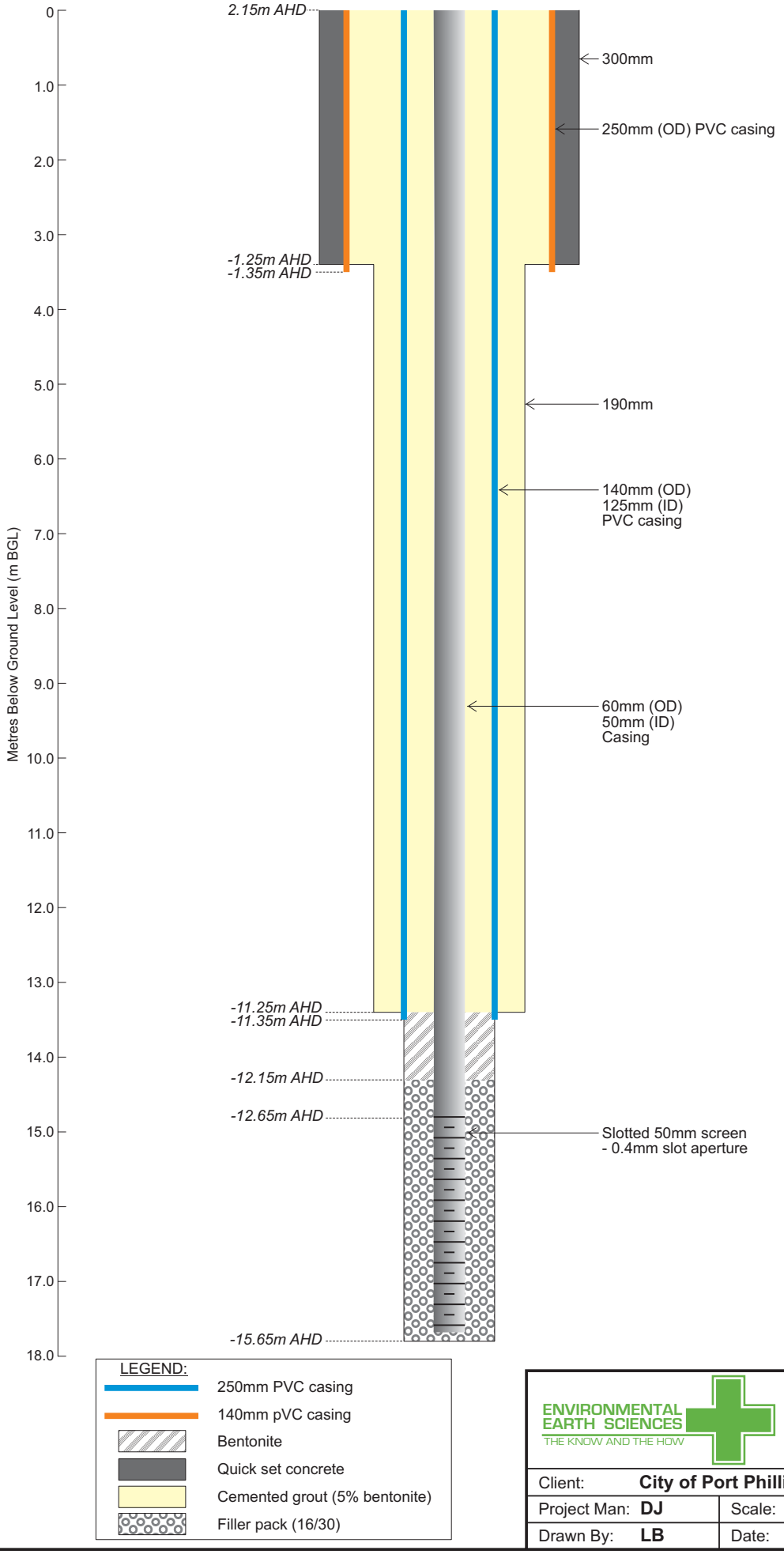


ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Deep Well Construction GW42D & GW43D**
Location:	**21 Graham Street Albert Park, Vic.**
Client:	**City of Port Phillip**
Job No:	**210074**
Project Man:	**DJ**
Scale:	**As shown**
Drawn By:	**LB**
Date:	**August 2011**

Figure 4

GW44D



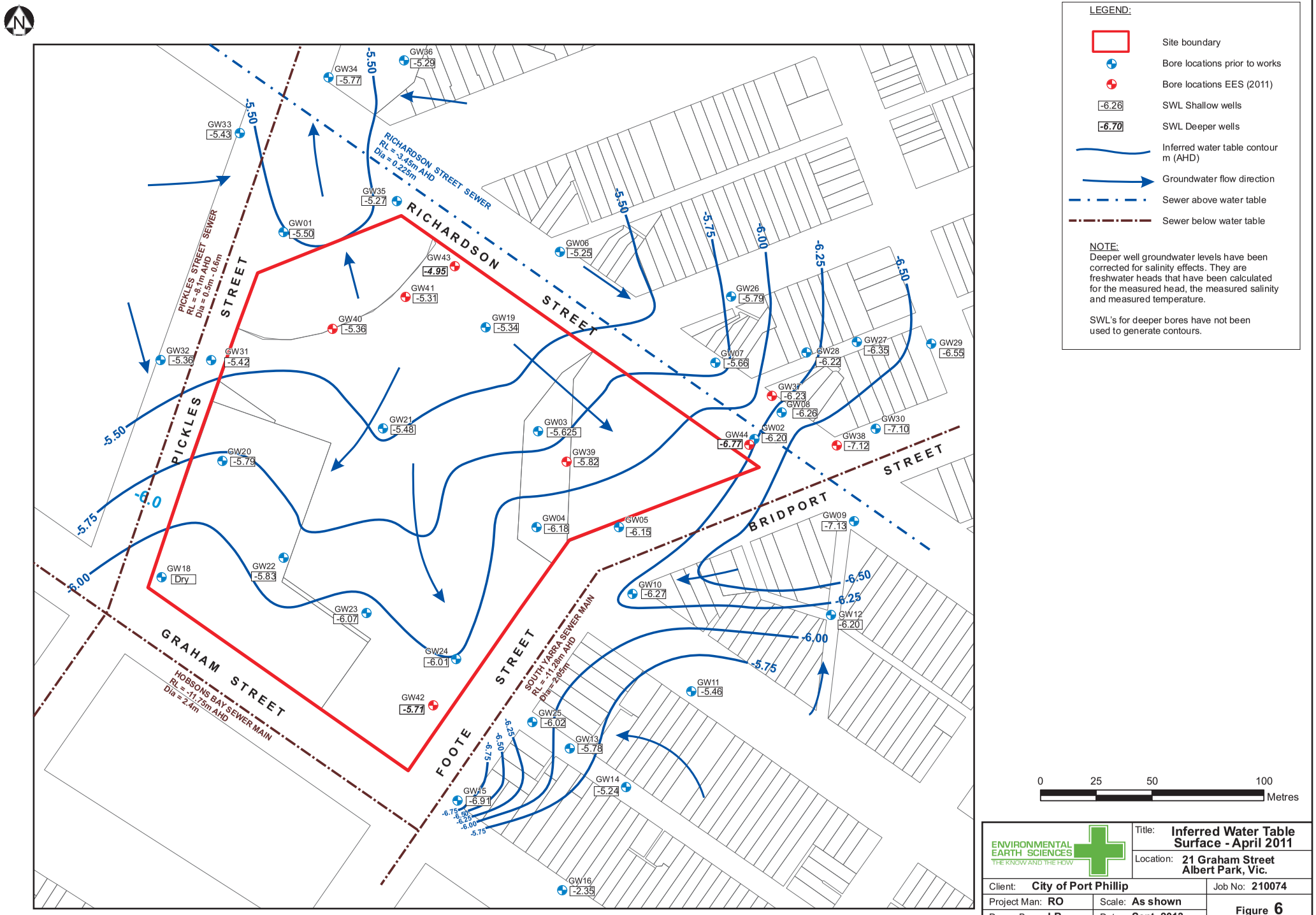
LEGEND:

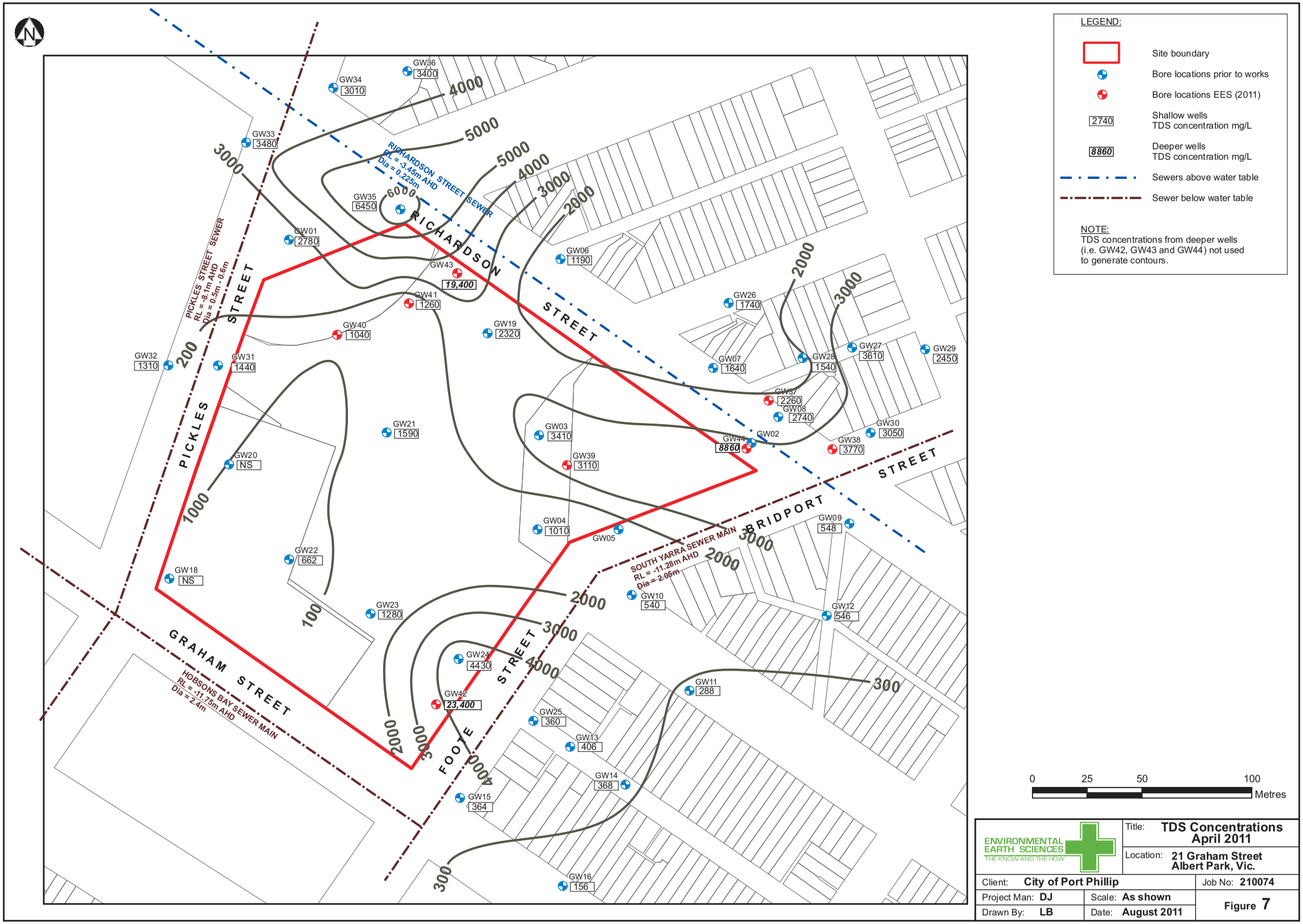
- 250mm PVC casing
- 140mm pVC casing
- Bentonite
- Quick set concrete
- Cemented grout (5% bentonite)
- Filler pack (16/30)

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Deep Well Construction GW44D**
Location:	**21 Graham Street Albert Park, Vic.**
Client:	**City of Port Phillip**
Job No:	**210074**
Project Man:	**DJ**
Scale:	**As shown**
Drawn By:	**LB**
Date:	**August 2011**

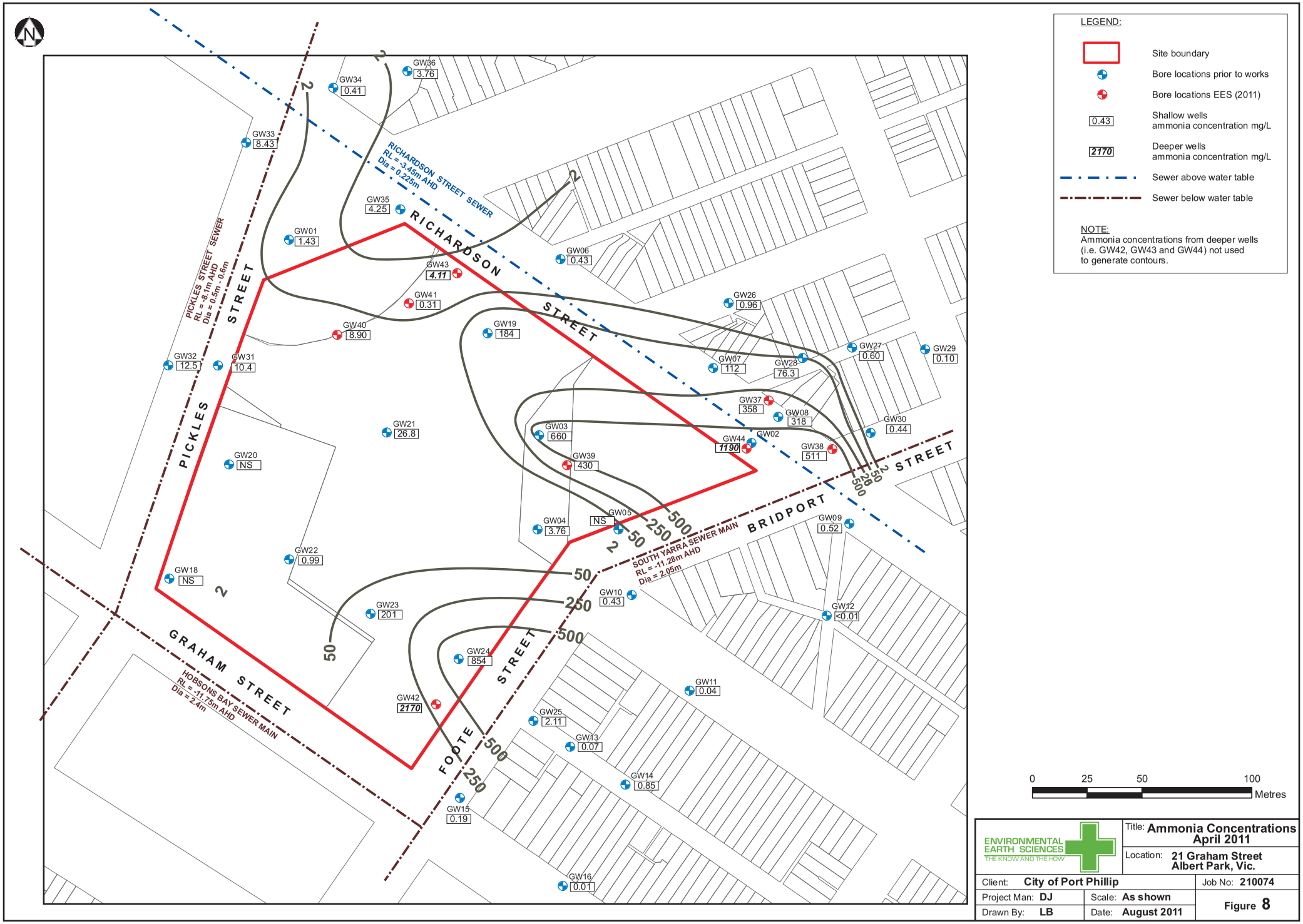
Figure 5


LEGEND:
Site boundary
Bore locations prior to works
Bore locations EES (2011)
-6.26 SWL Shallow wells
-6.70 SWL Deeper wells
Inferred water table contour m (AHD)
Groundwater flow direction
Sewer above water table
Sewer below water table
NOTE:
Deeper well groundwater levels have been corrected for salinity effects. They are freshwater heads that have been calculated for the measured head, the measured salinity and measured temperature.
SWL's for deeper bores have not been used to generate contours.
RICHARDSON STREET
PICKLES STREET
BRIDPORT STREET
GRAHAM STREET
FOOTE STREET
RICHARDSON STREET SEWER RL = -3.45m AHD Dia = 0.225m
PICKLES STREET SEWER RL = -8.1m AHD Dia = 0.5m - 0.6m
SOUTH YARRA SEWER MAIN RL = -11.28m AHD Dia = 2.05m
HOBSONS BAY SEWER MAIN RL = -11.75m AHD Dia = 2.4m
GW01 -5.50
GW02 -6.20
GW03 -5.625
GW04 -6.18
GW05 -6.15
GW06 -5.25
GW07 -5.66
GW08 -6.26
GW09 -7.13
GW10 -6.27
GW11 -5.46
GW12 -6.20
GW13 -5.78
GW14 -5.24
GW15 -6.91
GW16 -2.35
GW18 Dry
GW19 -5.34
GW20 -5.79
GW21 -5.48
GW22 -5.83
GW23 -6.07
GW24 -6.01
GW25 -6.02
GW26 -5.79
GW27 -6.35
GW28 -6.22
GW29 -6.55
GW30 -7.10
GW31 -5.42
GW32 -5.36
GW33 -5.43
GW34 -5.77
GW35 -5.27
GW36 -5.29
GW37 -6.23
GW38 -7.12
GW39 -5.82
GW40 -5.36
GW41 -5.31
GW42 -5.71
GW43 -4.95
GW44 -6.77
0 25 50 100 Metres
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW
Title: Inferred Water Table Surface - April 2011
Location: 21 Graham Street Albert Park, Vic.
Client: City of Port Phillip
Job No: 210074
Project Man: RO
Scale: As shown
Drawn By: LB
Date: Sept. 2013
Figure 6



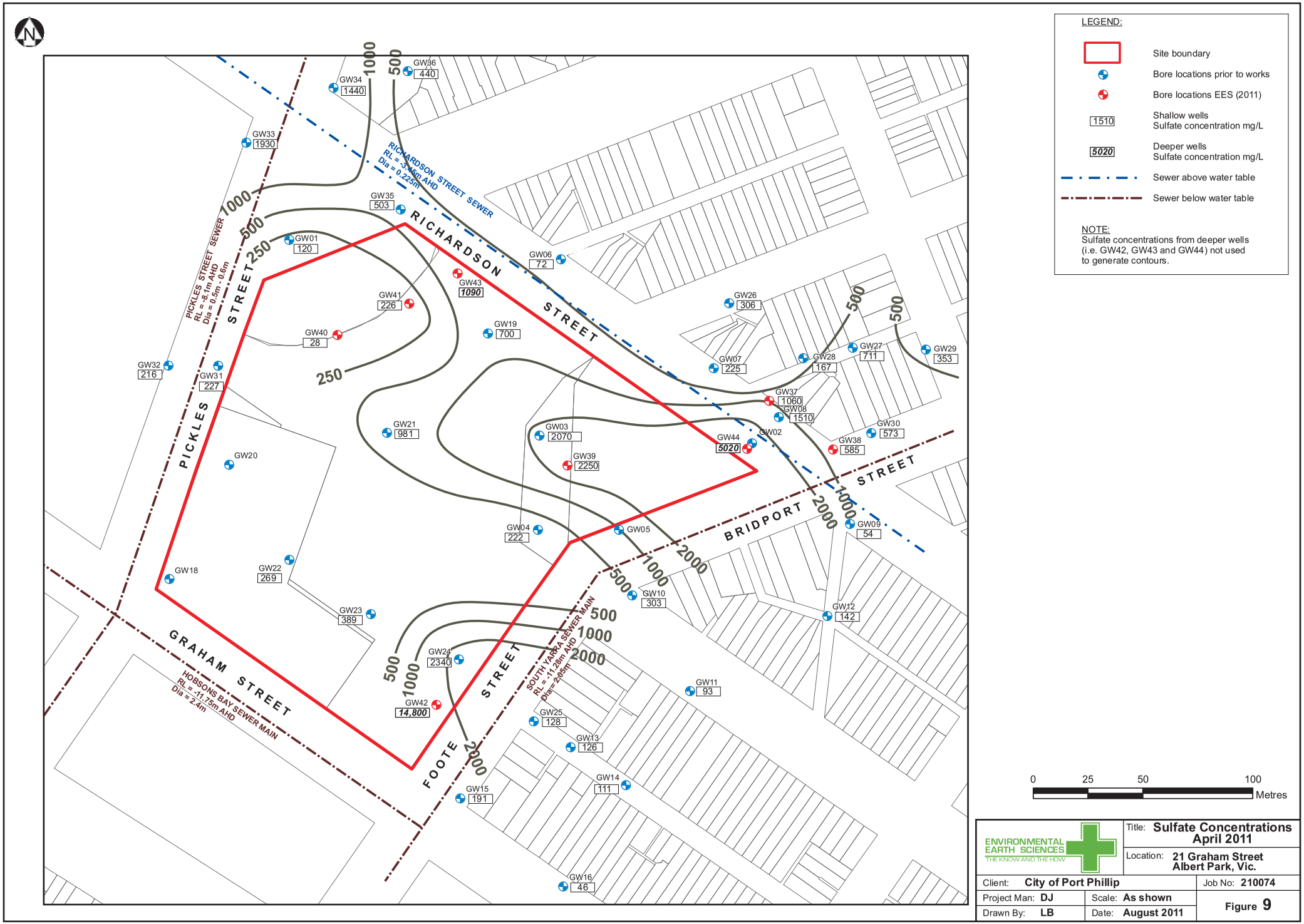
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**TDS Concentrations April 2011**		
Location:	**21 Graham Street Albert Park, Vic.**		
Client:	**City of Port Phillip**		Job No: **210074**
Project Man: **DJ**		Scale: **As shown**	**Figure 7**
Drawn By: **LB**		Date: **August 2011**	



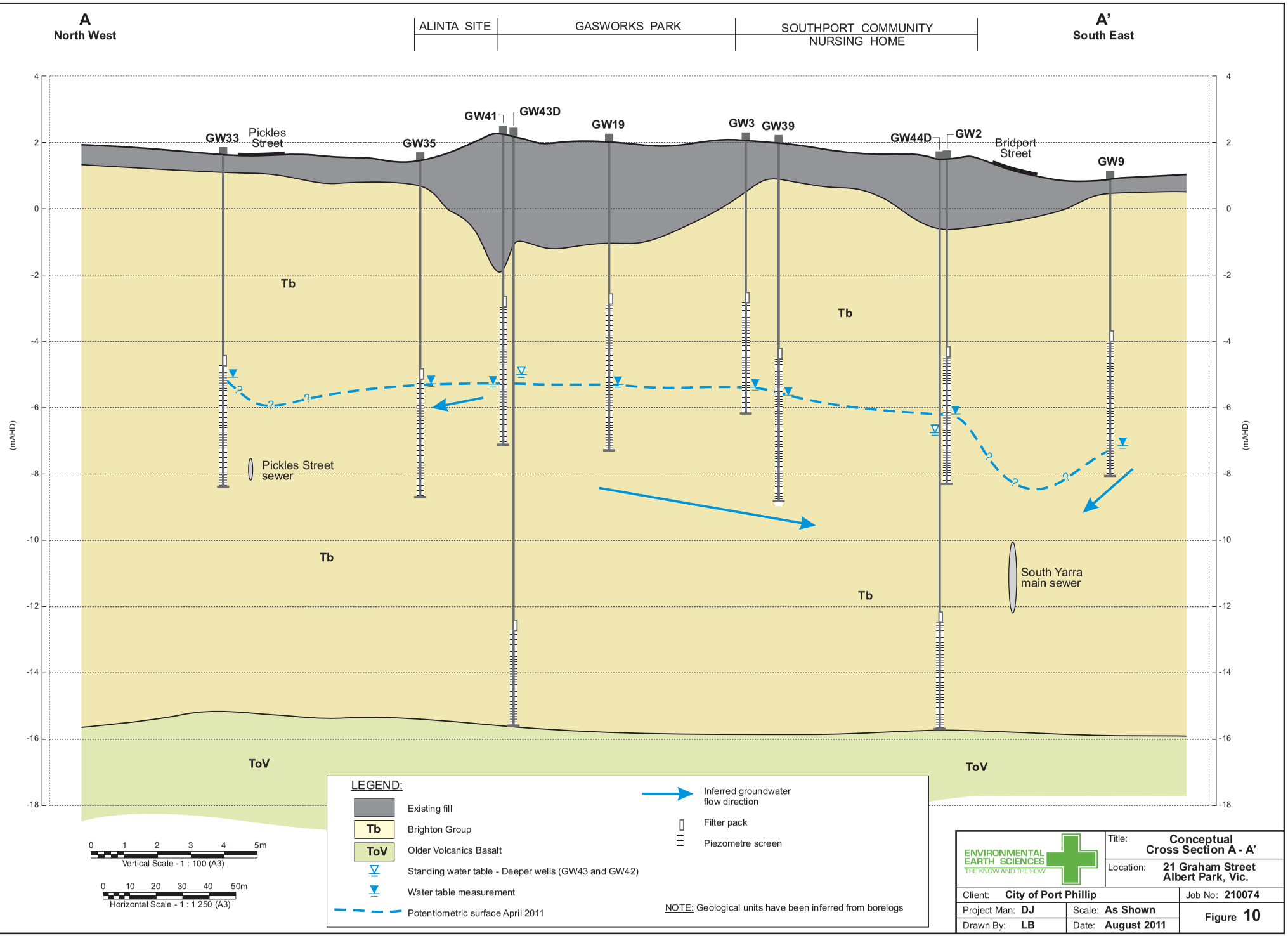
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

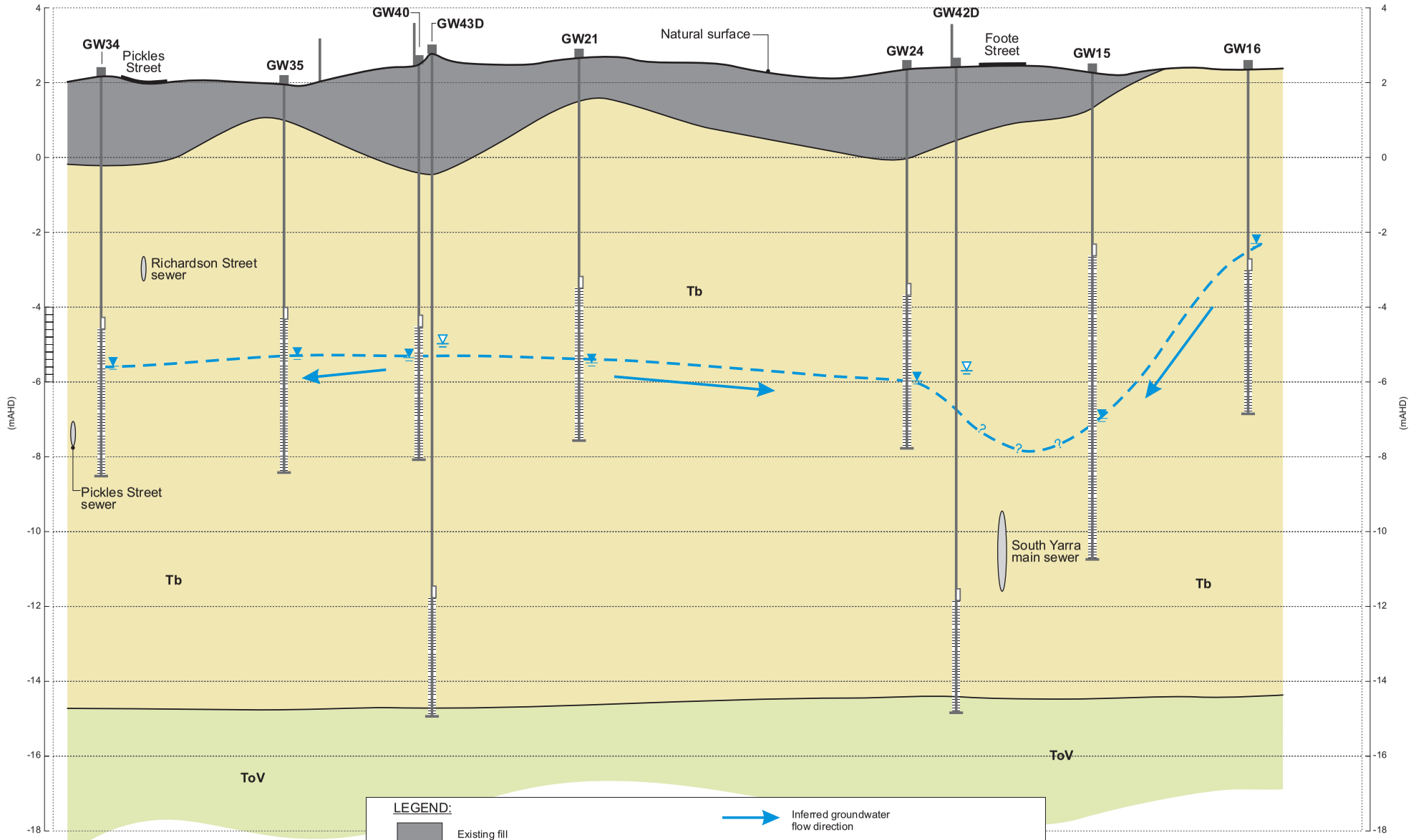
Title: **Ammonia Concentrations April 2011**		
Location: **21 Graham Street Albert Park, Vic.**		
Client: **City of Port Phillip**		Job No: **210074**
Project Man: **DJ**	Scale: **As shown**	**Figure 8**
Drawn By: **LB**	Date: **August 2011**	



ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Sulfate Concentrations April 2011**		
Location:	**21 Graham Street Albert Park, Vic.**		
Client:	**City of Port Phillip**		Job No: **210074**
Project Man:	**DJ**	Scale: **As shown**	**Figure 9**
Drawn By:	**LB**	Date: **August 2011**	


A
North West
ALINTA SITE
GASWORKS PARK
SOUTHPORT COMMUNITY NURSING HOME
A'
South East
GW33
Pickles Street
GW35
GW41
GW43D
GW19
GW3
GW39
GW44D
GW2
Bridport Street
GW9
Tb
Tb
Tb
Tb
ToV
ToV
Pickles Street sewer
South Yarra main sewer
(mAHD)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
LEGEND:
Existing fill
Tb
Brighton Group
ToV
Older Volcanics Basalt
Standing water table - Deeper wells (GW43 and GW42)
Water table measurement
Potentiometric surface April 2011
Inferred groundwater flow direction
Filter pack
Piezometre screen
NOTE: Geological units have been inferred from borelogs
0 1 2 3 4 5m
Vertical Scale - 1 : 100 (A3)
0 10 20 30 40 50m
Horizontal Scale - 1 : 1 250 (A3)
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW
Title: Conceptual Cross Section A - A'
Location: 21 Graham Street Albert Park, Vic.
Client: City of Port Phillip
Job No: 210074
Project Man: DJ
Scale: As Shown
Drawn By: LB
Date: August 2011
Figure 10



LEGEND:

- Existing fill
- Tb — Brighton Group
- ToV — Older Volcanics Basalt
- Standing water table - Deeper wells (GW43 and GW42)
- Water table measurement
- Potentiometric surface April 2011
- Inferred groundwater flow direction
- Filter pack
- Piezometre screen

NOTE: Geological units have been inferred from borelogs

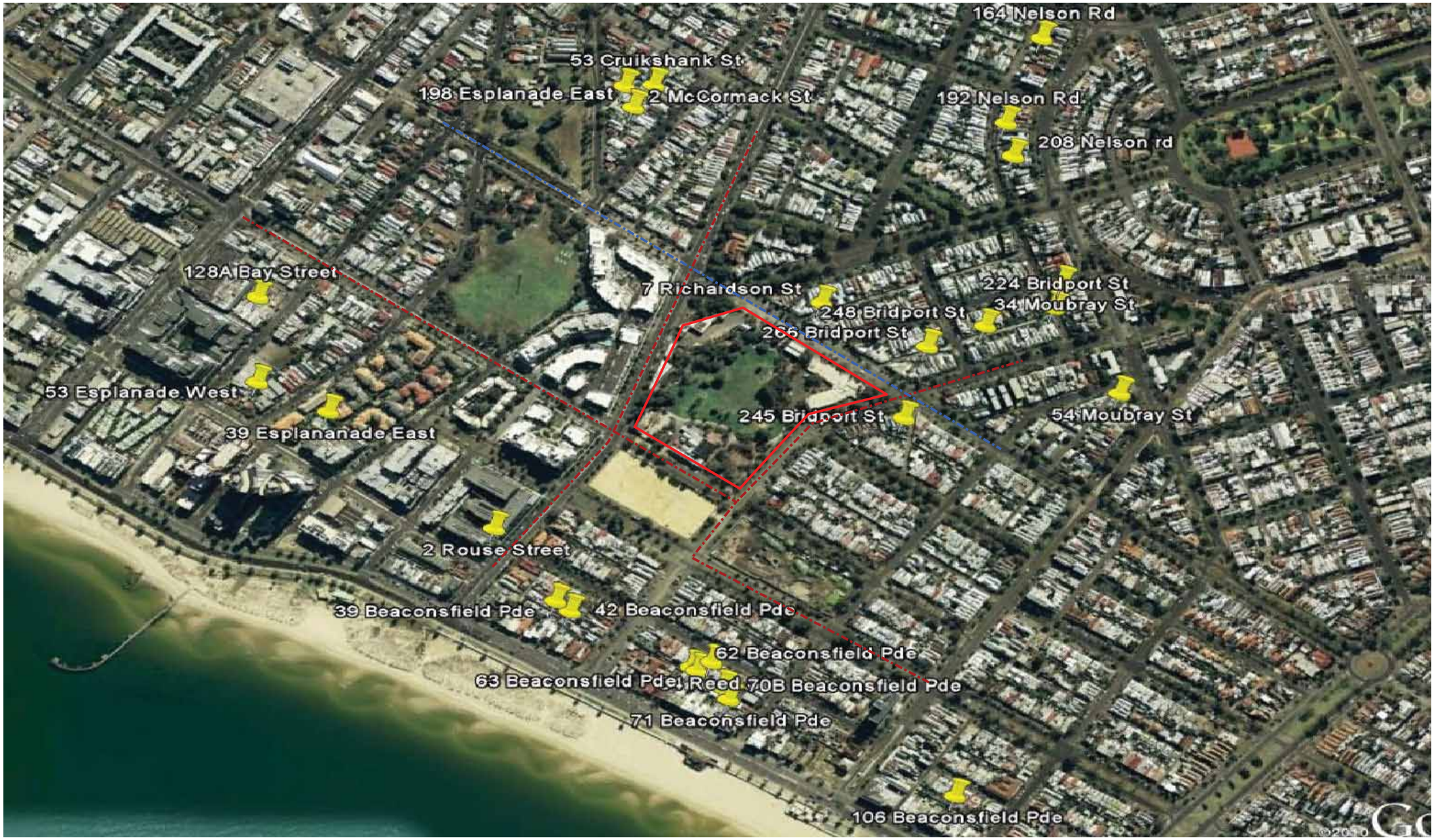
0 1 2 3 4 5m
Vertical Scale - 1 : 100 (A3)

0 10 20 30 40 50m
Horizontal Scale - 1 : 1 250 (A3)

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	Conceptual Cross Section B - B'
Location:	21 Graham Street Albert Park, Vic.
Client: City of Port Phillip	Job No: 210074
Project Man: DJ	Scale: As Shown
Drawn By: LB	Date: August 2011

Figure 11



Legend

- Site Boundary
- Sewer above water table
- Sewer below water table

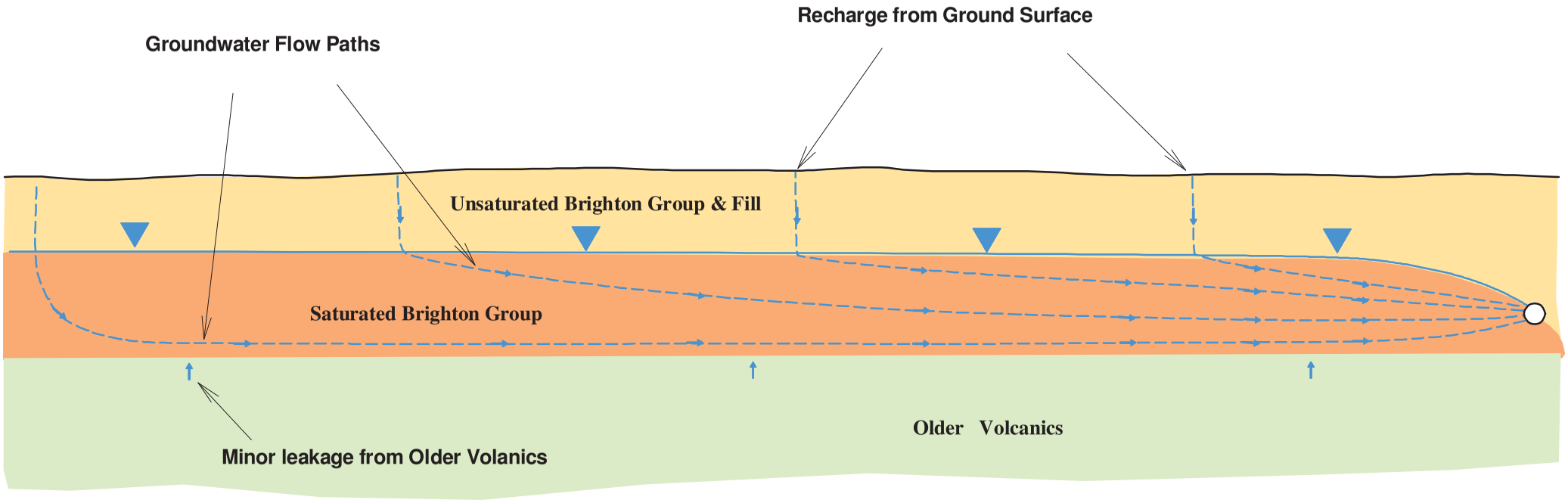
0 75 150 300 Metres

ENVIRONMENTAL EARTH SCIENCES	Title: **Swimming pools near the site**	
	Location: **South Melbourne Gasworks**	
Client: **City of Port Phillip**		Job number: **210074**
Drawn by: **PF**	Scale: **As Shown**	Source: **Google Earth**
Proj Man: **DJ**	Date: **July 2010**	**Figure 12**

Conceptualisation of On-Site Groundwater Flow System

North Central Part of Site

Site Perimeter at Foote St. (or Graham St.)



0 5 10 15 20 25 Metres

Horiz. Scale

Scale 1cm = 5m (1:500) approximately - Note: no vertical exaggeration.

ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW	Title: Conceptualisation of On-Site Groundwater Flow System	
	Location: 21 Graham Street, Albert Park, Vic.	
Client: City of Port Phillip		Job number: 210074
Drawn by: TRJ	Scale: As shown	Figure 13
Proj Man: ST	Date: October 2012	

TABLES

TABLE 1 SEPP *GOV* GROUNDWATER BENEFICIAL USES

Beneficial Uses	Segments (mg/L TDS)				
	A1 (0-500)	A2 (501-1000)	B (1001-3500)	C (3501-13000)	D (>13000)
1. Maintenance of ecosystems	✓	✓	✓	✓	✓
2. Potable Water supply:					
Desirable	✓				
Acceptable		✓			
3. Potable mineral water supply	✓	✓	✓		
4. Agriculture, parks & gardens	✓	✓	✓		
5. Stock watering	✓	✓	✓	✓	
6. Industrial water use	✓	✓	✓	✓	✓
7. Primary contact recreation (e.g. bathing, swimming)	✓	✓	✓	✓	✓
8. Buildings and structures	✓	✓	✓	✓	✓

TABLE 2 GROUNDWATER WELL CLASSIFICATION (SEPP *GOV*)

SEPP Segment	Groundwater wells
Segment A_1 (TDS 0 - 500 mg/L)	GW11, GW13, GW14, GW15, GW16 and GW25
Segment A_2 (TDS 501 - 1,000 mg/L)	GW9 GW12, GW10, and GW22
Segment B (TDS 1,001 – 3,500 mg/L)	GW1, GW3, GW4, GW6, GW7, GW8, GW19, GW21, GW26, GW28, GW29, GW30, GW31, GW32, GW33, GW34, GW36, GW37, GW39, GW40 and GW41
Segment C (TDS 3,501 – 13,000 mg/L)	GW35, GW24, GW38 and GW44
Segment D (TDS > 13,000 mg/L)	GW43 and GW42

TABLE 3 REGISTERED GROUNDWATER WELLS WITHIN A 3 KM RADIUS OF THE SOUTH MELBOURNE GASWORKS

Distance from site	Distance from site (m)	Number of wells	Use	Depth range (m)	Lithology	SWL (metres below ground level (m BGL))	Yield (L/sec)	EC
0 km – 1 km	115 – 970	21	unknown	4 – 150	Sand[b]	1.9[a]	0.8[a]	-
	66 – 832	16	investigation	4 – 10	Sand, silt, clay	-	-	-
	443 – 970	9	stock and/or domestic	3.91 – 32	Sand, basalt (> 17m)[a]	2 - 8	0.2 – 5.8	-
	844 – 889	3	irrigation	6 – 6.1	-	-	-	-
1 km – 2 km	1,182 – 1,911	13	stock and/or domestic	3 – 15	Sand and marl[a]	1.6 - 3	0.4 – 1.1	330[a]
	1,387 – 1,432	24	investigation	6	-	-	-	-
	1,001 – 1,909	20	unknown/other	14 – 52	Sand, basalt[b]	1.7[a]	0.7[a]	-
	1,078 – 1,972	52	investigation	2.5 – 20	Sand, silt	0.6 – 2.8	-	-
2 km – 3 km	2,065 – 2,982	8	stock and/or domestic	4 – 10	-	-	-	-
	2,052 – 2,938	64	investigation	4 – 36	Clay, silt	2 – 3.4	-	-
	2,031 – 2,983	59	unknown/other	5 – 85	Sand, silt, clay, sandstone[a]	2 – 4.8	0.6[a]	-

Notes:

1. - = no data available.
2. [a] = information only available for one well in this field.
3. [b] = information only available for two wells in this field.

TABLE 4 SUMMARY OF EXISTING GROUNDWATER MONITORING WELLS

Location	Groundwater Monitoring Wells (GW)
OS Wells	1, 2*, 3, 4, 5*, 18*, 19, 20*, 21, 22, 23, 24, 31, 35, 39, 40, 41, 42D, 43D and 44D
NW Wells	6, 32, 33, 34 and 36
NE Wells	7, 8, 26, 27, 28, 29, 30, 37 and 38
SE Wells	9, 10, 11, 12, 13, 14, 15, 16 and 25

Notes:
1. *not included in the April 2011 sampling.
2. D indicates wells are "deep" and installed at the base of the aquifer hydrogeological unit (Brighton Group Sediments).

TABLE 5 NEW GROUNDWATER WELL LOCATIONS AND RATIONALE

Groundwater well ID	Approx well depth (m BGL)	Screen depth (m BGL)	Rationale
GW37	10	7 - 10	Assess potential offsite impact to residential areas east of Southport Community Nursing Home.
GW38	10	7 - 10	Assess potential offsite impact to residential areas east of Southport Community Nursing Home.
GW39	10	7 - 10	Potential source of groundwater pollution (i.e. liquor tank, purifiers and tar tank).
GW40	10	7 - 10	Potential source of groundwater pollution from Gasworks Park offsite to the Alinta site (i.e. north).
GW41	10	7 - 10	Potential source of groundwater pollution from Gasworks Park offsite to the Alinta site (i.e. north).
GW42D	18	15 - 18	Assess potential for DNAPL in the vicinity of the former tar tank and further investigate the MAH and PAH concentrations identified in GW24.
GW43D	18	15 - 18	Up-gradient investigation of deep groundwater quality. This deeper well was intended to investigate background conditions.
GW44D	18	15 - 18	Deeper groundwater investigation (potential NAPL) offsite.

Note: Refer to Figure 3 for groundwater well locations.

TABLE 6 GROUNDWATER WELL INSTALLATION DETAILS

Well ID	Groundwater Well Construction License No.	Date installed	Easting (m AMG 66)	Northing (m AMG 66)	Level of top of well casing (PVC) (mAHD)	Level of gatic cover (ground surface) (mAHD)	Well screen interval (m)	Construction details
GW37	WLE049168	1/03/2011	319 529.2	5 809 703.9	1.892	1.957	7-11 m	S – 6.5-11.0 m B – 5.5-6.5 m G – 0-5.5 m
GW38	WLE049168	28/02/2011	319 558.0	5 809 681.8	1.874	1.968	6-10 m	S – 5.5-10.0 m B – 4.5-5.5 m G – 0-4.5 m
GW39	WLE049168	1/03/2011	319 437.0	5 809 674.5	2.331	2.414	7-11.5 m	S – 6.5-11.5 m B – 5.5-6.5 m G – 0-5.5 m
GW40	WLE049168	28/02/2011	319 332.3	5 809 734.2	2.149	2.317	6.5-10.5 m	S – 5.5-10.5 m B – 4.5-5.5 m G – 0-4.5 m
GW41	WLE049168	28/02/2011	319 364.8	5 809 748.0	2.485	2.583	6.0-10.0 m	S – 5.5-10.0 m B – 4.5-5.5 m G – 0-4.5 m
GW42D	WLE049168	3/03/2011	319 377.1	5 809 565.2	2.518	2.609	14.0-17.0 m	S – 13.5-17.0 m B – 13.0-13.5 m G – 0-13.0 m
GW43D	WLE049168	1/03/2011	319 386.6	5 809 761.7	2.262	2.320	14.2-17.2 m	S – 13.7-17.2 m B – 13.2-13.7 m G – 0-13.2 m
GW44D	WLE049168	2/03/2011	319 519.2	5 809 682.4	2.070	2.149	14.8-17.8 m	S – 14.2-17.8 m B – 13.4-14.2 m 0-13.4 m

Notes:

1. S = Sand.
2. B = Bentonite.
3. G = Grout.
4. see Figures 4 and 5 for further detail regarding deeper well construction.

TABLE 7 GROUNDWATER WELL DEVELOPMENT DETAILS

Well ID	Development date	Development method	Total depth (mbgs)	Initial Depth to Water (mbgl)	Volume purged (L)	Odour	Colour	Comments
GW1	21/03/11	Bailer	9.00	7.37	40	none	cloudy brown	good recharge, became clear
GW2	22/03/11	Bailer	8.48	8.10	8 (left to recharge after 4 L)	very strong PAH	blackish grey	very slow recharge. Purged dry twice
GW3	22/03/11	Bailer	9.58	8.95	6	strong PAH	greyish brown	very slow recharge
GW4	22/03/11	Bailer	8.73	8.13	2	slight PAH	brown	very slow recharge
GW5	21/03/11	Bailer	8.77	8.00	4	strong PAH	yellow	very slow recharge
GW6	22/03/11	SP	9.53	6.22	30	none	yellow/brown	good recharge, became clear
GW7*	-	-	-	-	-	-	-	-
GW8	13/04/11	Bailer	9.40	7.97	20	slight hydrocarbon	cloudy	initially thick with sediment, became clear during purging
GW9	21/03/11	Bailer	9.98	8.77	10	none	yellow/brown	dome sediment, slow recharge
GW10	21/03/11	SP	10.07	8.09	20	slight PAH initially	yellow/brown	fine sediment and small rootlets removed
GW11	21/03/11	SP	8.97	7.19	20	none	yellow/brown	purged dry
GW12	21/03/11	SP	10.00	7.70	20	none	clear	good recharge
GW13	21/03/11	Bailer	9.22	7.51	30	none	bright yellow	initially thick with sediment then became clear
GW14	21/03/11	SP	9.22	7.20	30	none	red to clear	good recharge, became clear during purging
GW15	21/03/11	SP	11.45	9.00	30	none	red to clear	good recharge, became clear during purging
GW16	21/03/11	SP	9.00	4.77	30	none	clear	good recharge
GW18	Dry	-	-	-	-	-	-	-
GW19	13/04/11	Bailer	-	7.65	20	slight odour	yellow	initially high in sediment, became clear during purging
GW20	13/04/11	Dry	-	-	-	-	-	-
GW21	13/04/11	Bailer	-	8.01	20	slight PAH	clear	good recharge
GW22	13/04/11	Bailer	-	8.16	15	slight PAH	cloudy	fair recharge
GW23	13/04/11	Bailer	-	8.78	15	slight PAH	cloudy	purged dry twice
GW24	13/04/11	Bailer	9.99	8.89	15	sweet (phenol)	cloudy	bailed dry twice
GW25	21/03/11	SP	10.10	7.91	25	none	yellow	became yellow clear during purging
GW27	21/03/11	SP	10.24	8.12	60	none	clear	good recharge
GW28	21/03/11	SP	10.24	7.82	60	none	light brown to clear	good recharge
GW29	13/04/11	Bailer	11.57	8.49	20	none	clear	some rootlets present
GW30	22/03/11	SP	10.50	8.86	30	none	clear	good recharge
GW31	22/03/11	SP	10.50	7.06	25	slight PAH	brown/yellow	good recharge
GW32*	-	-	-	-	-	-	-	-
GW33	22/03/11	SP	10.26	7.20	30	slight PAH	brown/yellow	good recharge
GW34	22/03/11	SP	10.27	7.70	20	slight PAH	brown/yellow	purged dry twice
GW35	22/03/11	SP	10.25	6.81	25	slight PAH	yellow	fair recharge, became clearer during purging
GW36	21/03/11	SP	10.26	7.11	60	none	cloudy	good recharge
GW37	21/03/11	SP	9.50	7.99	60	hydrocarbon	grey	slow recharge
GW38	22/03/11	Bailer	10.00	8.95	10 (left to recharge after 5 L)	strong PAH	blackish grey	very slow recharge. Purged dry twice
GW39	22/03/11	Bailer/SP	9.78	8.15	10	strong PAH	blackish grey	slow recharge
GW40	21/03/11	SP	10.44	7.50	60	none	cloudy brown	very silty initially
GW41	21/03/11	Bailer	10.00	7.73	50	none	cloudy brown	good recharge
GW42D	21/03/11	Bailer	17.00	9.47	45	PAH	yellow/brown	bubbles noted in purged water
	13/04/11	Bailer	-	-	40	PAH	clear	good recharge
GW43D	13/04/11	Bailer	17.10	7.37	55	none	Clear	good recharge
GW44D	13/04/11	Bailer	17.76	8.87	60	strong PAH	Purple	good recharge, impacted groundwater

Notes:

1. SP = submersible pump.
2. * = existing wells unable to be developed due to access constraints. Wells were purged dry and left to recharge prior to sampling.

TABLE 8 FIELD GROUNDWATER PARAMETER MEASUREMENTS

Groundwater Well	Depth		Screen length	Screen interval		pH	EC	Eh	pe	DO	Temp	Odour	Colour
				Top	Bottom								
Units	mBGS	mAHD	m	mAHD		-	µS/cm	mV	-	ppm	°C	-	-
GW1	---	-7.92	---	---	---	7.17	4816	74	1.25	1.86	21.2	none	light brown
GW3	10.00	---	---	---	-7.920	6.6	5550	-73	-1.23	1.18	18.6	mild HC	light brown
GW4	---	---	---	---	---	7.11	930	185	3.13	3.38	18.6	-	light brown
GW5	10.00	-7.89	---	---	---	-	-	-	0.00	-	-	-	-
GW6	10.00	-8.38	4.5	-3.88	-8.38	6.97	1945	93	1.57	3.39	20.0	earthy	cloudy brown
GW7	10.00	-8.17	4.5	-3.67	-8.17	6.52	2510	482	8.14	0.18	21.8	none	light brown
GW8	10.00	-8.17	4	-4.17	-8.17	6.27	4000	-61	-1.03	0.2	19.2	none	cloudy brown
GW9	10.00	-8.14	4	-4.14	-8.14	6.65	781	74	1.25	3.91	20.8	mild HC	cloudy brown
GW10	10.00	-8.01	4	-4.51	-8.51	5.23	930	228	3.85	2.57	18.7	none	light yellow
GW11	9.00	-7.15	4	-3.15	-7.15	5.55	471	268	4.53	4.52	18.6	mild HC	turbid yellow/white-milky
GW12	10.00	-8.28	4	-4.28	-8.28	6.91	587	94	1.59	3.88	19.1	slight HC	clear
GW13	10.00	-8.09	4	-4.09	-8.09	6.25	540	134	2.26	5.07	19.3	none	turbid yellow/brown
GW14	10.00	-7.95	4	-3.95	-7.95	6.67	546	42	0.71	1.99	19.4	none	turbid yellow/brown
GW15	13.00	-10.69	8	-2.69	-10.69	6.11	553	197	3.33	2.07	18.1	none	Cloudy orange/brown
GW16	9.00	-6.43	4	-2.43	-6.43	7.2	242	42	0.71	2.01	19.4	none	turbid yellow/grey
GW18	10.00	-7.47	4	-3.47	-7.47	-	-	-	-	-	-	-	-
GW19	10.00	-7.59	4	-3.59	-7.59	5.43	3760	50	0.84	0.28	17.0	mild NAP	light yellow
GW20	10.00	-7.80	4	-3.80	-7.80	-	-	-	-	-	-	-	-
GW21	10.00	-7.37	4	-3.37	-7.37	5.44	2390	130	2.20	0.52	16.6	mild PAH	clear
GW22	10.00	-7.46	4	-3.46	-7.46	6.17	1198	636	10.74	2.48	18.0	slight HC	clear
GW23	10.00	-7.23	4	-3.23	-7.23	6.52	2269	362	6.11	0.66	17.8	slight HC	cloudy brown
GW24	10.00	-7.28	4	-3.28	-7.28	7.25	7450	107	1.81	0.18	19.5	mild HC	clear
GW25	10.00	-8.14	4	-4.14	-8.14	6.45	517	86	1.45	3.95	20.4	slight HC	cloudy brown
GW26	12.00	-10.16	5	-5.16	-10.16	6.9	3190	572	9.66	0.12	21.8	none	cloudy brown
GW27	10.50	-8.56	4	-4.36	-8.36	7.3	5817	11	0.19	3.67	18.6	none	clear
GW28	10.00	-8.19	4	-4.19	-8.19	7.65	2035	-111	-1.88	4.76	19.8	none	clear
GW29	12.00	-9.93	6	-3.93	-9.93	7.22	3600	25	0.42	4.97	19.6	none	light brown
GW30	10.50	-8.60	5	-3.60	-8.60	7.37	4760	33	0.56	4.79	17.7	mild NH_4 (?)	clear
GW31	10.50	-8.68	4	-4.68	-8.68	7.06	2157	9	0.15	0.35	19.3	none	cloudy brown
GW32	10.50	-8.60	4	-4.50	-8.50	7.69	1545	7	0.12	4.93	19	none	cloudy brown
GW33	10.50	-8.61	4	-4.61	-8.61	7.39	6100	70	1.18	6.7	19.5	none	cloudy brown
GW34	10.50	-8.48	4	-4.48	-8.48	7.52	4267	-22	-0.37	5.34	20.6	none	cloudy grey
GW35	10.50	-8.84	4	-4.74	-8.74	7.18	12016	-70	-1.18	3.3	19.9	none	turbid brown
GW36	10.40	-8.41	4	-4.41	-8.41	7.08	5450	93	1.57	3.27	18.1	none	clear
GW37	11.00	-9.04	4	-5.04	-9.04	7.06	3866	-69	-1.17	2.90	18.9	organic	cloudy grey
GW38	10.00	-8.03	4	-4.03	-8.03	6.88	5510	-47	-0.79	2.79	18.8	mild PAH	turbid grey
GW39	11.50	-9.09	4.5	-4.59	-9.09	6.52	3750	-90	-1.52	0.41	18.1	mild HC	cloudy dark grey
GW40	10.50	-8.18	4	-4.18	-8.18	7.1	1500	197	3.33	4.28	19.7	none	clear
GW41	10.00	-7.42	4	-3.42	-7.42	7.15	1663	135	2.28	3.77	19.2	none	light brown
GW42(D)	17.00	-14.39	3	-11.39	-14.39	6.3	31300	89	1.50	4.66	18.2	none	slight turbid yellow/brown
GW43(D)	17.40	-15.08	3.2	-11.88	-15.08	6.75	31833	120	2.03	0.03	19.8	none	clear
GW44(D)	18.00	-15.85	3.2	-12.65	-15.85	6.72	12383	9	0.15	0.09	18.6	strong NH_4/HC	dark grey/purple

TABLE 9 GROUNDWATER STANDING WATER ELEVATIONS

Well ID	Depth to Water		Elevation of measuring point (mAHD)		Standing water level
	from Top of Casing (mbtoc)	below ground surface (mbgl)	TOC mAHD	GS mAHD	SWL (mAHD)
GW01	7.46	7.47	1.96	1.97	-5.50
GW02	8.17	8.28	1.97	2.08	-6.20
GW03	8.00	8.06	2.375	2.435	-5.63
GW04	8.52	8.68	2.34	2.5	-6.18
GW05	8.10	8.27	1.94	2.11	-6.16
GW06	6.80	6.87	1.555	1.625	-5.25
GW07	7.43	7.49	1.775	1.835	-5.66
GW08	7.97	8.09	1.71	1.83	-6.26
GW09	8.82	9.01	1.67	1.86	-7.15
GW10	8.14	8.26	1.875	1.995	-6.27
GW11	7.21	7.31	1.75	1.85	-5.46
GW12	7.82	7.92	1.62	1.72	-6.20
GW13	7.60	7.69	1.82	1.91	-5.78
GW14	7.18	7.29	1.94	2.05	-5.24
GW15	9.10	9.22	2.195	2.315	-6.91
GW16	4.85	4.92	2.505	2.575	-2.35
GW18	Dry	Dry	2.43	2.53	Dry
GW19	7.65	7.75	2.31	2.41	-5.34
GW20	7.89	7.99	2.105	2.205	-5.79
GW21	8.01	8.11	2.535	2.635	-5.48
GW22	8.16	8.37	2.335	2.545	-5.83
GW23	8.78	8.885	2.67	2.775	-6.11
GW24	8.89	8.79	2.62	2.72	-6.07
GW25	7.75	7.88	1.73	1.86	-6.02
GW26	7.52	7.63	1.73	1.84	-5.79
GW27	8.22	8.29	1.87	1.94	-6.35
GW28	7.93	8.03	1.71	1.81	-6.22
GW29	8.49	8.62	1.945	2.075	-6.55
GW30	8.89	9.00	1.79	1.9	-7.10
GW31	7.10	7.24	1.68	1.82	-5.42
GW32	7.16	7.26	1.8	1.9	-5.36
GW33	7.22	7.32	1.79	1.89	-5.43
GW34	7.64	7.79	1.87	2.02	-5.77

Notes:

1. SWL = standing water level, mAHD = metres Australian Height Datum, mbgl = metres below ground level, TOC = top of casing, and GS = ground surface.
2. Richardson St sewer relative level = -3.75 mAHD.
3. Graham St sewer relative level = -11.73 mAHD.
4. Bridport St sewer relative level = -11.22 mAHD.
5. Pickle St sewer relative level = -8.10 mAHD.
6. Potentiometric surface contours are presented in Figure 3.

TABLE 9 GROUNDWATER STANDING WATER ELEVATIONS (CONTINUED)

Well ID	Measured Depth to Water		Elevation of measuring point (mAHD)		Standing groundwater elevation
	from Top of Casing (mbtoc)	below ground surface (mbgl)	TOC mAHD	GS mAHD	SWL (mAHD)
GW35	6.86	6.935	1.59	1.665	-5.27
GW36	7.21	7.28	1.92	1.99	-5.29
GW37	8.12	8.185	1.892	1.957	-6.23
GW38	8.99	9.084	1.874	1.968	-7.12
GW39	8.15	8.233	2.331	2.414	-5.82
GW40	7.51	7.678	2.149	2.317	-5.36
GW41	7.79	7.888	2.485	2.583	-5.31
GW42(D)	8.32	8.411	2.518	2.609	-5.80
GW43(D)	7.30	7.358	2.262	2.32	-5.04
GW44(D)	8.87	8.949	2.07	2.149	-6.80

Notes:

1. SWL = standing water level, mAHD = metres Australian Height Datum, mbgl = metres below ground level, TOC = top of casing, and GS = ground surface.
2. Richardson St sewer relative level = -3.75 mAHD.
3. Graham St sewer relative level = -11.73 mAHD.
4. Bridport St sewer relative level = -11.22 mAHD.
5. Pickle St sewer relative level = -8.10 mAHD.
6. Potentiometric surface contours are presented in Figure 3.
7. Groundwater levels at GW42D, 43D, and 44D in figures were corrected to equivalent freshwater heads, as follows. Note that the calculation is performed by: Calculated Freshwater Pressure Head Correction= (Difference in density against pure water/100)*pressure head). This calculated value is then added to the SWL_{GS} to obtain the calculated equivalent freshwater hydraulic head.

Well ID	Measured Depth to Water (mbtoc)	Pressure head, i.e. height of water column above screen (m)	TDS (mg/L)	Temp (C)	Calculated Density (Kg/m^3)	Difference in density against pure water (1,000 kg/m^3)	Calculated Freshwater Pressure Head Correction Factor (m)	Calculated equivalent freshwater hydraulic head (m)
GW42(D)	8.32	5.6	23,400	18.2	1016	1.6%	+0.09	-5.71
GW43(D)	7.30	6.8	19,400	19.0	1013	1.3%	+0.09	-4.95
GW44(D)	8.87	5.8	8,860	18.6	1005	0.5%	+0.03	-6.77

TABLE 10 AQUIFER PROPERTIES EVALUATED FROM SLUG TESTS

Groundwater Well	Test	Method	Coarsest Lithology in Screened Interval	Hydraulic conductivity, K (m/day)	Transmissivity, (m^2/day)
GW7	**rising**	Bouwer and Rice	Clayey Sand	0.14	-
GW40	**rising**	Bouwer and Rice	Fine Sand with minor clay	0.28	-
GW30	**rising**	Bouwer and Rice	Silty Sand	1.66	-
GW37	**rising**	Bouwer and Rice	Medium to Coarse Sand with some clay	0.67	-
Median for shallow wells				0.48	-
GW42D	**falling**	Cooper-Bredehoeft Papadopulos (CBP)	Medium Sand with minor clay	-	0.015
		Bouwer and Rice	Medium Sand with minor clay	0.0040	-
GW44	**falling**	CBP	Fine Sand with minor clay	-	0.566
		Bouwer and Rice	Fine Sand with minor clay	0.0930	-
	rising	CBP	Fine Sand with minor clay	-	0.601
		Bouwer and Rice	Fine Sand with minor clay	0.102	-
	mean of GW44 rising and falling	Bouwer and Rice, and CBP	Fine Sand with minor clay	0.098	0.58
Median for deeper wells				0.051	0.30
Mean (Shallow and deeper wells)				0.27	0.30*

Note: *For deep wells only

TABLE 11 INORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS

Analyte	LOR	Guidelines						GW1	GW3	GW4	GW19	GW21	GW22	GW23	GW24	GW31	GW39	GW35	GW40	GW41	GW42D	GW43D	GW44D
		Ecosystem[a]	Health[b]	*Recreation*[c]	Livestock[a]	Irrigation[a]	Trade waste[d]	18/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	18/4/11	20/4/11	18/04/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
pH Value	0.01	—	6.5-8.5*		—	4.0 - 9.0	6.0-10.0	7.17	6.6	7.11	5.43	5.44	6.17	6.52	7.25	7.06	6.52	7.18	7.1	7.15	6.3	6.75	6.72
TDS	5	—	1000*	—	**3000**	500	—	2780	**3410**	1010	2320	1590	662	1280	**4430**	1440	**3110**	**6450**	1040	1260	**23400**	**19400**	**8860**
Bicarbonate	1	—	—	—	—	—	—	712	295	374	83	48	290	397	828	295	262	648	204	273	174	500	1074
Sulfate	1	—	500	*10000*	**1000**	—	100	120	**2070**	222	700	981	209	388	**2340**	227	**2250**	503	28	226	***14800***	**1090**	**5020**
Chloride	1	—	250*	—	—	700	—	1040	64	57	56	74	90	38	42	550	57	3400	385	298	3380	9860	450
Calcium	1	—	—	—	—	1000	—	196	232	50	198	277	94	22	55	42	280	98	128	147	375	427	399
Magnesium	1	—	—	—	**600**	—	—	210	43	20	69	82	28	2	38	51	81	205	42	66	**787**	**694**	169
Sodium	1	—	—	—	—	120	—	400	62	180	51	24	111	39	67	454	68	2490	55	48	2450	5140	594
Potassium	1	—	—	—	—	—	—	53	16	26	43	38	35	8	21	49	17	43	27	24	217	212	48
Free Cyanide	0.004	—	—	—	—	—	—	0.012	0.005	0.1	<0.004	<0.004	<0.004	<0.004	0.01	<0.004	0.006	<0.004	<0.004	<0.004	0.013	<0.004	0.186
Total Cyanide	0.004	0.004	0.08	*1.6*	—	—	10	0.016	0.07	0.32	0.08	0.02	0.165	0.086	0.219	0.118	0.093	0.039	0.01	0.027	0.434	<0.004	*3.98*
WAD Cyanide	0.004	—	—	—	—	—	—	0.014	0.009	0.159	<0.004	<0.004	0.006	0.006	0.021	<0.004	0.009	<0.004	<0.004	<0.004	0.044	<0.004	0.865
Fluoride	0.1	—	1.5	*30*	**2**	1	30	1.3	1.3	0.6	0.6	0.4	0.6	0.1	0.3	**3.1**	1	1.8	1	1.4	1	0.3	0.6
Ammonia as N	0.01	0.91	0.5*	*0.5*/1.5*[#]	—	—	200	1.43	*660*	0.29	*184*	*26.8*	0.99	*201*	*854*	*10.4*	*430*	*4.25*	*8.90*	0.31	*2170*	4.11	*1,190*
Nitrite as N	0.01	—	—	—	**30**	—	—	0.1	<0.01	0.09	0.01	<0.01	0.14	0.05	0.02	0.03	0.55	0.01	0.01	<0.01	0.02	<0.01	0.03
Nitrate	0.01	—	50	*1000*	**400**	—	—	1.73	<0.04	69.6	0.66	0.44	3.5	2.13	23.7	6.06	2.92	0.04	1.24	0.4	<0.04	0.04	0.13
Phosphate	0.01	—	—	—	—	—	—	<0.03	<0.03	0.18	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	<0.03
Aluminium	0.01	—	0.2*	—	**5**	5	—	<0.01	<0.01	<0.01	0.17	0.14	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	3.91	<0.01	<0.01
Arsenic	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.051	0.01	0.12	***0.799***	*0.156*	0.008	0.077	0.039	*0.272*	0.011	*0.286*	0.007	0.014	0.031	0.002	0.038
Cadmium	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0012	0.0025	<0.0001
Cobalt	0.001	0.001	—	—	**1**	0.05	10	0.002	0.021	0.001	0.079	0.079	0.003	0.002	0.001	<0.001	0.04	0.002	<0.001	0.001	**9.66**	0.075	0.051
Copper	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.005	0.001	0.006	0.001	0.004	0.003	<0.001	0.004	0.002	0.001	0.002	0.001	0.001	0.051	0.007	0.009
Lead	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	<0.001	0.001	<0.001	0.01	0.006	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001
Manganese	0.001	—	0.5	*10*	—	—	10	0.197	4.18	0.01	*14.2*	2.19	0.045	0.037	0.019	0.083	5.5	0.792	0.124	0.132	*120*	7.63	*10.5*
Nickel	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.002	0.014	0.002	0.021	0.017	0.053	0.041	0.012	0.002	0.029	0.007	0.005	<0.001	*2.82*	0.067	0.072
Selenium	0.01	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	<0.01	0.01
Zinc	0.005	0.015	3*	—	**20**	2	10	0.024	0.017	<0.005	0.129	0.082	0.041	0.033	0.013	0.016	0.012	0.014	<0.005	<0.005	2.2	0.016	0.032
Boron	0.05	—	4	*80*	**5**	0.5	25	1.3	1.3	0.05	1.86	1.64	0.77	1.14	0.32	2.65	1.57	1.39	0.34	0.67	0.66	1.14	1.02
Iron	0.05	—	—	—	—	0.2	100	<0.05	27	0.23	309	53.8	0.06	3.69	0.13	0.06	29.5	0.09	<0.05	<0.05	12.9	0.4	11.1
Mercury	0.0001	0.0004	0.001	*0.02*	**0.002**	0.002	1	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	0.0002	<0.0001	<0.0001
Chromium VI	0.01	0.0044	0.05	*50*	**1**	0.1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

1. All results reported in mg/L.
2. LOR = laboratory limit of reporting.
3. Shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, **bold** = in excess of livestock guidelines, underline = in excess of irrigation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels).
5. [b] = guidelines taken from NHMRC and ARMCANZ (2004.2011) *Australian drinking water guidelines*; * = aesthetic only (not health based).
6. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
7. [d] = guidelines taken from South East Water (2011) Standards for Trade Waste Discharge to the Sewer System.
8. [#] = odour threshold of ammonia in water.
9. — = guideline not available.
10. Note that ammonia ecosystem criteria have not been adjusted (upwards) for pH as per Table 8.3.7 of ANZECC/ARMCANZ (2000) and Cu, Cr, Cd, Pb, Ni and Zn ecosystem criteria have not been modified (upwards) for hardness based on Table 3.4.3 of ANZECC/ARMCANZ (2000).
11. Laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219).

TABLE 11 INORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS (CONTINUED)

Analyte	LOR	Guidelines						DUP1	SPLIT1	DUP3	SPLIT3	DUP4	SPLIT4
		Ecosystem[a]	Health[b]	*Recreation*[c]	**Livestock**[a]	Irrigation[a]	Trade waste[d]	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
pH Value	0.01	—	6.5-8.5*		—	4.0 - 9.0	6.0-10.0	6.49	6.4	7.34	7.31	6.22	6.29
TDS	5	—	1000*	—	**3000**	500	—	**3270**	**3100**	**4170**	**4340**	**22,600**	**21,500**
Bicarbonate	1	—	—	—	—	—	—	184	186	682	684	136	140
Sulfate	1	—	500	*10000*	**1000**	—	100	**2140**	**1950**	**2710**	**2470**	***14,800***	***15,000***
Chloride	1	—	250*	—	—	700	—	66	64	43	46	2620	2920
Calcium	1	—	—	—	—	1000	—	246	243	50	47	396	386
Magnesium	1	—	—	—	**600**	—	—	46	45	36	35	**812**	**785**
Sodium	1	—	—	—	—	120	—	70	68	57	55	2580	2450
Potassium	1	—	—	—	—	—	—	16	15	16	16	224	216
Free Cyanide	0.004	—	—	—	—	—	—	0.007	0.014	0.01	0.011	0.016	0.021
Total Cyanide	0.004	0.004	0.08	*1.6*	—	—	10	0.07	0.072	0.253	0.211	0.509	0.456
WAD Cyanide	0.004	—	—	—	—	—	—	0.016	0.014	0.021	0.024	0.046	0.037
Fluoride	0.1	—	1.5	*30*	**2**	1	30	1.1	1.1	0.3	0.3	1	1
Ammonia as N	0.01	0.91	0.5*	*0.5*/1.5*[#]	—	—	200	*450*	*458*	*1000*	*1020*	*2100*	*2160*
Nitrite as N	0.01	—	—	—	**30**	—	—	<0.01	<0.01	0.04	0.02	0.05	0.02
Nitrate	0.01	—	50	*1000*	**400**	—	—	<0.0443	<0.0443	17.45	16.44	<0.0443	<0.0443
Phosphate	0.01	—	—	—	—	—	—	<0.0306	<0.0306	<0.0306	<0.0306	<0.0306	<0.0306
Aluminium	0.01	—	0.2*	—	**5**	5	—	<0.01	<0.01	<0.01	<0.01	3.15	3.02
Arsenic	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.012	0.01	0.041	0.043	0.025	0.025
Cadmium	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	0.0013
Cobalt	0.001	0.001	—	—	**1**	0.05	10	0.024	0.024	0.002	0.002	**9.63**	**9.37**
Copper	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.001	0.001	0.004	0.003	0.048	0.045
Lead	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	<0.001	0.001	0.002	0.001	<0.001
Manganese	0.001	—	0.5	*10*	—	—	10	4.03	3.88	0.021	0.02	*121*	*118*
Nickel	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.02	0.007	0.013	0.015	***2.84***	***2.81***
Selenium	0.01	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	***0.03***	***0.03***
Zinc	0.005	0.015	3*	—	**20**	2	10	0.071	0.013	0.012	0.013	2.16	2.15
Boron	0.05	—	4	*80*	**5**	0.5	25	1.37	1.39	0.33	0.34	0.66	0.67
Iron	0.05	—	—	—	—	0.2	100	21.7	20.6	0.1	0.11	12.8	12.4
Mercury	0.0001	0.0004	0.001	*0.02*	**0.002**	0.002	1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium VI	0.01	0.0044	0.05	*50*	**1**	0.1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

1. All results reported in mg/L.
2. LOR = laboratory limit of reporting.
3. Shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, **bold** = in excess of livestock guidelines, underline = in excess of irrigation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels).
5. [b] = guidelines taken from NHMRC and ARMCANZ (2004.2011) *Australian drinking water guidelines*; * = aesthetic only (not health based).
6. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
7. [d] = guidelines taken from South East Water (2011) Standards for Trade Waste Discharge to the Sewer System.
8. [#] = odour threshold of ammonia in water.
9. — = guideline not available.
10. Note that ammonia ecosystem criteria have not been adjusted (upwards) for pH as per Table 8.3.7 of ANZECC/ARMCANZ (2000) and Cu, Cr, Cd, Pb, Ni and Zn ecosystem criteria have not been modified (upwards) for hardness based on Table 3.4.3 of ANZECC/ARMCANZ (2000).
11. Laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219).

TABLE 12 INORGANIC GROUNDWATER RESULTS SUMMARY – NORTH WEST WELLS

Analyte	LOR	Guidelines						GW6	GW32	GW33	GW34	GW36
		Ecosystem[a]	Health[b]	*Recreation*[c]	Livestock[a]	Irrigation[a]	Trade waste[d]	18/04/11	19/04/2011	18/04/11	18/04/11	20/04/11
pH Value	0.01	—	6.5-8.5*		—	4.0-9.0	6.0-10.0	6.97	7.69	7.39	7.52	7.08
TDS	5	—	1000*	—	**3000**	500	—	1190	1310	**3480**	**3010**	**3400**
Bicarbonate	1	—	—	—	—	—	—	319	700	382	54	975
Sulfate	1	—	500	*10000*	**1000**	—	100	72	216	**1930**	**1440**	440
Chloride	1	—	250*	—	—	700	—	466	41	1050	243	1320
Calcium	1	—	—	—	—	1000	—	44	131	379	30	93
Magnesium	1	—	—	—	**600**	—	—	51	63	383	54	113
Sodium	1	—	—	—	—	120	—	247	73	672	776	931
Potassium	1	—	—	—	—	—	—	17	30	168	42	35
Free Cyanide	0.004	—	—	—	—	—	—	0.006	0.006	<0.004	0.005	<0.004
Total Cyanide	0.004	0.004	0.08	*1.6*	—	—	10	0.006	0.226	0.058	0.24	0.053
WAD Cyanide	0.004	—	—	—	—	—	—	0.007	0.007	0.007	0.01	<0.004
Fluoride	0.1	—	1.5	*30*	**2**	1	30	1.3	**2.3**	1.2	0.2	1.9
Ammonia as N	0.01	0.91	0.5*	*0.5*/1.5*[#]	—	—	200	0.43	*12.5*	*8.43*	0.41	*3.76*
Nitrite as N	0.01	—	—	—	**30**	—	—	0.01	0.02	0.02	0.04	0.08
Nitrate	0.01	—	50	*1000*	**400**	—	—	3.94	7.4	18.2	0.31	12.27
Phosphate	0.01	—	—	—	—	—	—	<0.03	<0.03	<0.03	0.33	<0.03
Aluminium	0.01	—	0.2*	—	**5**	5	—	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.002	*0.318*	0.01	*0.396*	0.025
Cadmium	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	0.001	0.001	—	—	**1**	0.05	10	<0.001	<0.001	0.005	0.002	0.002
Copper	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.003	0.003	0.006	0.003	0.004
Lead	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	0.001	—	0.5	*10*	—	—	10	0.018	0.176	0.32	0.021	0.241
Nickel	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.004	0.002	0.006	0.003	0.005
Selenium	0.01	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.005	0.015	3*	—	**20**	2	10	0.01	0.006	0.012	<0.005	0.009
Boron	0.05	—	4	*80*	**5**	0.5	25	1.54	0.83	3.38	**6.88**	1.3
Iron	0.05	—	—	—	—	0.2	100	<0.05	0.06	<0.05	0.1	<0.05
Mercury	0.0001	0.0004	0.001	*0.02*	**0.002**	0.002	1	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Chromium VI	0.01	0.0044	0.05	*50*	**1**	0.1	10	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

1. All results reported in mg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, **bold** = in excess of livestock guidelines, underline = in excess of irrigation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels).
5. [b] = guideline taken from NHMRC and ARMCANZ (2004) *Australian drinking water guidelines*; * = aesthetic only (not health based).
6. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
7. [d] = guidelines taken from South East Water (2011) Standards for Trade Waste Discharge to the Sewer System.
8. [#] = odour threshold of ammonia in water.
9. — = guideline not available.
10. Note that ammonia ecosystem criteria have not been adjusted (upwards) for pH as per Table 8.3.7 of ANZECC/ARMCANZ (2000) and Cu, Cr, Cd, Pb, Ni and Zn ecosystem criteria have not been modified (upwards) for hardness based on Table 3.4.3 of ANZECC/ARMCANZ (2000).
11. Laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219).

TABLE 13 INORGANIC GROUNDWATER RESULTS SUMMARY – NORTH EAST WELLS

Analyte	LOR	Guidelines						GW7	GW8	GW26	GW27	GW28	GW29	GW30	GW37	GW38	DUP2	SPLIT2
		Ecosystem[a]	Health[b]	*Recreation*[c]	**Livestock**[a]	Irrigation[a]	Trade waste[d]	2/05/11	19/04/11	2/05/11	20/04/11	19/04/11	18/04/11	19/04/11	19/04/11	19/04/11	19/04/11	19/04/11
pH Value	0.01	—	6.5-8.5*		—	4.0-9.0	6.0-10.0	6.52	6.27	6.9	7.3	7.65	7.22	7.37	7.06	6.88	7.66	7.8
TDS	5	—	1000*	—	**3000**	500	—	1640	2740	1740	**3610**	1540	2450	**3050**	2260	**3770**	1600	920
Bicarbonate	1	—	—	—	—	—	—	810	278	349	617	447	572	525	547	455	364	390
Sulfate	1	—	500	*10000*	**1000**	—	100	225	**1510**	306	711	167	353	573	**1060**	585	180	200
Chloride	1	—	250*	—	—	700	—	212	290	564	1100	332	735	1020	154	200	330	300
Calcium	1	—	—	—	—	1000	—	47	130	86	73	30	57	88	67	102	33	32
Magnesium	1	—	—	—	**600**	—	—	35	50	69	75	26	56	83	37	46	27	24
Sodium	1	—	—	—	—	120	—	277	173	469	941	351	602	733	120	301	360	240
Potassium	1	—	—	—	—	—	—	8	8	8	10	6	7	7	9	13	6	6.8
Free Cyanide	0.004	—	—	—	—	—	—	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.01	<0.004	0.016
Total Cyanide	0.004	0.004	0.08	*1.6*	—	—	10	0.047	0.014	0.005	0.004	0.033	<0.004	<0.004	0.39	0.055	0.032	0.029
WAD Cyanide	0.004	—	—	—	—	—	—	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005	0.013	<0.004	0.009
Fluoride	0.1	—	1.5	*30*	**2**	1	30	1.5	0.2	0.6	1	1.4	0.8	1.6	1.1	0.7	1.4	1.1
Ammonia as N	0.01	0.91	0.5*	*0.5*/*1.5*[#]	—	—	200	*112*	*318*	0.96	0.60	*76.3*	0.10	0.44	*358*	*511*	*86.4*	-
Nitrite as N	0.01	—	—	—	**30**	—	—	0.01	0.05	0.01	0.03	0.01	0.09	0.15	0.44	0.13	0.11	0.005
Nitrate	0.01	—	50	*1000*	**400**	—	—	<0.04	1.06	1.32	45.2	<0.04	62.9	19.89	2.08	0.27	<0.0443	<0.0443
Phosphate	0.01	—	—	—	—	—	—	<0.03	<0.03	<0.03	0.12	<0.03	<0.03	<0.03	<0.03	<0.03	<0.0306	<0.0153
Aluminium	0.01	—	0.2*	—	**5**	5	—	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.041
Arsenic	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.084	0.012	0.038	0.003	*0.189*	0.002	0.064	0.041	0.034	*0.201*	*0.19*
Cadmium	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	0.001	0.001	—	—	**1**	0.05	10	<0.001	0.006	0.016	0.003	<0.001	0.005	0.007	0.003	0.002	<0.001	<0.001
Copper	0.001	0.0013	2	*40*	**0.5**	0.2	10	<0.001	0.003	<0.001	0.004	0.002	0.005	0.003	0.002	0.003	0.001	<0.001
Lead	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	0.001	<0.001	<0.001	0.003	0.002	0.01	<0.001	0.004	0.004	<0.001
Manganese	0.001	—	0.5	*10*	—	—	10	0.138	1.35	1.97	0.231	0.17	0.403	0.434	0.298	1.08	0.169	0.19
Nickel	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.007	0.066	0.009	0.023	0.014	0.008	0.005	0.008	0.283	0.01	0.009
Selenium	0.01	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002
Zinc	0.005	0.015	3*	—	**20**	2	10	0.026	0.052	<0.005	0.019	<0.005	0.021	0.017	0.01	0.014	0.005	0.003
Boron	0.05	—	4	*80*	**5**	0.5	25	0.84	0.91	0.3	0.65	0.74	0.46	0.44	0.71	0.96	0.78	0.7
Iron	0.05	—	—	—	—	0.2	100	0.12	3.5	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	<0.05	<0.05	0.59
Mercury	0.0001	0.0004	0.001	*0.02*	**0.002**	0.002	1	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
Chromium VI	0.01	0.0044	0.05	*50*	**1**	0.1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005

Notes:

1. All results reported in mg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, **bold** = in excess of livestock guidelines, underline = in excess of irrigation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels).
5. [b] = guideline taken from NHMRC and ARMCANZ (2004) *Australian drinking water guidelines*; * = aesthetic only (not health based).
6. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
7. [d] = guidelines taken from South East Water (2011) Standards for Trade Waste Discharge to the Sewer System.
8. [#] = odour threshold of ammonia in water.
9. — = guideline not available.
10. Note that ammonia ecosystem criteria have not been adjusted (upwards) for pH as per Table 8.3.7 of ANZECC/ARMCANZ (2000) and Cu, Cr, Cd, Pb, Ni and Zn ecosystem criteria have not been modified (upwards) for hardness based on Table 3.4.3 of ANZECC/ARMCANZ (2000).
11. Laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219).

TABLE 14 INORGANIC GROUNDWATER RESULTS SUMMARY – SOUTH EAST WELLS

Analyte	LOR	Guidelines						GW9	GW10	GW11	GW12	GW13	GW14	GW15	GW16	GW25
		Ecosystem[a]	Health[b]	*Recreation*[c]	**Livestock**[a]	Irrigation[a]	Trade waste[d]	19/04/11	20/04/11	20/04/11	19/04/11	20/04/11	20/04/11	20/04/11	20/04/11	20/04/11
pH Value	0.01	—	6.5-8.5*		—	4.0-9.0	6.0-10.0	6.65	5.23	5.55	6.91	6.25	6.67	6.11	7.2	6.45
TDS	5	—	1000*	—	**3000**	500	—	548	590	288	546	406	368	364	156	360
Bicarbonate	1	—	—	—	—	—	—	105	10	12	182	33	100	32	69	76
Sulfate	1	—	500	*10000*	**1000**	—	100	54	303	93	142	126	111	191	46	128
Chloride	1	—	250*	—	—	700	—	150	65	54	80	75	55	<1	13	100
Calcium	1	—	—	—	—	1000	—	4	4	<1	2	4	23	12	6	12
Magnesium	1	—	—	—	**600**	—	—	3	3	<1	1	4	27	12	6	8
Sodium	1	—	—	—	—	120	—	168	192	89	202	111	43	101	41	132
Potassium	1	—	—	—	—	—	—	4	3	1	4	10	22	13	7	11
Free Cyanide	0.004	—	—	—	—	—	—	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Total Cyanide	0.004	0.004	0.08	*1.6*	—	—	10	<0.004	<0.004	0.009	<0.004	0.008	0.014	0.006	<0.004	0.008
WAD Cyanide	0.004	—	—	—	—	—	—	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoride	0.1	—	1.5	*30*	**2**	1	30	0.4	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1
Ammonia as N	0.01	0.91	0.5*	0.5*/*1.5*[#]	—	—	200	0.52	0.43	0.04	<0.01	0.07	0.85	0.19	0.01	*2.11*
Nitrite as N	0.01	—	—	—	**30**	—	—	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate	0.01	—	50	*1000*	**400**	—	—	93	<0.04	0.09	6.87	0.23	0.53	0.27	1.46	1.06
Phosphate	0.01	—	—	—	—	—	—	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Aluminium	0.01	—	0.2*	0.2*	**5**	5	—	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.03	<0.01
Arsenic	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.004	0.006	0.002	0.008	0.003	0.005	<0.001	0.001	0.002
Cadmium	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	0.001	0.001	—	—	**1**	0.05	10	<0.001	0.001	<0.001	<0.001	<0.001	0.004	0.008	<0.001	<0.001
Copper	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.001	0.007	0.002	0.005	0.002	0.001	0.002	<0.001	0.003
Lead	0.001	0.0044	0.01	*0.2*	**0.1**	2	10	<0.001	<0.001	<0.001	<0.001	0.008	<0.001	0.001	<0.001	<0.001
Manganese	0.001	—	0.5	*10*	—	—	10	0.007	0.022	0.002	<0.001	0.014	0.061	0.058	0.002	0.014
Nickel	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.004	0.037	<0.001	0.007	0.003	0.005	0.01	<0.001	0.003
Selenium	0.01	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.005	0.015	3*	3*	**20**	2	10	0.014	0.032	<0.005	<0.005	0.018	0.007	0.016	0.045	<0.005
Boron	0.05	—	4	*80*	**5**	0.5	25	0.45	0.18	0.26	0.36	0.87	0.94	1.02	0.51	1
Iron	0.05	—	—	—	—	0.2	100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Mercury	0.0001	0.0004	0.001	*0.02*	**0.002**	0.002	1	0.0001	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium VI	0.01	0.0044	0.05	*50*	**1**	0.1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

1. All results reported in mg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, **bold** = in excess of livestock guidelines, underline = in excess of irrigation guidelines, and boxed= in excess of trade waste guidelines.
4. [a] = guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels).
5. [b] = guideline taken from NHMRC and ARMCANZ (2004) *Australian drinking water guidelines*; * = aesthetic only (not health based).
6. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
7. [d] = guidelines taken from South East Water (2011) Standards for Trade Waste Discharge to the Sewer System.
8. [#] = odour threshold of ammonia in water.
9. — = guideline not available.
10. Note that ammonia ecosystem criteria have not been adjusted (upwards) for pH as per Table 8.3.7 of ANZECC/ARMCANZ (2000) and Cu, Cr, Cd, Pb, Ni and Zn ecosystem criteria have not been modified (upwards) for hardness based on Table 3.4.3 of ANZECC/ARMCANZ (2000).
11. Laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219).

TABLE 15 ORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS

Analyte	LOR	Guidelines				GW1	GW3	GW4	GW19	GW21	GW22	GW23	GW24	GW31	GW39	GW40	GW41	GW42D	GW43D	GW44D
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	18/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	18/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
Oxygenated Compounds																				
2-Butanone (MEK)	50	—	—	—	—	<50	<50	<50	<50	<50	<50	<50	<1000	<50	<50	<50	<50	<50	<50	520
Halogenated Aromatic Compounds																				
Chlorobenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	8	<5	<10
Polynuclear Aromatic Hydrocarbons (PAH)																				
Naphthalene (via USEPA SW 846-8270D – see notes)	1	70	—	—	—	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	1.2	1,820	<1.0	22.3	<1.0	<1.0	21.3	<1.0	142
Naphthalene (via USEPA SW 846-8260B – see notes)	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	4,530	<5	18	<5	<5	33	<5	776
Acenaphthylene	1	—	—	—	—	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	58.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100
Acenaphthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4	<10.0	<1.0	4.1	<1.0	<1.0	<1.0	<1.0	<100
Fluorene	1	—	—	—	—	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	20.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100
Phenanthrene	1	2	—	—	—	<1.0	3.4	6.2	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	1.6	4.5	<1.0	2	<100
Anthracene	1	0.4	—	—	—	<1.0	1.1	2.1	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<100
Fluoranthene	1	1.4	—	—	—	<1.0	2.4	8.4	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	2.8	8.3	<1.0	2.1	<100
Pyrene	1	—	—	—	—	<1.0	2	7.8	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	2.6	8.5	<1.0	1.7	<100
Benz(a)anthracene	1	—	—	—	—	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	4.1	<1.0	<1.0	<100
Chrysene	1	—	—	—	—	<1.0	<1.0	2.3	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	1.2	3.5	<1.0	<1.0	<100
Benzo(b)fluoranthene	1	—	—	—	—	<1.0	<1.0	2.7	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	1.2	4.9	<1.0	<1.0	<100
Benzo(k)fluoranthene	1	—	—	—	—	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<100
Benzo(a)pyrene	0.5	0.2	0.01	*0.2*	—	<0.6	<0.6	*2.2*	<0.5	<0.6	<0.6	<0.6	*<5.6*	<0.5	<0.6	*0.9*	*3.6*	<0.5	<0.5	*<53.8*
Indeno(1.2.3.cd)pyrene	1	—	—	—	—	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	<100
Dibenz(a.h)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100
Benzo(g.h.i)perylene	1	—	—	—	—	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0	<100
Sum of PAH	0.5	—	—	—	—	---	11.1	39.3	<1.1	<1.2	<1.2	3.6	1,900	---	26.4	10.3	44.5	21.3	5.8	142
Monocyclic Aromatic Hydrocarbons																				
Styrene	5	—	30	—	2,000	<5	<5	<5	<5	<5	<5	<5	193	<5	<5	<5	<5	<5	<5	<10
1.2.4-Trimethylbenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	185	<5	<5	<5	<5	<5	<5	49
1.3.5-Trimethylbenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	18
BTEX																				
Benzene	1	700	1	*1*	1,000	<1	*2*	<1	<1	<1	<1	*16*	*6,350*	<1	*28*	<1	<1	*355*	<1	*1,350*
Toluene	2	180	800	—	2,000	<2	<2	<2	<2	<2	<2	<2	318	<2	4	<2	<2	61	12	712
Ethylbenzene	2	5	300	—	2,000	<2	<2	<2	<2	<2	<2	13	111	<2	2	<2	<2	3	<2	46
meta- & para-Xylene	2	—	—	—	—	<2	3	<2	<2	<2	<2	<2	1,550	<2	4	<2	<2	11	<2	285
ortho-Xylene	2	—	—	—	—	<2	<2	<2	<2	<2	<2	3	739	<2	4	<2	<2	9	<2	150
Total Xylenes	2	—	600	*20*[b#]	2,000	<2	3	<2	<2	<2	<2	3	2,290	<2	8	<2	<2	20	<2	*435*
Sum of BTEX	1	—	—	—	—	<1	5	<1	<1	<1	<1	32	9,070	<1	42	<1	<1	439	12	2,540

TABLE 15 ORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS (CONTINUED)

Analyte	LOR	Guidelines				GW1	GW3	GW4	GW19	GW21	GW22	GW23	GW24	GW31	GW39	GW40	GW41	GW42D	GW43D	GW44D
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	18/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	18/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
Total Petroleum Hydrocarbons (TPH)																				
TPH C_6 - C_9 Fraction	20	150*	150*	—	1,000	<20	<20	<20	<20	<20	<20	70	9,780	<20	60	<20	<20	470	<20	3,380
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	<50	420	<50	<50	<50	<50	380	14,200	<50	440	<50	<50	2,960	<50	251,000
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	270	1,440	570	1,110	<100	<100	1,250	6,120	<100	1,590	<100	150	1,560	180	32200
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	60	150	510	140	<50	<50	170	220	<50	140	70	110	200	210	1770
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	330	2,010	1,080	1,250	<50	<50	1,800	20,500	<50	2,170	70	260	4,720	390	285,000
Total Recoverable Hydrocarbons (TRH)																				
TRH C_6 – C_{10} Fraction	20	—	—	—	—	<20	<20	<20	<20	<20	<20	120	9720	<20	70	<20	<20	480	20	3540
TRH C_6 – C_{10} Fraction minus BTEX	20	—	—	—	—	<20	<20	<20	<20	<20	<20	90	<2000	<20	30	<20	<20	40	<20	1000
>TRH C_{10} – C_{16} Fraction	100	—	—	—	—	<100	610	<100	120	<100	<100	550	14600	<100	690	<100	<100	1750	<100	230000
>TRH C_{16} – C_{34} Fraction	100	—	—	—	—	290	1300	910	1100	<100	<100	1160	4670	<100	1390	120	220	1410	330	25000
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	<100	<100	290	<100	<100	<100	<100	<100	<100	<100	<100	<100	110	150	710
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	290	1910	1200	1220	<100	<100	1710	19300	<100	2080	120	220	3270	480	256000
TPH Speciation																				
TPH Aromatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	12,100	—	<50	—	—	—	<50	56,500
TPH Aromatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	300	—	<100	—	—	—	<100	800
TPH Aromatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	—	<50	—	—	—	<50	<50
TPH Aliphatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	—	<50	—	—	—	<50	<50
TPH Aliphatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	<100	—	<100	—	—	—	<100	<100
TPH Aliphatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	—	<50	—	—	—	<50	<50
TPH - Silica gel cleanup																				
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	<100	70	<250	<50	—	—	—	12,300	—	170	—	—	<250	<50	56,600
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	<200	<100	<500	<100	—	—	—	550	—	<100	—	—	<500	<100	1,180
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	<100	<50	350	<50	—	—	—	<50	—	<50	—	—	<250	<50	<50
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	<100	70	350	<50	—	—	—	12,850	—	170	—	—	<250	<50	57,800
Total Recoverable Hydrocarbons (TRH) – Silica Gel Cleanup																				
>TPH C_{10} - C_{16} Fraction	100	—	—	—	—	<200	130	<500	<100	—	—	—	10100	—	230	—	—	<500	<100	45300
>TPH C_{16} – C_{34} Fraction	100	—	—	—	—	<200	<100	<500	<100	—	—	—	260	—	<100	—	—	<500	<100	500
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	<200	<100	<500	<100	—	—	—	<100	—	<100	—	—	<500	<100	<100
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	<200	130	<500	<100	—	—	—	10400	—	230	—	—	<500	<100	45800

Notes:

1. All results reported in µg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels);
5.
6. [b] = guideline taken from NHMRC and ARMCANZ (2004, 2011) Australian drinking water guidelines for health; # indicates aesthetic criteria adopted from NHMRC and ARMCANZ (2004, 2011).
7. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
8. [d] = guidelines taken from City West Water (2011) Standards for trade waste discharge to the sewer system.
9. [e] =toluene and ethylbenzene values taken from low reliability values for marine ecosystems presented in Table 8.3.14 of ANZECC (2000); * =guidelines taken from Netherlands (1994) intervention values.
10. — = guideline not available or analysis not undertaken.
11. USEPA SW 846-8270D = sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).
12. USEPA SW 846-8260B = water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).

TABLE 15 ORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS (CONTINUED)

Analyte	LOR	Guidelines				DUP1 (GW3)	SPLIT1 (GW3)	DUP3 (GW24)	SPLIT3 (GW24)	DUP4 (GW42D)	SPLIT4 (GW42D)
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
Oxygenated Compounds											
2-Butanone (MEK)	50	—	—	—	—	—	—	—	—	—	—
Halogenated Aromatic Compounds											
Chlorobenzene	5	—	—	—	—	<5	<5	<100	<100	8	8
Polynuclear Aromatic Hydrocarbons (PAH)											
Naphthalene (via USEPA SW 846-8270D – see notes)	1	70	—	—	—	1.4	1.6	2980	2710	25.5	27.3
Naphthalene (via USEPA SW 846-8260B – see notes)	5	—	—	—	—	19	8	4020	5180	36	36
Acenaphthylene	1	—	—	—	—	<1	<1	23.9	31.5	<1	<1
Acenaphthene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Fluorene	1	—	—	—	—	<1	<1	15.4	14.6	<1	<1
Phenanthrene	1	2	—	—	—	<1	<1	<10	<10	<1	<1
Anthracene	1	0.4	—	—	—	<1	<1	<10	<10	<1	<1
Fluoranthene	1	1.4	—	—	—	<1	<1	<10	<10	<1	<1
Pyrene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Benz(a)anthracene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Chrysene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Benzo(b)fluoranthene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Benzo(k)fluoranthene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Benzo(a)pyrene	0.5	0.2	0.01	*0.2*	—	<0.6	<0.6	<5.6	<5.5	<0.6	<0.6
Indeno(1.2.3.cd)pyrene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Dibenz(a.h)anthracene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Benzo(g.h.i)perylene	1	—	—	—	—	<1	<1	<10	<10	<1	<1
Sum of PAH	0.5	—	—	—	—	1.4	1.6	3020	2760	25.5	27.3
Monocyclic Aromatic Hydrocarbons											
Styrene	5	—	30	—	2,000	<5	<5	196	205	<5	<5
1.2.4-Trimethylbenzene	5	—	—	—	—	<5	<5	205	220	<5	<5
1.3.5-Trimethylbenzene	5	—	—	—	—	<5	<5	102	<100	<5	<5
BTEX											
Benzene	1	700	1	*1*	1,000	*3*	*3*	*5340*	*5250*	*334*	*364*
Toluene	2	180	800	—	2,000	3	3	282	287	63	62
Ethylbenzene	2	5	300	—	2,000	3	3	116	119	3	3
meta- & para-Xylene	2	—	—	—	—	6	6	1560	1600	11	10
ortho-Xylene	2	—	—	—	—	4	4	728	766	9	9
Total Xylenes	2	—	600	*20*[b#]	2,000	10	10	*2290*	*2370*	20	19
Sum of BTEX	1	—	—	—	—	0.019	0.019	8.03	8.02	0.42	0.448

TABLE 15 ORGANIC GROUNDWATER RESULTS SUMMARY – ONSITE WELLS (CONTINUED)

Analyte	LOR	Guidelines				DUP1 (GW3)	SPLIT1 (GW3)	DUP3 (GW24)	SPLIT3 (GW24)	DUP4 (GW42D)	SPLIT4 (GW42D)
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11	20/4/11
Total Petroleum Hydrocarbons (TPH)											
TPH C_6 - C_9 Fraction	20	150*	150*	—	1,000	30	40	9990	10,200	480	460
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	480	530	14,200	12,400	2910	3070
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	1410	1480	5510	4760	1500	1880
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	230	180	150	140	200	280
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	2120	2190	19,900	17,300	4610	5230
Total Recoverable Hydrocarbons (TRH)											
TRH C_6 – C_{10} Fraction	20	—	—	—	—	0.05	0.05	9.93	10.1	0.48	0.47
TRH C_6 – C_{10} Fraction minus BTEX	20	—	—	—	—	0.03	0.03	<2	2.08	0.06	0.02
>TRH C_{10} – C_{16} Fraction	100	—	—	—	—	0.71	0.79	14.2	12.2	1.7	1.84
>TRH C_{16} – C_{34} Fraction	100	—	—	—	—	1.32	1.34	4.32	3.74	1.37	1.76
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	0.19	0.13	<0.1	<0.1	0.1	0.18
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	2220	2260	18,500	15,900	3170	3780

Notes:

1. All results reported in µg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels);
5.
6. [b] = guideline taken from NHMRC and ARMCANZ (2004, 2011) Australian drinking water guidelines for health; # indicates aesthetic criteria adopted from NHMRC and ARMCANZ (2004, 2011).
7. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
8. [d] = guidelines taken from City West Water (2011) Standards for trade waste discharge to the sewer system.
9. [e] =toluene and ethylbenzene values taken from low reliability values for marine ecosystems presented in Table 8.3.14 of ANZECC (2000); * =guidelines taken from Netherlands (1994) intervention values.
10. — = guideline not available or analysis not undertaken.
11. USEPA SW 846-8270D = sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).
12. USEPA SW 846-8260B = water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).

TABLE 16 ORGANIC GROUNDWATER RESULTS SUMMARY – NORTH WEST WELLS

Analyte	LOR	Guidelines				GW6	GW32	GW33	GW34	GW35	GW36
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	18/04/11	19/04/11	18/04/11	18/04/11	18/04/11	20/04/11
Oxygenated Compounds											
2-Butanone (MEK)	50	—	—	—	—	<50	<50	<50	<50	<50	<50
Polynuclear Aromatic Hydrocarbons (PAH)											
Naphthalene (via USEPA SW 846-8270D – see notes)	1	70	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene (via USEPA SW 846-8260B – see notes)	5	—	—	—	—	<5	<5	<5	<5	<5	<5
Acenaphthylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	1	2	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	1	0.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	1	1.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	0.5	0.2	0.01	*0.2*	—	<0.5	<0.5	<0.5	<0.5	<0.5	<0.6
Indeno(1.2.3.cd)pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of PAH	0.5	—	—	—	—	---	<1.0	---	---	---	<1.1
Monocyclic Aromatic Hydrocarbons											
Styrene	5	—	30	—	2,000	<5	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5
BTEX											
Benzene	1	700	1	*1*	1,000	<1	*5*	<1	<1	<1	<1
Toluene	2	180	800	—	2,000	<2	<2	<2	<2	<2	<2
Ethylbenzene	2	5	300	—	2,000	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	2	—	—	—	—	<2	<2	<2	<2	<2	<2
ortho-Xylene	2	—	—	—	—	<2	<2	<2	<2	<2	<2
Total Xylenes	2	—	600	*20*[b#]	2,000	<2	<2	<2	<2	<2	<2
Sum of BTEX	1	—	—	—	—	<1	5	<1	<1	<1	<1

TABLE 16 ORGANIC GROUNDWATER RESULTS SUMMARY – NORTH WEST WELLS (CONTINUED)

Analyte	LOR	Guidelines				GW6	GW32	GW33	GW34	GW35	GW36
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	18/04/11	19/04/11	18/04/11	18/04/11	18/04/11	20/04/11
Total Petroleum Hydrocarbons (TPH)											
TPH C_6 - C_9 Fraction	20	150*	150*	—	1,000	<20	<20	<20	<20	<20	<20
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	<50	<50	<50	<50	<50	<50
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	<100	<100	<100	<100	280	<100
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	<50	<50	<50	<50	<50	<50
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	<50	<50	<50	<50	280	<50
Total Recoverable Hydrocarbons (TRH)											
TRH C_6 – C_{10} Fraction	20	—	—	—	—	<20	<20	<20	<20	<20	<20
TRH C_6 – C_{10} Fraction minus BTEX	20	—	—	—	—	<20	<20	<20	<20	<20	<20
>TRH C_{10} – C_{16} Fraction	100	—	—	—	—	<100	<100	<100	<100	<100	<100
>TRH C_{16} – C_{34} Fraction	100	—	—	—	—	<100	<100	<100	<100	240	<100
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	<100	<100	<100	<100	<100	<100
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	<100	<100	<100	<100	240	<100
TPH Speciation											
TPH Aromatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	—	—	—	—	—
TPH Aromatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	—	—	—	—	—
TPH Aromatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	—	—	—	—	—
TPH Aliphatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	—	—	—	—	—
TPH Aliphatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	—	—	—	—	—
TPH Aliphatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	—	—	—	—	—
TPH - Silica gel cleanup											
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	—	—	—	—	<100	—
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	—	—	—	—	<200	—
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	—	—	—	—	<100	—
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	—	—	—	—	<100	—
Total Recoverable Hydrocarbons (TRH) – Silica Gel Cleanup											
>TPH C_{10} - C_{16} Fraction	100	—	—	—	—	—	—	—	—	<200	—
>TPH C_{16} – C_{34} Fraction	100	—	—	—	—	—	—	—	—	<200	—
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	—	—	—	—	<200	—
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	—	—	—	—	<200	—

Notes:

13. All results reported in µg/L.
14. LOR = laboratory limit of reporting.
15. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, and boxed= in excess of trade waste guidelines.
16. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels);
17.
18. [b] = guideline taken from NHMRC and ARMCANZ (2004, 2011) Australian drinking water guidelines for health; # indicates aesthetic criteria adopted from NHMRC and ARMCANZ (2004, 2011).
19. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
20. [d] = guidelines taken from City West Water (2011) Standards for trade waste discharge to the sewer system.
21. [e] =toluene and ethylbenzene values taken from low reliability values for marine ecosystems presented in Table 8.3.14 of ANZECC (2000); * =guidelines taken from Netherlands (1994) intervention values.
22. — = guideline not available or analysis not undertaken.
23. USEPA SW 846-8270D = sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).
24. USEPA SW 846-8260B = water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).

TABLE 17 ORGANIC GROUNDWATER RESULTS SUMMARY – NORTH EAST WELLS

Analyte	LOR	Guidelines				GW7	GW8	GW26	GW27	GW28	GW29	GW30	GW37	GW38	DUP2	SPLIT2
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	2/05/11	19/04/11	2/05/11	20/04/11	19/04/11	18/04/11	19/04/11	19/04/11	19/04/11	19/04/11	19/04/11
Oxygenated Compounds																
2-Butanone (MEK)	50	—	—	—	—	<50	<50	<50	<50	<50	<50	<50	<50	<50	—	—
Polynuclear Aromatic Hydrocarbons (PAH)																
Naphthalene (via USEPA SW 846-8270D – see notes)	1	70	—	—	—	9.1	14.2	<1.0	<1.0	<1.0	<1.0	<1.0	27.8	20.6	<1	<0.2
Naphthalene (via USEPA SW 846-8260B – see notes)	5	—	—	—	—	<5	18	<5	<5	<5	<5	<5	40	28	<1	<0.2
Acenaphthylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Acenaphthene	1	—	—	—	—	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.7	<1.0	<1	<0.2
Fluorene	1	—	—	—	—	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Phenanthrene	1	2	—	—	—	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Anthracene	1	0.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Fluoranthene	1	1.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Benz(a)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Chrysene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Benzo(b)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Benzo(k)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Benzo(a)pyrene	0.5	0.2	0.01	*0.2*	—	<0.5	<0.5	<0.5	<0.6	<0.5	<0.5	<0.5	<0.6	<0.5	<0.5	<0.2
Indeno(1.2.3.cd)pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Dibenz(a.h)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Benzo(g.h.i)perylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<0.2
Sum of PAH	0.5	—	—	—	—	13.6	14.2	<1.0	<1.1	<1.0	<1.0	<1.0	33.5	20.6	<1	<2
Monocyclic Aromatic Hydrocarbons																
Styrene	5	—	30	—	2,000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.5
1.2.4-Trimethylbenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.5
BTEX																
Benzene	1	700	1	*1*	1,000	<1	*13*	<1	<1	<1	<1	<1	*42*	*27*	<1	<0.5
Toluene	2	180	800	—	2,000	<2	4	<2	<2	<2	<2	<2	12	10	<2	<0.5
Ethylbenzene	2	5	300	—	2,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.5
meta- & para-Xylene	2	—	—	—	—	<2	2	<2	<2	<2	<2	<2	5	4	<2	<1
ortho-Xylene	2	—	—	—	—	<2	2	<2	<2	<2	<2	<2	3	3	<2	<0.5
Total Xylenes	2	—	600	*20*[b#]	2,000	<2	4	<2	<2	<2	<2	<2	8	7	<2	<1.5
Sum of BTEX	1	—	—	—	—	<1	21	<1	<1	<1	<1	<1	62	44	<0.001	-

TABLE 17 ORGANIC GROUNDWATER RESULTS SUMMARY – NORTH EAST WELLS (CONTINUED)

Analyte	LOR	Guidelines				GW7	GW8	GW26	GW27	GW28	GW29	GW30	GW37	GW38	DUP2	SPLIT2
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	2/05/11	19/04/11	2/05/11	20/04/11	19/04/11	18/04/11	19/04/11	19/04/2011	19/04/11	19/04/11	19/04/11
Total Petroleum Hydrocarbons (TPH)																
TPH C_6 - C_9 Fraction	20	150*	150*	—	1,000	<20	20	<20	<20	<20	<20	<20	60	40	<20	<20
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	<50	510	<50	<50	<50	<50	<50	610	3370	<50	<50
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	220	1,110	170	280	<100	<100	<100	1330	1850	<100	260
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	60	90	80	190	<50	<50	<50	60	130	<50	<50
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	280	1,710	250	470	<50	<50	<50	2,000	5,350	<50	310
Total Recoverable Hydrocarbons (TRH)																
TRH C_6 – C_{10} Fraction	20	—	—	—	—	<20	20	<20	<20	<20	<20	<20	60	40	<0.02	—
TRH C_6 – C_{10} Fraction minus BTEX	20	—	—	—	—	<20	<20	<20	<20	<20	<20	<20	<20	<20	<0.02	—
>TRH C_{10} – C_{16} Fraction	100	—	—	—	—	<100	680	<100	<100	<100	<100	<100	880	3590	<0.1	—
>TRH C_{16} – C_{34} Fraction	100	—	—	—	—	230	980	210	380	<100	<100	<100	1110	1580	<0.1	—
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	<100	<100	<100	100	<100	<100	<100	<100	<100	<0.1	—
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	230	1660	210	480	<100	<100	<100	1990	5170	<100	—
TPH Speciation																
TPH Aromatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	300	480	—	—
TPH Aromatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	<100	200	—	—
TPH Aromatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	<50	—	—
TPH Aliphatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	<50	—	—
TPH Aliphatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	<100	<100	—	—
TPH Aliphatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	<50	—	—
TPH - Silica gel cleanup																
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	—	160	—	<50	—	—	—	410	1090	—	—
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	120	210	—	—
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	—	<50	—	<50	—	—	—	<50	<50	—	—
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	—	160	—	<50	—	—	—	530	1,300	—	—
Total Recoverable Hydrocarbons (TRH) – Silica Gel Cleanup																
>TPH C_{10} - C_{16} Fraction	100	—	—	—	—	—	200	—	<100	—	—	—	440	1090	—	—
>TPH C_{16} – C_{34} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	<100	170	—	—
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	—	<100	—	<100	—	—	—	<100	<100	—	—
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	—	200	—	<100	—	—	—	440	1260	—	—

Notes:
All results reported in µg/L.
LOR = laboratory limit of reporting.
shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, and boxed= in excess of trade waste guidelines.
[a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels);

[b] = guideline taken from NHMRC and ARMCANZ (2004, 2011) Australian drinking water guidelines for health; # indicates aesthetic criteria adopted from NHMRC and ARMCANZ (2004, 2011).
[c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
[d] = guidelines taken from City West Water (2011) Standards for trade waste discharge to the sewer system.
[e] =toluene and ethylbenzene values taken from low reliability values for marine ecosystems presented in Table 8.3.14 of ANZECC (2000); * =guidelines taken from Netherlands (1994) intervention values.
— = guideline not available or analysis not undertaken.
USEPA SW 846-8270D = sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).
USEPA SW 846-8260B = water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).

TABLE 18 ORGANIC GROUNDWATER RESULTS SUMMARY – SOUTH EAST WELLS

Analyte	LOR	Guidelines				GW9	GW10	GW11	GW12	GW13	GW14	GW15	GW16	GW25
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	19/04/11	20/04/11	20/04/11	19/04/11	20/04/11	20/04/11	20/04/11	20/04/11	20/04/11
Oxygenated Compounds														
2-Butanone (MEK)	50	—	—	—	—	<50	<50	<50	<50	<50	<50	<50	<50	<50
Polynuclear Aromatic Hydrocarbons (PAH)														
Naphthalene (via USEPA SW 846-8270D – see notes)	1	70	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene (via USEPA SW 846-8260B – see notes)	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	<5	6
Acenaphthylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	1	2	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	1	0.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	1	1.4	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	0.5	0.2	0.01	*0.01*	—	<0.6	<0.6	<0.6	<0.5	<0.5	<0.6	<0.6	<0.6	<0.6
Indeno(1.2.3.cd)pyrene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	1	—	—	—	—	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of PAH	0.5	—	—	—	—	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2
Monocyclic Aromatic Hydrocarbons														
Styrene	5	—	30	—	2,000	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	5	—	—	—	—	<5	<5	<5	<5	<5	<5	<5	<5	<5
BTEX														
Benzene	1	700	1	*1*	1,000	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	2	180	800	—	2,000	<2	<2	<2	<2	<2	<2	<2	<2	<2
Ethylbenzene	2	5	300	—	2,000	<2	<2	<2	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	2	—	—	—	—	<2	<2	<2	<2	<2	<2	<2	<2	<2
ortho-Xylene	2	—	—	—	—	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total Xylenes	2	—	600	*20*[b#]	2,000	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of BTEX	1	—	—	—	—	<1	<1	<1	<1	<1	<1	<1	<1	<1

TABLE 18 ORGANIC GROUNDWATER RESULTS SUMMARY – SOUTH EAST WELLS (CONTINUED)

Analyte	LOR	Guidelines				GW9	GW10	GW11	GW12	GW13	GW14	GW15	GW16	GW25
		Ecosystem[a]	Health[b]	*Recreation*[c]	Trade waste[d]	19/04/11	20/04/11	20/04/11	19/04/11	20/04/11	20/04/11	20/04/11	20/04/11	20/04/11
Total Petroleum Hydrocarbons (TPH)														
TPH C_6 - C_9 Fraction	20	150*	150*	—	1,000	<20	<20	<20	<20	<20	<20	<20	<20	<20
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	<100	<100	510	<100	<100	<100	230	<100	120
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	<50	60	260	50	<50	<50	<50	<50	70
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	<50	60	770	50	<50	<50	230	<50	190
Total Recoverable Hydrocarbons (TRH)														
TRH C_6 – C_{10} Fraction	20	—	—	—	—	<20	<20	<20	<20	<20	<20	<20	<20	<20
TRH C_6 – C_{10} Fraction minus BTEX	20	—	—	—	—	<20	<20	<20	<20	<20	<20	<20	<20	<20
>TRH C_{10} – C_{16} Fraction	100	—	—	—	—	<100	<100	<100	<100	<100	<100	<100	<100	<100
>TRH C_{16} – C_{34} Fraction	100	—	—	—	—	<100	130	670	<100	<100	<100	250	<100	160
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	<100	<100	120	<100	<100	<100	<100	<100	<100
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	<100	130	790	<100	<100	<100	250	<100	160
TPH Speciation														
TPH Aromatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH Aromatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	<100	—	<100
TPH Aromatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH Aliphatic C_{10}-C_{14} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH Aliphatic C_{15}-C_{28} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	<100	—	<100
TPH Aliphatic C_{29}-C_{36} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH - Silica gel cleanup														
TPH C_{10} - C_{14} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH C_{15} - C_{28} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	140	—	<100
TPH C_{29} - C_{36} Fraction	50	—	—	—	—	—	<50	<50	—	—	—	<50	—	<50
TPH C_{10} - C_{36} Fraction (sum)	50	600*	600*	—	—	—	<50	<50	—	—	—	140	—	<50
Total Recoverable Hydrocarbons (TRH) – Silica Gel Cleanup														
>TPH C_{10} - C_{16} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	<100	—	<100
>TPH C_{16} – C_{34} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	140	—	<100
>TPH C_{34} – C_{40} Fraction	100	—	—	—	—	—	<100	<100	—	—	—	<100	—	<100
>TPH C_{10} – C_{40} Fraction (sum)	100	—	—	—	—	—	<100	<100	—	—	—	140	—	<100

Notes:

1. All results reported in µg/L.
2. LOR = laboratory limit of reporting.
3. shaded = results in excess of ecosystem guidelines, highlighted = results in excess of health guidelines, *italics* = in excess of recreation guidelines, and boxed= in excess of trade waste guidelines.
4. [a]= guidelines taken from ANZECC/ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ecosystem criteria are for protection of 95 % of marine water species trigger levels);
5.
6. [b] = guideline taken from NHMRC and ARMCANZ (2004, 2011) Australian drinking water guidelines for health; # indicates aesthetic criteria adopted from NHMRC and ARMCANZ (2004, 2011).
7. [c] = recreational criteria based on drinking water health (not aesthetic) guidelines x 20 to allow for 2L/day consumption of drinking water and 100 mL incidental consumption per recreational swimming session.
8. [d] = guidelines taken from City West Water (2011) *Standards for trade waste discharge to the sewer system*.
9. [e] =toluene and ethylbenzene values taken from low reliability values for marine ecosystems presented in Table 8.3.14 of ANZECC (2000); * =guidelines taken from Netherlands (1994) intervention values.
10. — = guideline not available or analysis not undertaken.
11. USEPA SW 846-8270D = sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).
12. USEPA SW 846-8260B = water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3).

APPENDIX A GEOLOGICAL LOGS AND WELL CONSTRUCTION DETAILS

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW37**	**Logged by** SM
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger	**DATE DRILLED** 1 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Firm light grey /brown sandy CLAY							M1						No odour
NATURAL Yellow and grey fine grained SAND (Brighton Group Sediment)		1					W						Moisture encountered, possible pipe leakage
							M1						Cement
Yellow/grey sandy CLAY with medium plasticity		2											50 mm ID PVC casing, 125 mm hole
		3											
White-yellow, fine grained sandy CLAY with medium plasticity		4					D						
		5											
		6					M1						Bentonite
Fine gray CLAY with some yellow mottles, medium-high plasticity with minor sand lenses		7					M1						Moisture encountered at 6.5 mBGL Sand Strong hydrocarbon odour
		8											Screen - 50 mm ID PVC
Black/blue, medium coarse SAND with some clay		9					W						
		10											
		11											EOH @ 11.0 mBGL
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW38**	**Logged by** SF
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger	**DATE DRILLED** 28/2/11		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Gasworks waste		1											
NATURAL Gray, stiff, CLAY, high plasticity with minor sand lenses and minor orange mottling		2					D						
Increased mottling		3					DM						cement. 50 mm ID PVC casing, 125mm hole
		4											
		5					DM						Bentonite
		6					M						
		7											Sand. Screen - 50 mm ID PVC
Dark grey, fine SAND with minor clay Some black staining		8					MS						
		9											Odour
		10											EOH @ 10 mBGL
		11											
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW39**	**Logged by** SM
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger	**DATE DRILLED** 1 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Firm dark brown, loose clayey SILT with brick fragments							D						
							D						
Red yellow, CLAY of low plasticity		1					D						
Dark brown, loose clayey SILT													No odour detected through out stratigraphy
NATURAL Yellow gray, medium coarse SAND with clay lenses		2											
		3											Cement. 50 mm ID PVC casing, 125mm hole
Blue-gray, medium coarse SAND with some clay lenses		4											
Light brown, medium-coarse grained clayey SAND		5											Bentonite
		6					M1						A layer of small rocks
													Some moisture
		7	■										Sand
Light brown, medium-high plasticity, CLAYwith some sand lenses		8											
													Screen - 50 mm ID PVC
Black, medium dense SAND with clay lenses		9					W						No odour
		10											
		11											EOH @ 11.5 mBGL
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW40**	**Logged by** SM
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger	**DATE DRILLED** 28 February 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Lilydale topping							D						No odour
Firm, light brown, SAND with some sub angular gravels							D						Slight hydrocarbon odour
Firm-stiff, yellow SAND with coarse gravels		1											50 mm ID PVC casing, 125mm hole
Dark brown SILT with sub angular gravel, coke, ash and clinker		2											
NATURAL Brown, hard, SAND heavily cemented.		3											Cement
Red, fine-medium grained SAND with minor fine gravel		4											
		5											Bentonite
		6					M1						
		7											Sand
Yellow, fine grained SAND with minor Clay inclusions		8					W						Screen - 50 mm ID PVC
		9											
		10											EOH @ 10.5 mBGL
		11											
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW41**	**Logged by** SM
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Hollow Flight	**DATE DRILLED** 28/2/11		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Brown loose, SILT with coarse gravel							D						No odour, Hand augered to 0.6 mBGL
Ligth brown loose sandy SILT, with coarse gravels, clinker and coke			■				D						No odour
Grey/light brown, loose, silty SAND with gravels, bricks and yellow and grey clay nodules		1											50 mm ID PVC casing, 125 mm hole
Black, loose, gasworks waste with large gravels, brick fragments (ballast and slag fragments 10-20mm)		2											
NATURAL Gray, stiff, CLAY with trace orange mottling													
Tan/brown, fine SAND with minor clay		3					D						Grout
		4					D						
Gray, clayey SAND, fine gravels (3mm)		5					D						Bentonite
Orange/brown, soft, clayey SAND		6					M						Sand. Screen - 50 mm ID PVC
		7					M						
		8											EOH @ 7.0 mBGL
		9											
		10											
		11											
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW42D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ/SF
DRILL METHOD Solid Auger / Mud Rotary	**DATE DRILLED** 3 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Lilydale topping Firm, light brown SAND with some sub angular gravels Firm-stiff, yellow SAND with minor gravels Dark brown SILT with sub angular gravel, coke, ash and clinker		1											300 mm
NATURAL Fine grained, red/brown firm SAND with minor clay inclusions and gray mottling		2											250 mm (OD) 250 mm PVC Casing Mild hydrocarbon odour
		3											190 mm
		4											
		5											140 mm (OD) 125 mm (ID)
		6											
Gray/ brown fine grained SAND with minor clay		7											60 mm (OD) 50 mm (ID) Strong hydrocarbon odour
		8											Groundwater encountered
Green/black fine grained SAND		9					M2						
Light brown medium-fine grained SAND		10	■				M1		30.1				
		11	■						21.2				
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW42D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ/SF
DRILL METHOD Solid Auger / Mud Rotary	**DATE DRILLED** 3 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
		13											Bentonite No odour
		14											
Gray, firm, medium grained SAND, minor clay content		15											Slotted 50 mm ID PVC screen 0.4 mm slots
		16											
Weathered CLAY, basalt chips		17											Hydrocarbon odour EOH @ 17.0 mBGL
		18											
		19											
		20											
		21											
		22											
		23											
		24											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW43D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger / Mud Rotary	**DATE DRILLED** 4 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Lilydale topping Light brown, firm, SAND, some sub angular gravels Yellow, SAND, firm-hard, coarse gravels Dark brown, SILT, subangular gravel, coke, ash and clinker		1 2											300 mm outer casing 250 mm (OD) Quick Set Concrete
NATURAL Yellow and gray, fine grained SAND. (Brighton Group sediment)		3 4 5					M1 D						250 mm PVC Casing PVC Casing 140 mm (OD) 125 mm (ID) Cemented grout (5 % bentonite)
Light brown/yellow, firm, fine grained SAND with minor silt inclusions		6 7					M1						Casing 60 mm (OD) 50 mm (ID)
Increase in gray colourations		8 9 10					M2						Groundwater encountered
Gray light brown, fine grained SAND		11 12					M2 M2						Mild sweet odour (hydrocarbon) Odour becoming faint with depth

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW43D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER 8 mBGL	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Solid Auger / Mud Rotary	**DATE DRILLED** 4 March 2011		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
		13											Bentonite
		14											No odour
		15											Filter Pack (16/30)
		16											Slotted 50 mm ID PVC screen 0.4 mm slots
Weathered CLAY with sand lenses													
Basalt chips		17											EOH @ 17.4 mBGL
		18											
		19											
		20											
		21											
		22											
		23											
		24											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW44D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Soild Auger / Mud Rotary	**DATE DRILLED**		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
Ground Surface		0											
FILL Brown, silty SAND, coke, ash inclusions. increase in balast inclusions, approximately 0.4							D						300 mm
							D						
Light brown, firm, sandy CLAY		1											
NATURAL Light gray/ brown firm, sandy CLAY, some orange mottles (Brighton Group)							M1						
		2					D						Sticky texture
		3					M1						Change to solid augers at 1.5 m
Becoming lighter in colour SAND with angular grain shaped quartz inclusions													250 mm PVC casing
		4											Grout
		5					M1						190 mm
Dark brown colour (fine grained clay inclusions)													Slight increase in moisture
Light gray, loose fine grained SAND		6											
							M1						
		7											
							M1						
		8					M2						Groundwater encountered
Gray, moist fine grained SAND with minor clay inclusions													140 mm (OD) 125 mm (ID)
		9											
		10											High TPH odour, saturated
													60 mm (OD) 50 mm (ID)
		11								3.6			Mild hydrocarbon odour
													Changed to mud rotary
		12											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

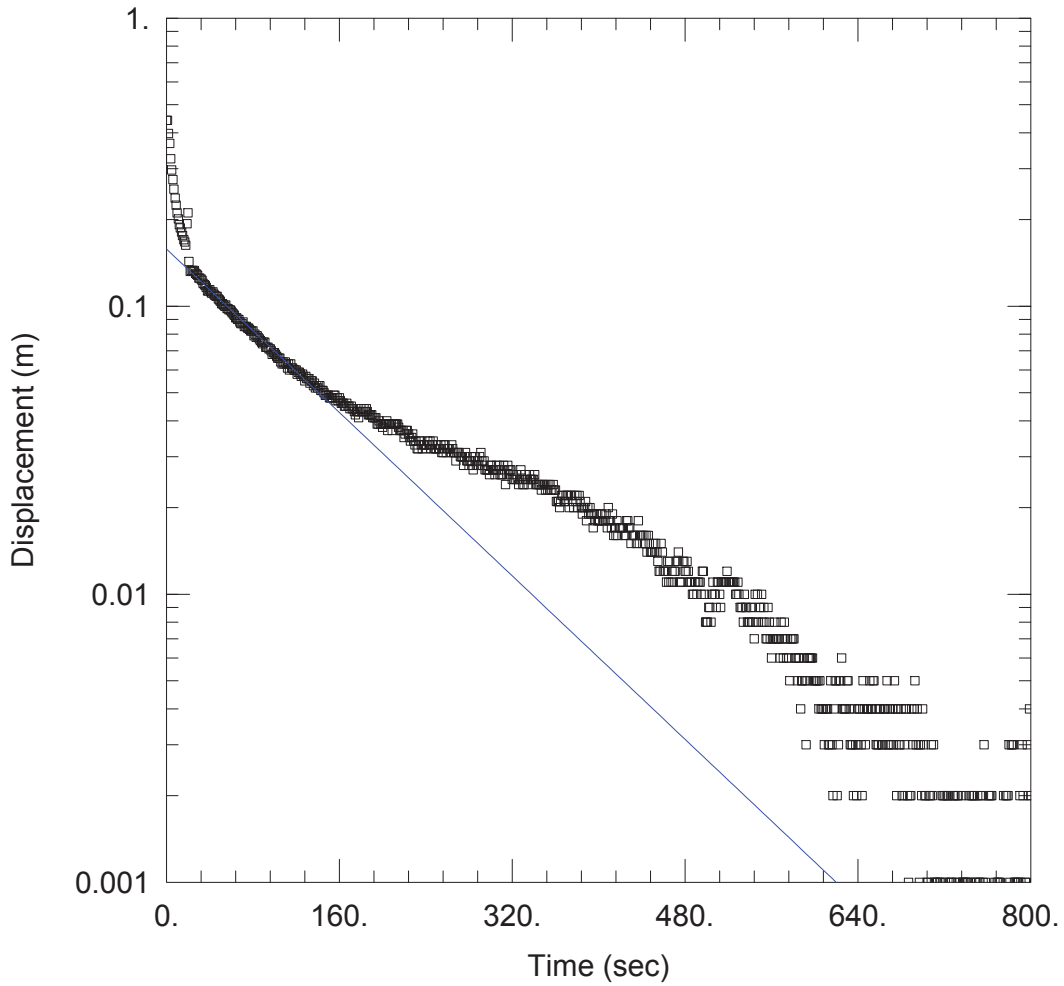
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

LOCATION X: **Y:**		**Borehole Log: GW44D**	**Logged by** DJ
SURFACE ELEVATION	**JOB NUMBER** 210074		
GROUNDWATER	**DATUM**	**PROJECT:** Sth Melbourne Gasworks	**Proj. Manager** DJ
DRILL METHOD Soild Auger / Mud Rotary	**DATE DRILLED**		

STRATIGRAPHY	GRAPHIC LOG	Depth metres	SAMPLES: Depth	Type	Lost	Duplicate	Moisture Content	PID/FID: Background	Reading	pH: pH - soil	pH - water	Construction Details	Comments
		13								2-1			Bentonite
		14											Sand
Soft-firm, saturated gray CLAY with minor sand and minor orange mottling		15											Slotted 50 mm screen 0.4 mm slots
		16											Pressure build up in hole, mud coming out of the top. Augers were withdrawn and re inserted
with 5% gravels. Gravels include basalt chips, appoximately 10mm angular.		17											Odours in cuttings distinctive
		18											EOH @ 18.0 mBGL
		19											
		20											
		21											
		22											
		23											
		24											

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

APPENDIX B SLUG TEST ANALYSES



WELL TEST ANALYSIS

Data Set: N:\...\210074 - GW40 BR 'rising'.aqt
Date: 10/30/12 Time: 17:29:58

PROJECT INFORMATION

Project: 210074
Test Well: GW40

AQUIFER DATA

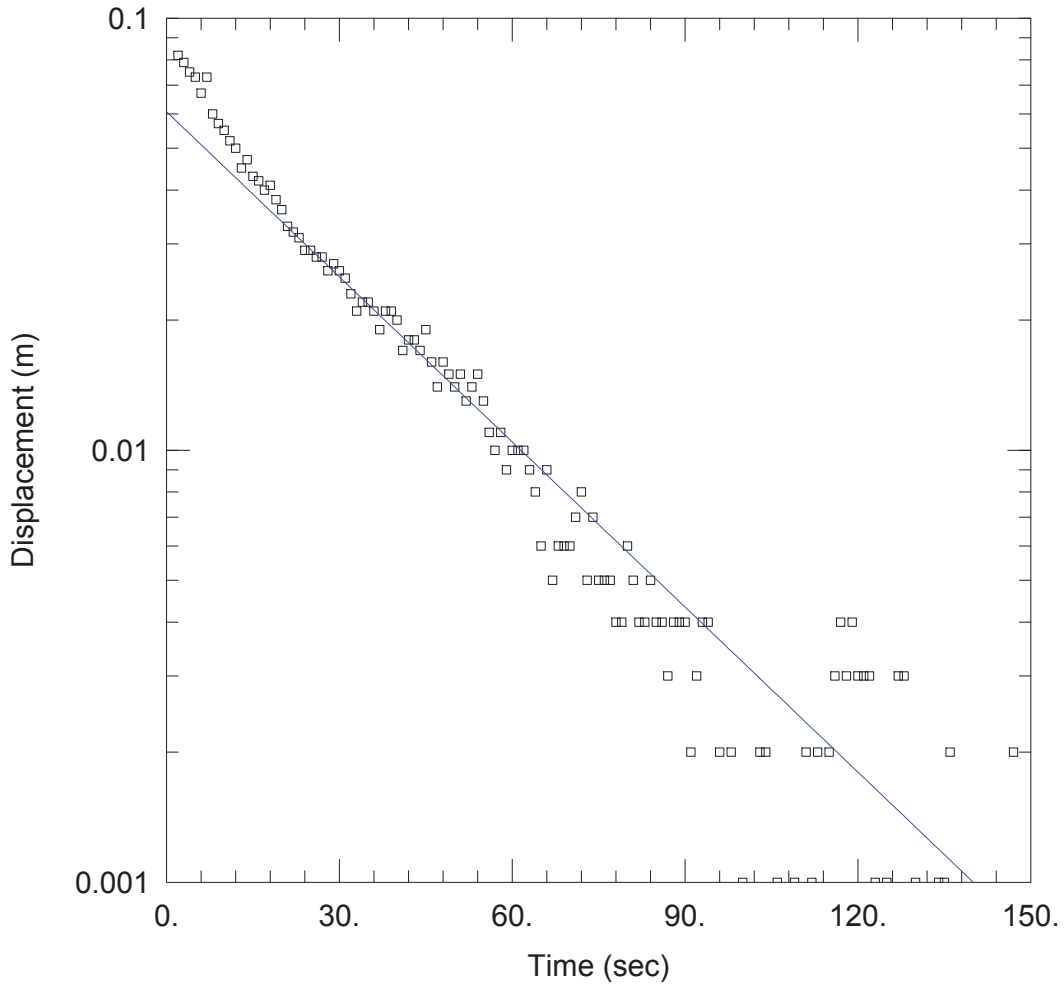
Saturated Thickness: 2.82 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GW40)

Initial Displacement: 0.442 m
Total Well Penetration Depth: 2.82 m
Casing Radius: 0.025 m
Static Water Column Height: 2.82 m
Screen Length: 2.82 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.2847 m/day
y0 = 0.1579 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 gw30 BouwerRice 'Rising' AW.aqt
Date: 10/30/12 Time: 17:28:06

PROJECT INFORMATION

Project: 210074
Test Well: GW30

AQUIFER DATA

Saturated Thickness: 1.5 m Anisotropy Ratio (Kz/Kr): 1.

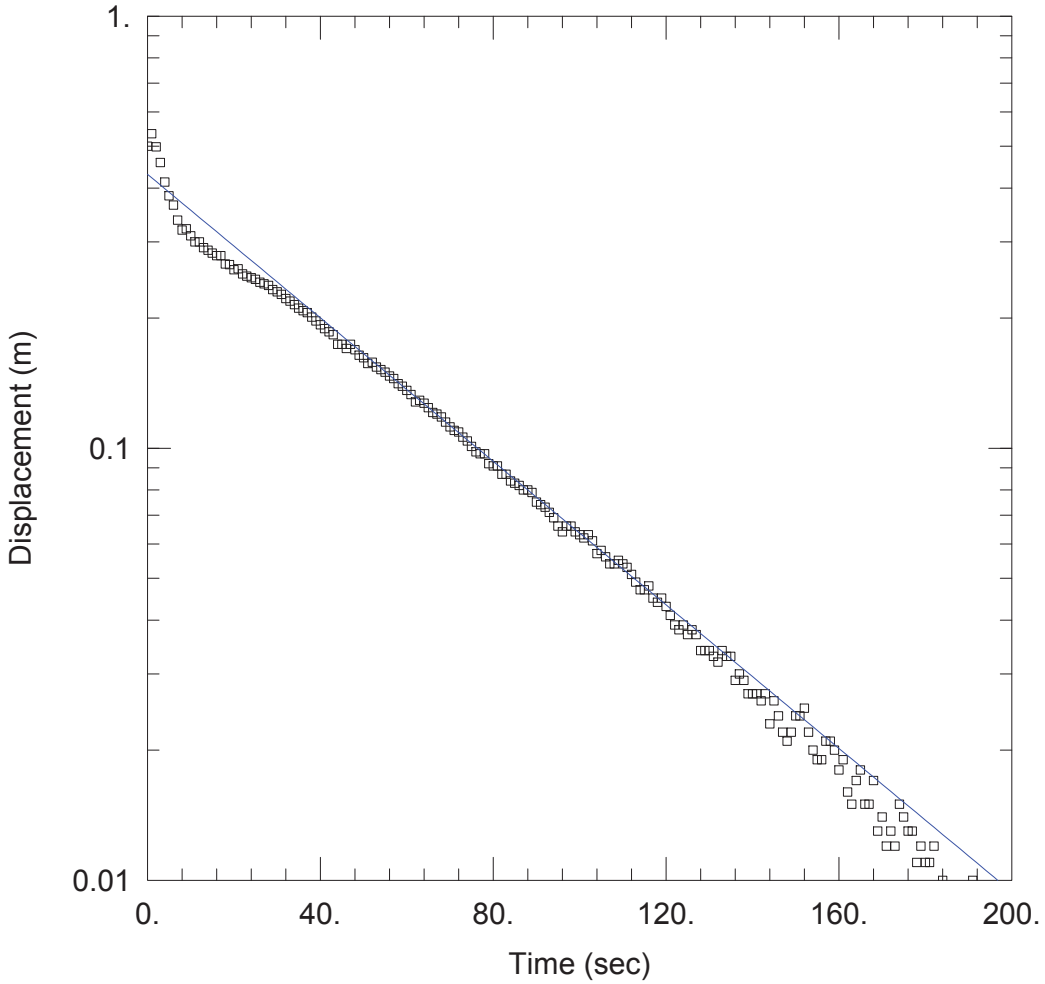
WELL DATA (GW30)

Initial Displacement: 1.5 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.025 m
Static Water Column Height: 1.5 m
Screen Length: 1.5 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.658 m/day
y0 = 0.06071 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 gw37 BouwerRice 'Rising' AW.aqt
Date: 10/30/12 Time: 17:29:26

PROJECT INFORMATION

Project: 210074
Test Well: GW37

AQUIFER DATA

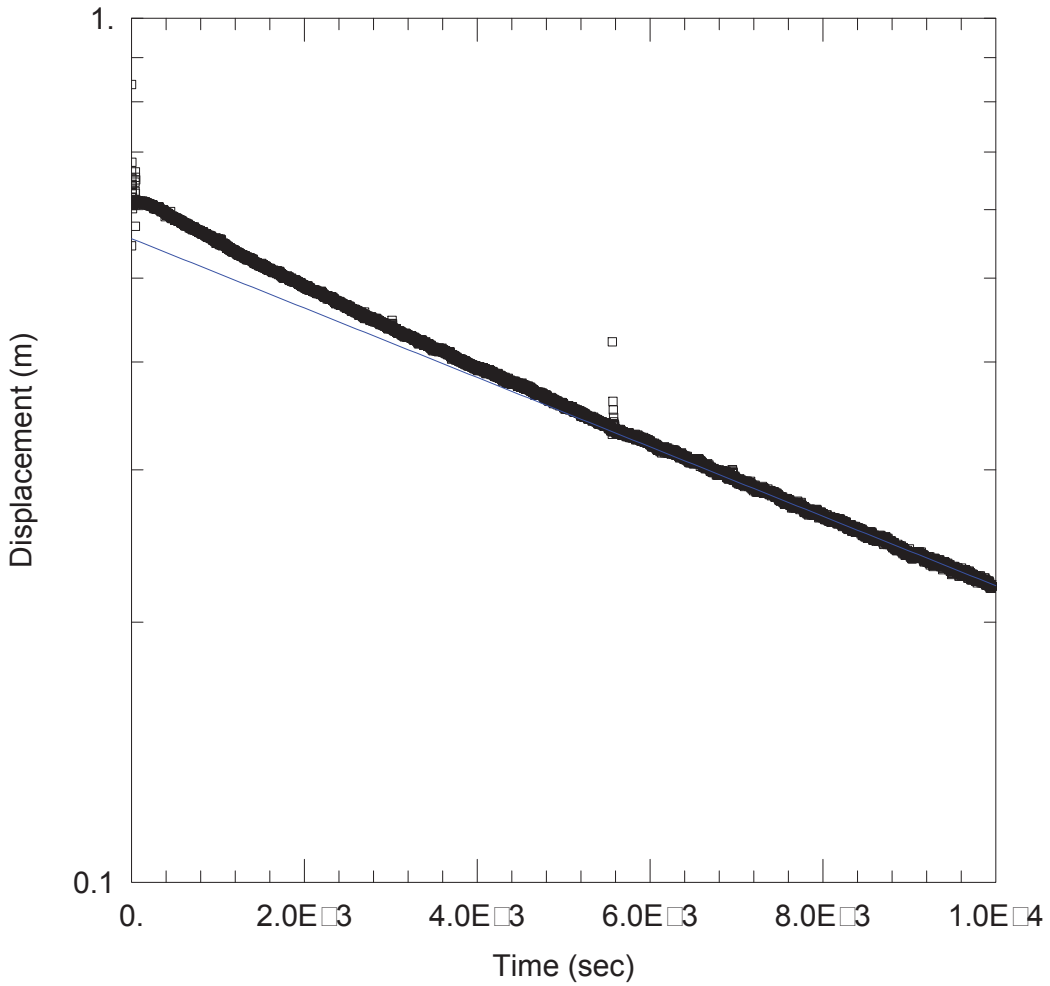
Saturated Thickness: 2.81 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GW37)

Initial Displacement: 0.5 m
Total Well Penetration Depth: 2.81 m
Casing Radius: 0.025 m
Static Water Column Height: 2.81 m
Screen Length: 2.81 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.6684 m/day
y0 = 0.4302 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW42 BR 'falling' AW.aqt
Date: 10/30/12 Time: 17:30:23

PROJECT INFORMATION

Project: 210074
Test Well: GW42D

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

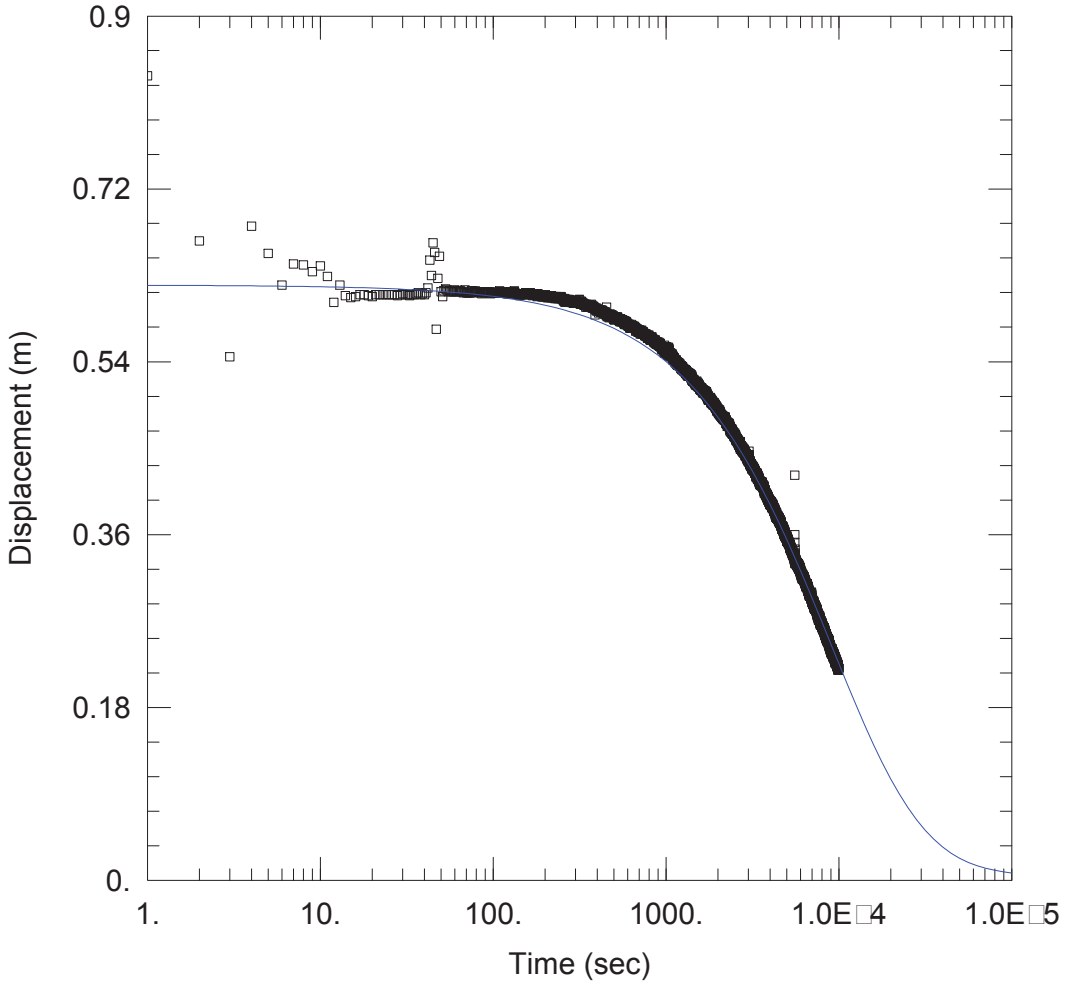
WELL DATA (New Well)

Initial Displacement: 0.62 m
Total Well Penetration Depth: 16.8 m
Casing Radius: 0.025 m
Static Water Column Height: 7.62 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.003962 m/day
y0 = 0.5556 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW42 CBP 'falling' AW.aqt
Date: 10/30/12 Time: 17:30:47

PROJECT INFORMATION

Project: 210074
Test Well: GW42D

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

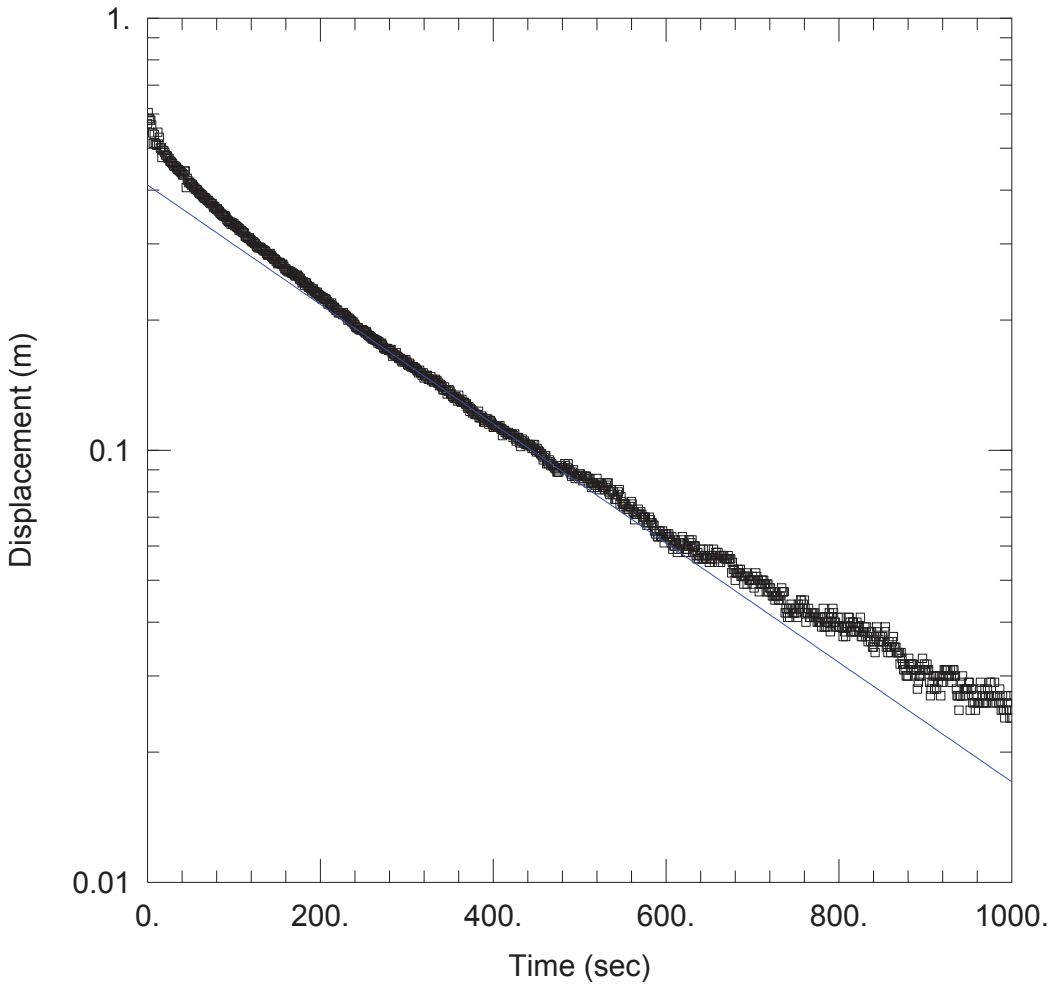
WELL DATA (New Well)

Initial Displacement: 0.62 m
Total Well Penetration Depth: 16.8 m
Casing Radius: 0.025 m
Static Water Column Height: 7.62 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.01464 m^2/day
S = 0.0001



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW44 BR falling AW.aqt
Date: 10/30/12 Time: 17:31:29

PROJECT INFORMATION

Project: 210074
Test Well: GW44

AQUIFER DATA

Saturated Thickness: 4.2 m Anisotropy Ratio (Kz/Kr): 1.

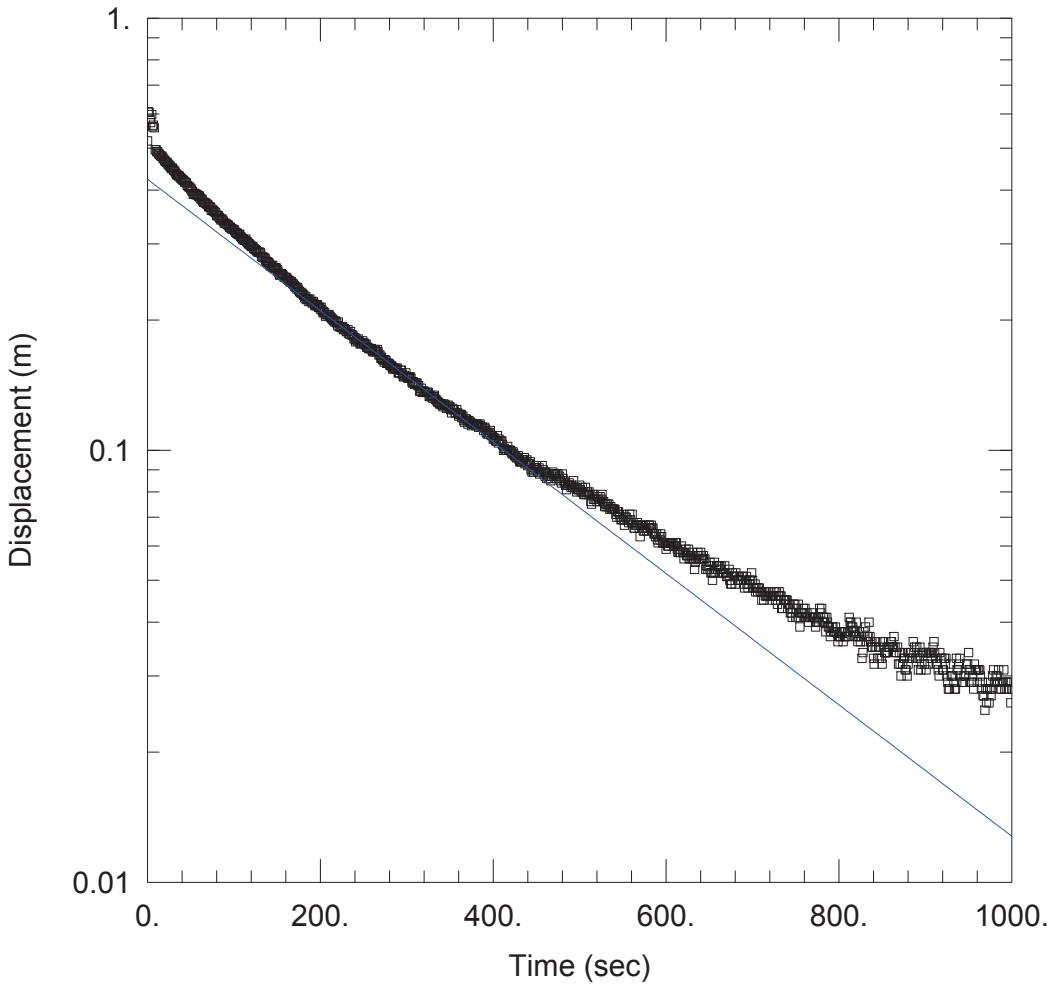
WELL DATA (New Well)

Initial Displacement: 0.57 m
Total Well Penetration Depth: 10.18 m
Casing Radius: 0.025 m
Static Water Column Height: 8.98 m
Screen Length: 4.2 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.09297 m/day
y0 = 0.4109 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW44 BR rising AW.aqt
Date: 10/30/12 Time: 17:31:49

PROJECT INFORMATION

Project: 210074
Test Well: GW44

AQUIFER DATA

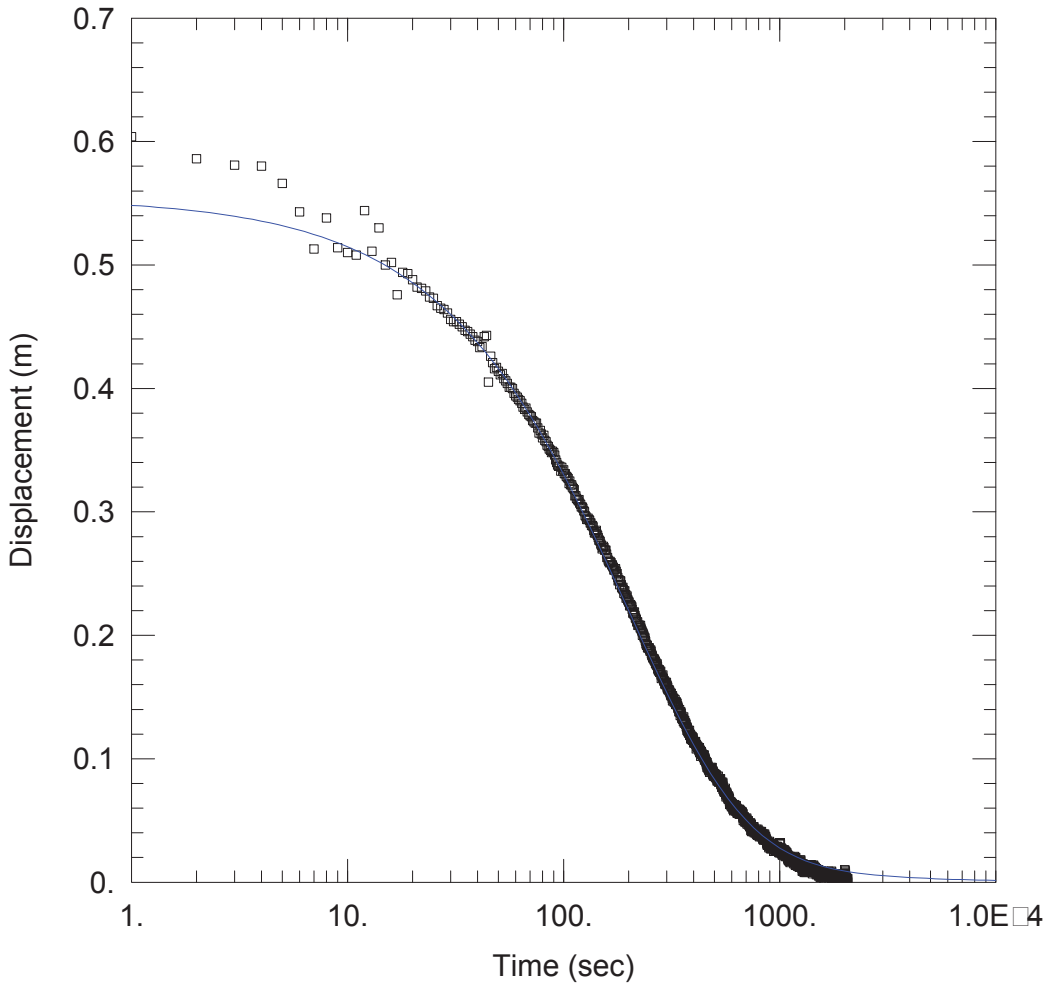
Saturated Thickness: 4.2 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.52 m
Total Well Penetration Depth: 10.18 m
Casing Radius: 0.025 m
Static Water Column Height: 8.98 m
Screen Length: 4.2 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.1023 m/day
y0 = 0.4234 m



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW44 CBP falling AW.aqt
Date: 10/30/12 Time: 17:32:07

PROJECT INFORMATION

Project: 210074
Test Well: GW44

AQUIFER DATA

Saturated Thickness: 4.2 m Anisotropy Ratio (Kz/Kr): 1.

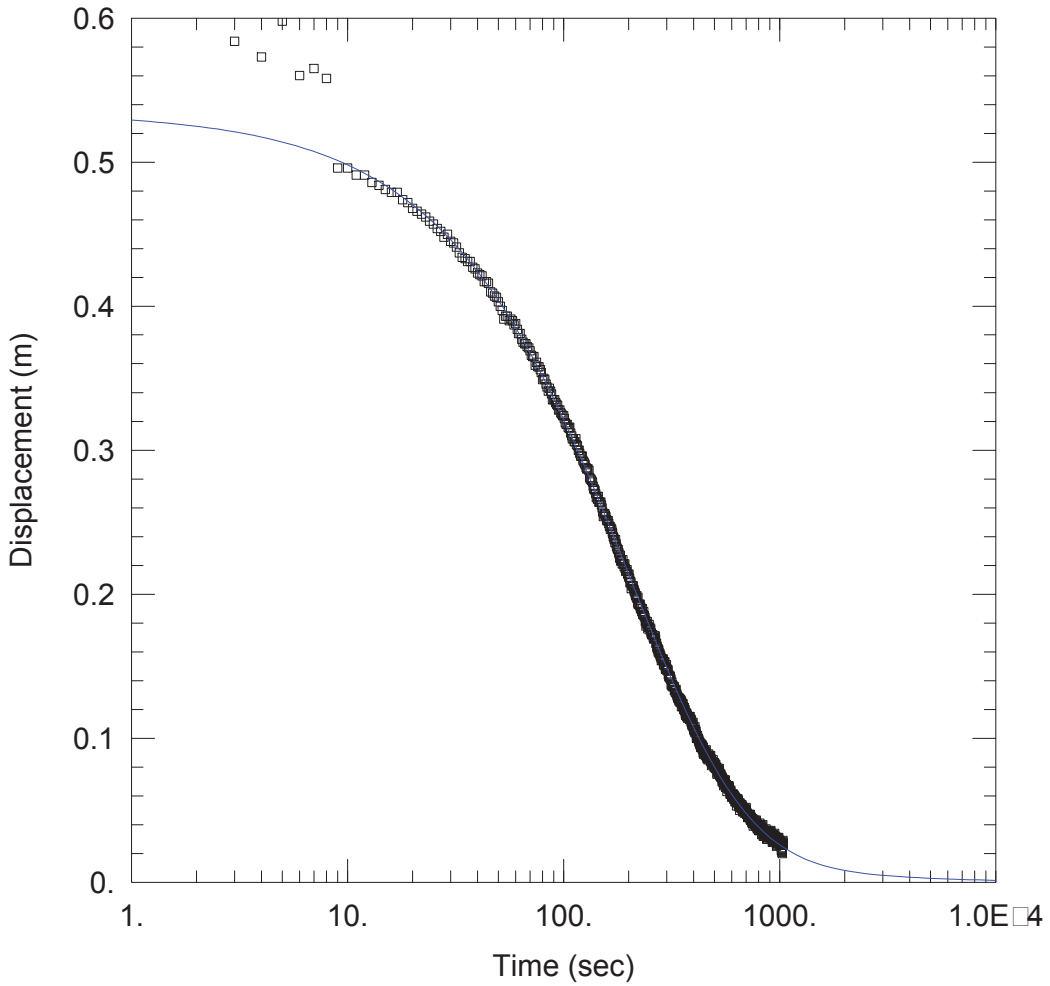
WELL DATA (New Well)

Initial Displacement: 0.555 m
Total Well Penetration Depth: 10.18 m
Casing Radius: 0.025 m
Static Water Column Height: 8.98 m
Screen Length: 4.2 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.5659 m^2/day
S = 0.0004058



WELL TEST ANALYSIS

Data Set: N:\...\210074 GW44 CBP rising AW.aqt
Date: 10/30/12 Time: 17:32:25

PROJECT INFORMATION

Project: 210074
Test Well: GW44

AQUIFER DATA

Saturated Thickness: 4.2 m Anisotropy Ratio (Kz/Kr): 1.

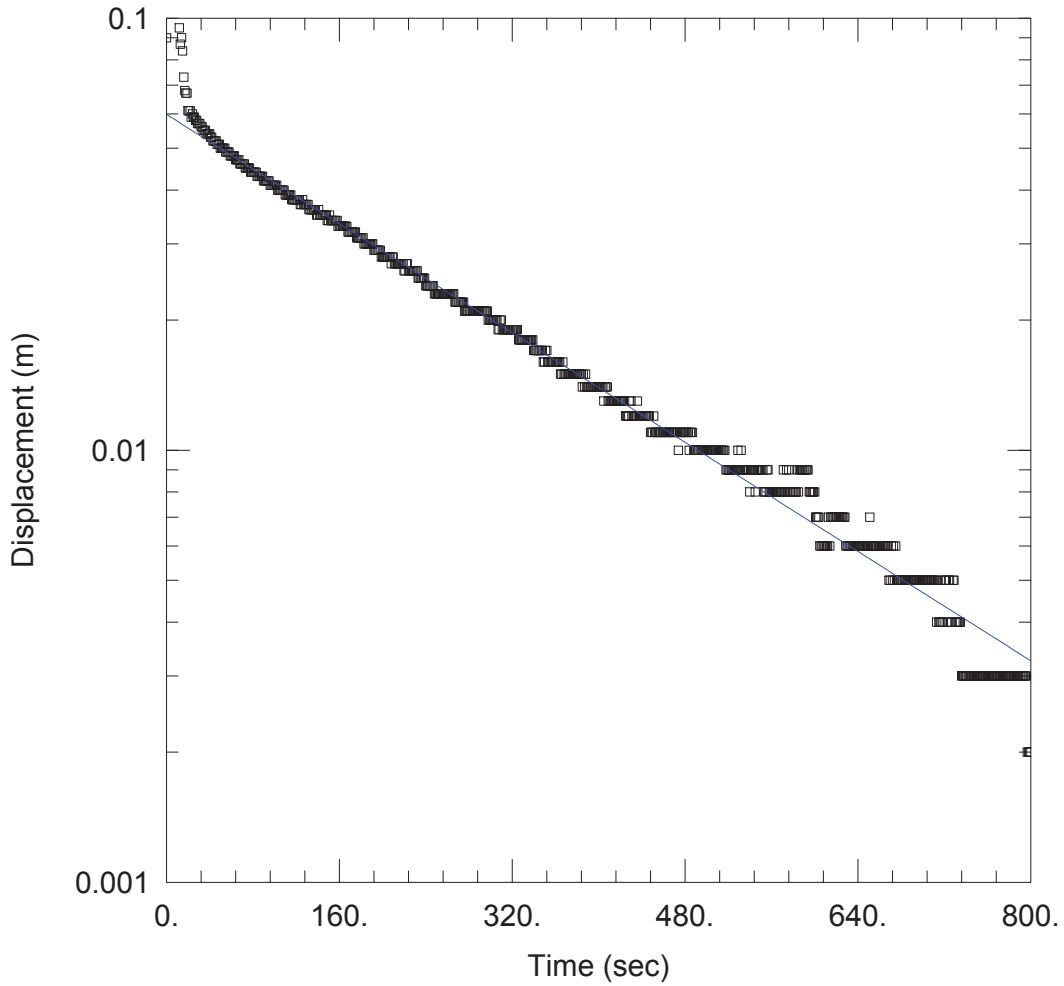
WELL DATA (New Well)

Initial Displacement: 0.535 m
Total Well Penetration Depth: 10.18 m
Casing Radius: 0.025 m
Static Water Column Height: 8.98 m
Screen Length: 4.2 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

T = 0.6013 m^2/day
S = 0.0002188



WELL TEST ANALYSIS

Data Set: N:\...\210074 gw7 BouwerRice 'Rising' AW.aqt
Date: 10/30/12 Time: 17:27:23

PROJECT INFORMATION

Project: 210074
Test Well: GW7

AQUIFER DATA

Saturated Thickness: 2.5 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (GW7)

Initial Displacement: 0.09 m
Total Well Penetration Depth: 2.5 m
Casing Radius: 0.025 m
Static Water Column Height: 2.5 m
Screen Length: 2.5 m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.1393 m/day
y0 = 0.05986 m

APPENDIX C LABORATORY TRANSCRIPTS AND CHAIN OF CUSTODY FORMS

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104104**	Page	: 1 of 13
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 18-APR-2011
Sampler	: ----	Issue Date	: 30-MAY-2011
Site	: ----		
		No. of samples received	: 7
Quote number	: ME/015/11 V3	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Valda Chen	QC Officer	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **30/5/11: This report has been amended and re-released to allow the reporting of additional analytical data.**
- **EP075(SIM): Insufficient sample provided to confirm matrix spike analysis.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	GW1	GW31	GW33	GW34	GW35
Client sample ID				GW1	GW31	GW33	GW34	GW35
Client sampling date / time				18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00
				EM1104104-001	EM1104104-002	EM1104104-003	EM1104104-004	EM1104104-005
EA005: pH								
pH Value	----	0.01	pH Unit	7.17	7.06	7.39	7.52	7.18
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	2780	1440	3480	3010	6450
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	584	242	314	45	532
Total Alkalinity as CaCO3	----	1	mg/L	584	242	314	45	532
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	120	227	1930	1440	503
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	1040	550	1050	243	3400
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	196	42	379	30	98
Magnesium	7439-95-4	1	mg/L	210	51	383	54	205
Sodium	7440-23-5	1	mg/L	400	454	672	776	2490
Potassium	7440-09-7	1	mg/L	53	49	168	42	43
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.04	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.051	0.272	0.010	0.396	0.286
Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.002	<0.001	0.005	0.002	0.002
Copper	7440-50-8	0.001	mg/L	0.005	0.002	0.006	0.003	0.002
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.197	0.083	0.320	0.021	0.792
Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.006	0.003	0.007
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.024	0.016	0.012	<0.005	0.014
Boron	7440-42-8	0.05	mg/L	1.30	2.65	3.38	6.88	1.39
Iron	7439-89-6	0.05	mg/L	<0.05	0.06	<0.05	0.10	0.09
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	0.012	<0.004	<0.004	0.005	<0.004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	GW1	GW31	GW33	GW34	GW35
Client sample ID				GW1	GW31	GW33	GW34	GW35
Client sampling date / time				18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00
				EM1104104-001	EM1104104-002	EM1104104-003	EM1104104-004	EM1104104-005
EK026G: Total Cyanide By Discrete Analyser - Continued								
Total Cyanide	57-12-5	0.004	mg/L	**0.016**	**0.118**	**0.058**	**0.240**	**0.039**
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	**0.014**	<0.004	**0.007**	**0.010**	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**1.3**	**3.1**	**1.2**	**0.2**	**1.8**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**1.43**	**10.4**	**8.43**	**0.41**	**4.25**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	**0.10**	**0.03**	**0.02**	**0.04**	**0.01**
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14797-55-8	0.01	mg/L	**0.39**	**1.37**	**4.11**	**0.07**	**0.01**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.49**	**1.40**	**4.13**	**0.11**	**0.02**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	**0.01**	<0.01	**0.11**	<0.01
EK085M: Sulfide as S2-								
Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EN055: Ionic Balance								
^ Total Anions	----	0.01	meq/L	**43.6**	**25.1**	**76.1**	**37.8**	**117**
^ Total Cations	----	0.01	meq/L	**45.9**	**27.3**	**83.9**	**40.8**	**131**
^ Ionic Balance	----	0.01	%	**2.57**	**4.17**	**4.90**	**3.78**	**5.73**
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW1	GW31	GW33	GW34	GW35
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00
Compound	CAS Number	LOR	Unit		EM1104104-001	EM1104104-002	EM1104104-003	EM1104104-004	EM1104104-005
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	<5	<5	<5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW1	GW31	GW33	GW34	GW35
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00
Compound	CAS Number	LOR	Unit		EM1104104-001	EM1104104-002	EM1104104-003	EM1104104-004	EM1104104-005
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.6	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	---	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	---	100	µg/L		**270**	<100	<100	<100	**280**
C29 - C36 Fraction	---	50	µg/L		**60**	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	---	50	µg/L		**330**	<50	<50	<50	**280**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µg/L		<20	<20	<20	<20	<20

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW1	GW31	GW33	GW34	GW35
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00	18-APR-2011 15:00
Compound	CAS Number	LOR	Unit		EM1104104-001	EM1104104-002	EM1104104-003	EM1104104-004	EM1104104-005
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		**290**	<100	<100	<100	**240**
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**290**	<100	<100	<100	**240**
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**118**	**121**	**119**	**108**	**115**
Toluene-D8	2037-26-5	0.1	%		**112**	**113**	**111**	**109**	**110**
4-Bromofluorobenzene	460-00-4	0.1	%		**112**	**110**	**114**	**105**	**108**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**26.3**	**22.6**	**28.5**	**36.9**	**32.5**
2-Chlorophenol-D4	93951-73-6	0.1	%		**58.3**	**51.9**	**64.4**	**82.4**	**80.5**
2.4.6-Tribromophenol	118-79-6	0.1	%		**74.7**	**92.6**	**108**	**93.4**	**96.7**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**57.8**	**77.2**	**90.0**	**87.7**	**86.1**
Anthracene-d10	1719-06-8	0.1	%		**76.4**	**84.1**	**97.1**	**95.0**	**95.0**
4-Terphenyl-d14	1718-51-0	0.1	%		**80.1**	**86.0**	**102**	**104**	**94.6**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**117**	**118**	**103**	**106**	**113**
Toluene-D8	2037-26-5	0.1	%		**107**	**107**	**95.0**	**104**	**105**
4-Bromofluorobenzene	460-00-4	0.1	%		**108**	**108**	**95.8**	**103**	**105**

Analytical Results

Sub-Matrix: WATER			Client sample ID	GW6	TRIP 1	----	----	----
			Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EM1104104-006	EM1104104-007	----	----	----
EA005: pH								
pH Value	----	0.01	pH Unit	**6.97**	----	----	----	----
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	**1190**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**262**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**262**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**72**	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	**466**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**44**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**51**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**247**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**17**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.002**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.018**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.004**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.010**	----	----	----	----
Boron	7440-42-8	0.05	mg/L	**1.54**	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	----	----	----	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	**0.006**	----	----	----	----
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW6	TRIP 1	----	----	----
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1104104-006	EM1104104-007	----	----	----
EK026G: Total Cyanide By Discrete Analyser - Continued									
Total Cyanide	57-12-5	0.004	mg/L		**0.006**	----	----	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	----	0.004	mg/L		**0.007**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.3**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.43**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		**0.01**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14797-55-8	0.01	mg/L		**0.89**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.90**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	----	----	----	----
EK085M: Sulfide as S2-									
Sulfide as S2-	18496-25-8	0.1	mg/L		<0.1	----	----	----	----
EN055: Ionic Balance									
^ Total Anions	----	0.01	meq/L		**19.9**	----	----	----	----
^ Total Cations	----	0.01	meq/L		**17.5**	----	----	----	----
^ Ionic Balance	----	0.01	%		**6.26**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	<50	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW6	TRIP 1	----	----	----
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1104104-006	EM1104104-007	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	<5	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	<5	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW6	TRIP 1	----	----	----
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1104104-006	EM1104104-007	----	----	----
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	108-86-1	5	µg/L		<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L		<5	<5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		<20	<20	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	GW6	TRIP 1	----	----	----
				Client sampling date / time	18-APR-2011 15:00	18-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EM1104104-006	EM1104104-007	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**114**	**112**	----	----	----
Toluene-D8	2037-26-5	0.1	%		**109**	**108**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**104**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**24.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**56.5**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**67.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**53.5**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**64.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**71.6**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**112**	**110**	----	----	----
Toluene-D8	2037-26-5	0.1	%		**105**	**103**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**104**	**100**	----	----	----

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	74	128
4-Bromofluorobenzene	460-00-4	70	132
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	58
2-Chlorophenol-D4	93951-73-6	10	124
2.4.6-Tribromophenol	118-79-6	26	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	32	122
Anthracene-d10	1719-06-8	34	136
4-Terphenyl-d14	1718-51-0	34	140
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	131
Toluene-D8	2037-26-5	72	124
4-Bromofluorobenzene	460-00-4	70	126

Amended COC rec'd 18/4/11 5:30 Peter

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Environmental Earth Sciences	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: P.O.BOX 2253, FOOTSCRAY , VIC, 3011	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: 210074 ALBERT PARK GAS WORKS	ALS QUOTE NO.: ME/015/11 V3	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) CO 1 2 3 4 5	Random Sample Temperature on Receipt: 3.8 - 4.2 °C
PROJECT MANAGER: DAVID JAMES — CONTACT PH: 0403 033 796	OI 1 2 3 4 5	Other comment:
SAMPLER: — SAMPLER MOBILE: 0437 033 796	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default): ENMRG & ESDAT	DATE/TIME: 18/4/2011 3:30pm	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):	RELINQUISHED BY:	RECEIVED BY: Rani
Email Invoice to (will default to PM if no other addresses are listed):	DATE/TIME:	DATE/TIME: 18/4/11 4.40 pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH, TDS, Free Cyanide, Total cyanide, WAD cyanide, Sulphide	NT-1 package - Ca, Mg, Na, K	NT-2 Package - Cl, SO4, Alk	NT-3 Package - NO2, NO3, Fl, Reactive P	NH4 - Ammonium - (field pH and field temperature must be recorded)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B, Mn & Hg (lab to centrifuge, filter and acidify from red/green metals bottle)	Hexavalent Chromium	W-10 Package - TPH/BTEX/PAH Plus VOC		Sample Ph	Sample Temp	
1	GW1	18/04/2011			8	x	x	x	x	x	x	x	x		7.01	21.20	
2	GW31	18/04/2011			8	x	x	x	x	x	x	x	x		7.09	19.30	
3	GW33	18/04/2011			8	x	x	x	x	x	x	x	x		7.27	19.55	
4	GW34	18/04/2011			8	x	x	x	x	x	x	x	x		7.67	20.60	
5	GW35	18/04/2011			8	x	x	x	x	x	x	x	x		7.27	19.90	
6	GW6	18/04/2011			8	x	x	x	x	x	x	x	x		6.97	20.00	
7	Trip 1	18/04/2011	(extra sample)										X	→	W-9	Package as per Carol Walsh (BN) 19/4	
				TOTAL	48	6	6	6	6	6	6		6				

Environmental Division Melbourne
Work Order
EM1104104

Telephone : +61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1104104**	Page	: 1 of 16
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 18-APR-2011
Sampler	: ----	Issue Date	: 30-MAY-2011
Order number	: ----		
		No. of samples received	: 7
Quote number	: ME/015/11 V3	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Valda Chen	QC Officer	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pH (QC Lot: 1757178)									
EM1104076-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	7.49	7.50	0.1	0% - 20%
EM1104104-006	GW6	EA005: pH Value	---	0.01	pH Unit	6.97	6.95	0.3	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 1757856)									
EM1104102-001	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	904	934	3.3	0% - 20%
EM1104125-001	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	7950	6640	18.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 1759595)									
EM1104076-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	487	490	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	487	490	0.7	0% - 20%
EM1104104-003	GW33	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	314	318	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	314	318	1.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 1755291)									
EM1104042-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	28	27	0.0	0% - 20%
EM1104100-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	250	251	0.0	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 1756866)									
EM1104077-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	1	0.0	No Limit
EM1104100-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1120	1110	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 1756865)									
EM1104077-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EM1104100-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	26	28	5.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	69	74	7.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	983	987	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	17	9.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1762449)									
EM1104086-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.020	0.020	0.0	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.002	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1762449) - continued									
EM1104086-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.155	0.154	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.025	0.025	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.011	0.012	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.49	0.51	3.2	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM1104104-005	GW35	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.286	0.280	2.2	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.792	0.761	4.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.007	0.006	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.014	0.014	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.39	1.36	1.6	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.09	0.05	52.7	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1762448)									
EM1104086-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM1104104-005	GW35	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG050F: Dissolved Hexavalent Chromium (QC Lot: 1758097)									
EM1103957-037	Anonymous	EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1104059-002	Anonymous	EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1764418)									
EM1104104-001	GW1	EK025G: Free Cyanide	---	0.004	mg/L	0.012	<0.004	101	No Limit
EM1104129-004	Anonymous	EK025G: Free Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1762777)									
EM1104102-003	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104127-003	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	0.010	<0.004	88.5	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1757156)									
EM1104102-002	Anonymous	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104142-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 1759596)									
EM1104077-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM1104104-003	GW33	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.2	1.2	0.0	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1759210)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1759210) - continued									
EM1104077-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1104104-001	GW1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.43	1.40	2.1	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1756864)									
EM1104055-005	Anonymous	EK057G: Nitrite as N	---	0.01	mg/L	0.04	0.04	0.0	No Limit
EM1104100-001	Anonymous	EK057G: Nitrite as N	---	0.01	mg/L	0.75	0.75	0.0	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1759209)									
EM1104069-001	Anonymous	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	4.47	4.37	2.4	0% - 20%
EM1104102-002	Anonymous	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 1756868)									
EM1104100-001	Anonymous	EK071G: Reactive Phosphorus as P	---	0.01	mg/L	12.0	11.9	0.6	0% - 20%
EM1104108-003	Anonymous	EK071G: Reactive Phosphorus as P	---	0.01	mg/L	<0.01	0.02	0.0	No Limit
EK085M: Sulfide as S2- (QC Lot: 1757090)									
EM1104042-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EM1104104-006	GW6	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074B: Oxygenated Compounds (QC Lot: 1762083) - continued									
EM1104104-006	GW6	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 1762083) - continued									
EM1104104-001	GW1	EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EM1104104-006	GW6	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074F: Halogenated Aromatic Compounds (QC Lot: 1762083) - continued									
EM1104104-001	GW1	EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 1762083)									
EM1104104-001	GW1	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1758261)									
EM1104104-001	GW1	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.6	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1758261) - continued									
EM1104104-001	GW1	EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1758260)									
EM1104104-001	GW1	EP071: C15 - C28 Fraction	---	100	µg/L	270	220	20.1	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	60	60	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1759318)									
EM1104127-002	Anonymous	EP071: C15 - C28 Fraction	---	100	µg/L	160	280	57.1	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	60	120	55.6	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1762082)									
EM1104104-001	GW1	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EM1104104-006	GW6	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1758260)									
EM1104104-001	GW1	EP071: >C10 - C16 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	---	100	µg/L	290	260	13.3	No Limit
		EP071: >C34 - C40 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1759318)									
EM1104127-002	Anonymous	EP071: >C10 - C16 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	---	100	µg/L	180	340	58.4	No Limit
		EP071: >C34 - C40 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1762082)									
EM1104104-001	GW1	EP080: C6 - C10 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EM1104104-006	GW6	EP080: C6 - C10 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1762082)									
EM1104104-001	GW1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM1104104-006	GW6	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids (QCLot: 1757856)								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	<5	2000 mg/L	103	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 1759595)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.5	77	127
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1755291)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	12.5 mg/L	114	81	125
ED045G: Chloride Discrete analyser (QCLot: 1756866)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.2	89	117
ED093F: Dissolved Major Cations (QCLot: 1756865)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	85.4	81	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	112	80	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	80.4	78	124
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	79.6	79	121
EG020F: Dissolved Metals by ICP-MS (QCLot: 1762449)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.4	80	120
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.0	87	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	88	110
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	100	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.5	86	108
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	90	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.6	87	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.0	83	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86	120
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	91.0	61	133
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.5	79	119
EG035F: Dissolved Mercury by FIMS (QCLot: 1762448)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	92.5	71	125
EG050F: Dissolved Hexavalent Chromium (QCLot: 1758097)								
EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.5 mg/L	88.0	80	120
EK025G: Free cyanide by Discrete Analyser (QCLot: 1764418)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.5 mg/L	75.4	73	111
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1762777)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	114	85	125

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1757156)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.5 mg/L	71.0	64	104
EK040P: Fluoride by PC Titrator (QCLot: 1759596)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	101	78	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1759210)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	99.1	76	122
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1756864)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	88.0	84	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1759209)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	73	127
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1756868)								
EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	92.0	84	108
EK085M: Sulfide as S2- (QCLot: 1757090)								
EK085: Sulfide as S2-	18496-25-8	0.10	mg/L	<0.1	0.5 mg/L	91.0	82	116
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1762083)								
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	105	74	122
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	111	80	120
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	101	70	120
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	102	71	119
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	105	72	120
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	104	73	119
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	103	73	119
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	101	71	121
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	98.9	65	121
EP074B: Oxygenated Compounds (QCLot: 1762083)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	200 µg/L	97.5	57	131
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	200 µg/L	100	69	135
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	200 µg/L	124	68	136
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	200 µg/L	110	68	138
EP074C: Sulfonated Compounds (QCLot: 1762083)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	20 µg/L	99.6	67	127
EP074D: Fumigants (QCLot: 1762083)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	94.8	59	128
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	114	77	121
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	99.1	70	118
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	94.6	66	120
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	114	78	124
EP074E: Halogenated Aliphatic Compounds (QCLot: 1762083)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 1762083) - continued								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	112	58	148
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	111	62	142
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	# 59.6	61	141
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	107	57	131
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	105	64	138
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	106	67	131
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	109	71	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	113	61	135
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	112	75	121
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	113	77	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	114	78	122
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	108	70	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	# 122	74	122
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	100	57	123
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	116	75	125
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	110	77	121
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	112	76	122
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	117	78	126
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	119	79	125
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	113	76	122
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	102	65	119
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	99.0	46	126
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	76.1	54	132
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	122	75	131
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	118	75	133
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	87.9	46	118
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	92.3	54	124
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	90.6	50	134
EP074F: Halogenated Aromatic Compounds (QCLot: 1762083)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	113	81	121
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	108	75	119
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	103	73	121
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	102	72	120
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	106	73	119
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	99.5	74	120
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	106	78	118
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	95.0	56	128
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	102	69	123
EP074G: Trihalomethanes (QCLot: 1762083)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074G: Trihalomethanes (QCLot: 1762083) - continued								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	110	77	121
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	102	69	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	94.8	59	119
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	83.8	49	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1758261)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.5	27.5	124
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	69.6	35	129
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	70.7	35	127
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	70.9	36	130
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	78.0	42	132
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	77.7	42	132
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	76.8	41	141
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	79.3	40	142
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	71.6	33	153
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	88.1	37	145
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	76.2	35	151
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	70.8	39	141
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	74.4	41	139
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	82.5	35	141
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	83.7	36	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	83.4	10	142
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1759319)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	67.2	27.5	124
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	66.5	35	129
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	69.4	35	127
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	70.4	36	130
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	76.0	42	132
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.1	42	132
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	74.2	41	141
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	77.4	40	142
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	72.6	33	153
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	77.8	37	145
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	78.8	35	151
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	76.2	39	141
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	77.7	41	139
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	77.8	35	141
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	77.7	36	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	78.5	10	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1758260)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1758260) - continued								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	5440 µg/L	122	64	124
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17824 µg/L	109	70	130
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3694 µg/L	113	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1759318)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	5440 µg/L	91.6	64	124
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17824 µg/L	83.6	70	130
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3694 µg/L	84.4	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1762082)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	87.1	72	136
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1766090)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
EP071: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1758260)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	10320 µg/L	96.9	70	130
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	16640 µg/L	110	70	130
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1080 µg/L	128	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1759318)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	10320 µg/L	74.4	70	130
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	16640 µg/L	84.5	70	130
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1080 µg/L	81.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1762082)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	370 µg/L	87.4	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1766090)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN (QCLot: 1762082)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	96.6	73	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	96.1	74	128
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	91.6	72	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	96.3	69	133
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	98.2	74	128
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	114	70	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1755291)							
EM1104047-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 1756866)							
EM1104111-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	126	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 1762449)							
EM1104086-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	122	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	103	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	102	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	101	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	93.7	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	102	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	111	68	136
EG035F: Dissolved Mercury by FIMS (QCLot: 1762448)							
EM1104086-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	85.2	70	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 1758097)							
EM1103957-038	Anonymous	EG050F: Hexavalent Chromium	18540-29-9	0.5 mg/L	92.0	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1764418)							
EM1104104-002	GW31	EK025G: Free Cyanide	----	0.5 mg/L	94.4	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1762777)							
EM1104104-001	GW1	EK026G: Total Cyanide	57-12-5	0.2 mg/L	107	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1757156)							
EM1104102-003	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.5 mg/L	85.3	70	130
EK040P: Fluoride by PC Titrator (QCLot: 1759596)							
EM1104077-004	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	98.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1759210)							
EM1104077-004	Anonymous	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	125	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1756864)							
EM1104055-006	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	108	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1759209)							
EM1104076-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1756868)							
EM1104108-004	Anonymous	EK071G: Reactive Phosphorus as P	----	0.5 mg/L	104	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP074E: Halogenated Aliphatic Compounds (QCLot: 1762083)							
EM1104104-002	GW31	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	# 107	54	104
		EP074: Trichloroethene	79-01-6	20 µg/L	109	62	120
EP074F: Halogenated Aromatic Compounds (QCLot: 1762083)							
EM1104104-002	GW31	EP074: Chlorobenzene	108-90-7	20 µg/L	118	68	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1762082)							
EM1104104-002	GW31	EP080: C6 - C9 Fraction	----	280 µg/L	101	51	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1762082)							
EM1104104-002	GW31	EP080: C6 - C10 Fraction	----	330 µg/L	102	70	130
EP080: BTEXN (QCLot: 1762082)							
EM1104104-002	GW31	EP080: Benzene	71-43-2	20 µg/L	105	63	131
		EP080: Toluene	108-88-3	20 µg/L	99.7	65	133

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104104**	Page	: 1 of 13
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
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Project	: 210074 ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 18-APR-2011
Sampler	: ----	Issue Date	: 30-MAY-2011
Order number	: ----		
		No. of samples received	: 7
Quote number	: ME/015/11 V3	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**----**	----	----	**20-APR-2011**	18-APR-2011	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**----**	----	----	**20-APR-2011**	25-APR-2011	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**---**	02-MAY-2011	----	**21-APR-2011**	02-MAY-2011	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**---**	16-MAY-2011	----	**27-APR-2011**	16-MAY-2011	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**---**	16-MAY-2011	----	**27-APR-2011**	16-MAY-2011	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**---**	16-MAY-2011	----	**21-APR-2011**	16-MAY-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	15-OCT-2011	----	**28-APR-2011**	15-OCT-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	16-MAY-2011	----	**28-APR-2011**	16-MAY-2011	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	----	----	----	**20-APR-2011**	16-MAY-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**28-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**27-APR-2011**	02-MAY-2011	✓
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	**20-APR-2011**	02-MAY-2011	✓	**20-APR-2011**	02-MAY-2011	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	16-MAY-2011	----	**21-APR-2011**	16-MAY-2011	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	16-MAY-2011	----	**28-APR-2011**	16-MAY-2011	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	20-APR-2011	----	**19-APR-2011**	20-APR-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	16-MAY-2011	----	**27-APR-2011**	16-MAY-2011	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	---	20-APR-2011	----	**19-APR-2011**	20-APR-2011	✓
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH							
GW1, GW31, GW33, GW34, GW35, GW6	**18-APR-2011**	----	----	----	**20-APR-2011**	25-APR-2011	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP074C: Sulfonated Compounds							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP074D: Fumigants							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial- NaHSO4 or H2SO4 GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP074G: Trihalomethanes							
Amber VOC Vial- NaHSO4 or H2SO4 GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved GW1, GW31, GW33	**18-APR-2011**	**20-APR-2011**	25-APR-2011	✓	**28-APR-2011**	30-MAY-2011	✓
Amber Glass Bottle - Unpreserved GW34, GW35, GW6	**18-APR-2011**	**21-APR-2011**	25-APR-2011	✓	**27-APR-2011**	31-MAY-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved GW1, GW31, GW33	**18-APR-2011**	**20-APR-2011**	25-APR-2011	✓	**28-APR-2011**	30-MAY-2011	✓
Amber Glass Bottle - Unpreserved GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**21-APR-2011**	25-APR-2011	✓	**27-APR-2011**	31-MAY-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved GW1, GW31, GW33	**18-APR-2011**	**20-APR-2011**	25-APR-2011	✓	**28-APR-2011**	30-MAY-2011	✓
Amber Glass Bottle - Unpreserved GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**21-APR-2011**	25-APR-2011	✓	**27-APR-2011**	31-MAY-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Amber VOC Vial- NaHSO4 or H2SO4							
GW1, GW31, GW33, GW34, GW35, GW6, TRIP 1	**18-APR-2011**	**27-APR-2011**	02-MAY-2011	✓	**28-APR-2011**	02-MAY-2011	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	**9.1**	**10.0**	×	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	18	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	18	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	3	30	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Hexavalent Chromium - Dissolved	EG050F	WATER	APHA 21st ed., 3500 Cr-B. Samples are 0.45 um filtered prior to analysis. Hexavalent chromium is determined on filtered water sample as received by pH adjustment and colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide By Discrete Analyser	EK026G	WATER	APHA 21st ed., 4500-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500-NO3- F. Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfide as S2-	EK085	WATER	APHA 21st ed., 4500-S2- D Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. After the supernatant is discarded, the resultant precipitate is then coloured using methylene blue indicator and measured using UV-VIS detection at 664nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and ICPAES	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by ICPAES. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide	EK026-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP074E: Halogenated Aliphatic Compounds	2073992-011	----	**Vinyl chloride**	75-01-4	59.6 %	61-141%	**Recovery less than lower control limit**
EP074E: Halogenated Aliphatic Compounds	2073992-011	----	**1.1-Dichloropropylene**	563-58-6	122 %	74-122%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1104047-001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM1104076-001	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP074E: Halogenated Aliphatic Compounds	EM1104104-002	GW31	**1.1-Dichloroethene**	75-35-4	107 %	54-104%	**Recovery greater than upper data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: pH							
Clear Plastic Bottle - Natural							
GW1,	GW31,	---	----	----	20-APR-2011	18-APR-2011	**2**
GW33,	GW34,						
GW35,	GW6						

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	1	11	9.1	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104161**	gl : P	1of 3o1L
Amendment	: **1**		
i stPvy	**ENVIRONMENTAL EARTH SCIENCES**	bl r f tl yf tC	Evmtf vDPvyl sou mmenf vdMPsr f ctvP
i f vyl Ry	MAou Vl Ju dSVMEW	i f vyl Ry	i l tf sdh l sed
V. . tPee	g(B(XB2o55TL aBBYWl AV, d J ldVp WYAVbJVdL011	V. . tPee	4dh Peyl ssoA. dW7tnv: mi sPd J d/ceytl sh dL1- 1
EjDl ns	. (@DPez PPen(Dmv	EjDl ns	Rl tf sG-l sedz l sePvmtf (RfD
YPsP7df vP	6F1c9F8- 1FFF	YPsP7df vP	6F1jLj 8T49c9F08
al RenDnsP	6F1c0Lc9F8- 1844	al RenDnsP	6F1jLj 8T49c9F01
gtf @RRy	5100- 4d/bXEAYqgVAKdGVWh BAKW	Qi doPmPs	NEgMod1999odWRdP. csPoX(L)d v. d/bWdQi WLdtPqcmtPDPvy
Bt. PtovcDr Pt	jjjj		
i jBji ovcDr Pt	jjjj	ul yPdW D7sPeoAPRPmmP.	19jVgAj 5011
WlD7sPt	u S	JeecPou l yP	L0jMV, j5011
WhyP	jjjj		
		Nf (of 3oel D7sPedPRPmmP.	10
QcfyPovcDr Pt	ME/01T/11d L	Nf (of 3oel D7sPedvl sCeP.	10

Ydreo tP7f tyo ec7PteP. Peo l vCo 7tPmmf ceo tP7f ty(e)o + nydo ydreo tP3PtPvRPQi APecsyeo l 77sCo yf o ydPo el D7sP(e)o l eo ecr DnyyP. Qi Vsso 7l : Peo f 3o ydreo tP7f tyo dl mPo r PPvo RdPRkP. o l v. o l 77tf mP. o 3f t tPsPl ePQi

Ydreoi Ptyo3RlyPdf 3bVvl sCemedRf vyl nveoydPo3f ssf + nv: onv3f tDl yn f v

- GPvPtl soi f DDPvye
- Vvl sOynRl ssAPecsye
- Wcttf : l yPoi f vytf sdonDnye

NVYVd/RRtP. nyP. dol r f tl yf tCo85T
o
Ydreo f RcDPvyoreoeecP. onvo
l RRf t. l vRPo+ nydoNVYVo
l RRtP. nl yn f vdPqcmtPDPvyeO

VRRtP. nyP. o3f toRf D7sh vRPo+ nydo
JWB/JEi d-05TO

Signatories

Ydreo . f RcDPvyo dl eo r PPvo PsPRytf vnRl ssCo en vP. o r Co ydPo l cydf tnvP. o en vl yf tnPeo nv. nRl yP. o r Psf + Qi EsPRytf vnRo en vnv: o dl eo r PPv Rl ttnP. of cyonvdRf D7sh vRPo+ nydo7tf RP. ctPeoe7PR3tP. onvo51oi aAogl tyo1 1O

Signatories	*Position*	*Accreditation Category*
un sl vnoaPtvl v. f	WPvnf toVf t: l vnRoi dPDnrey	MPsr f ctvPoVf t: l vnRe
HPtDl vdonv	bl r f tl yf tCoi f f t. nvl yf t	MPsr f ctvPoVf t: l vnRe
Nl vRGdh l v:	WPvnf tdVPD mnf sl yrsPoVveytcDPvyoi dPDnrey	MPsr f ctvPoBt: l vnRe
2nv: r nvdonv	WPvnf toBt: l vnRoi dPDnrey	MPsr f ctvPoBt: l vnRe

gl : P	5of 3o1L
h f tkoBt. Pt	EM11041F1oV/DPv. DPvyol
i stPvy	ENl JABNMENYVbcEVAYHoW JENi EW
gtf @RRy	5100- 4oV/bXEAYqgVAKoGVWh BAKW

General Comments

YdPo l vl sOyRl so 7tf RP. ctPeo ceP. o r Co ydPo Evmtf vDPvyl so u mmenf vo dl mPo r PPvo . PmPsf 7P. o 3f Do Peyl r sredP. o nvyPtvl yfi vl sdCo tPRf : vnwP. o 7tf RP. ctPeo ecRdo l eo ydf ePo 7cr sredP. o r Co ydPo p WEg Vlo Vg HVlo VWo l v. o NEg MCo Jvo df ceP . PmPsf 7P. o7tf RP. ctPeo tPoPD 7sf CP. onvgdPo r ePvRPof 3o f RcDPvyP. oeyl v. l t. eof to r CoRsPvydPqcPeyO

h dPtPoD f neyctPo PyPtDnvl yfi vodl eo r PPvo7Pt3f tDP. lodPecsyed tPotP7f tyP. of vo o tCo+ Pn dyo r l eneO

h dPtPo dtP7f tyP. osPeegdl vo(<)dtPecsyoneodn dPtogdl vogdPdoBAUdydneoDl Co r Po cPgf o7tnDl tCoel D7sPoPxytl RyV. n PeyU yPo nscyfi vo v. /f to nvec3BfPvyoel D7sPo5f to vl sCeneO

h dPtPogdPdoBAof 3o dtP7f tyP. otPecsyo n8BPteo3f Doeyl v. l t. doBAUdydneoDl Co r Po cPgf o dn do Df neyctPoRf vyPvyUdnvec3BfRfPvyoel D7sPo(tP. cRP. o+ Pn dyoPD 7sf CP.)of to Dl ytnxonvyPt3PtPvRPO

h dPvoel D7sw: oyrDPonv3 tDl yfi vone o/f yo7tf mn P. o r CoydPdRstPvydel D7sw: o l yPedi tPoedf + vo+ nydf cyd o yrD PdRf D7f vPvyCoUvgdPePonveyl vRPeUdydPgyrD PdRf D7f vPvyodl eo r PPvd eecD P. o r CoydPos l r f tl yf tCo5f to7tf RPeenv: o7ct7f ePeO

KPCo i VWdNcDr Ptc=oi VWdtP: neytCo/cDr Ptc3f Do l yl r l ePdDl nvyl nvP. o r Coi dPDnRl sdVr eytl RyedWPtmnRPeCdYdPoi dPDnRl sdVr eytl RyedWPtmnRPoned o mmenf vof 3ydPdV/D PtnR voi dPDnRl sdWf RnPyCO
bBAc=donDnyof 3dP7f tyrv:
^c=oYdnedPecsyoneoRf D7cyP. o3f Dorv. mnn cl sdi vl sOyPo PyPRyfi ved yof to l r f mPgydPosPmPsof 3dP7f tyrv:

- **30/5/11: This report has been amended and re-released to allow the reporting of additional analytical data.**
- **Ionic Balance out of acceptable limits for EM1104161 #1 ,#2, #3, #6 and #10 due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia for EM1104161 #3 and #10..**
- **It is recognised that Nitrite + Nitrate is less than Nitrite as N for EM1104161 #4 and #7. However, the difference is within experimental variation of the methods.**

Analytical Results

Wcrj Ml ytnx: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW29	GW30	GW8	GW28	GW32
				Client sampling date / time: 18jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00
				EM1104161-001	EM1104161-002	EM1104161-003	EM1104161-004	EM1104161-005
EA005: pH								
pH Value	jjjj	0001	7Hqpvry	7.22	7.37	6.27	7.65	7.69
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GJWj510j010	T	D: /b	2450	3050	2740	1540	1310
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	uMBj510j001	1	D: /b	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	L815jL5jF	1	D: /b	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	-1jT5jL	1	D: /b	469	431	228	367	574
Total Alkalinity as CaCO3	jjjj	1	D: /b	469	431	228	367	574
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808j-9j8	1	D: /b	353	573	1510	167	216
ED045G: Chloride Discrete analyser								
Chloride	1F88-j00jF	1	D: /b	735	1020	290	332	41
ED093F: Dissolved Major Cations								
Calcium	-440j-0j5	1	D: /b	57	88	130	30	131
Magnesium	-4L9j9Tj4	1	D: /b	56	83	50	26	63
Sodium	-440j5LjT	1	D: /b	602	733	173	351	73
Potassium	-440j09j-	1	D: /b	7	7	8	6	30
EG020F: Dissolved Metals by ICP-MS								
Aluminium	-459j90jT	0001	D: /b	<0001	0.01	<0001	<0001	<0001
Arsenic	-440jL8j5	00001	D: /b	0.002	0.064	0.012	0.189	0.318
Cadmium	-440j4Lj9	000001	D: /b	<000001	<000001	<000001	<000001	<000001
Cobalt	-440j48j4	00001	D: /b	0.005	0.007	0.006	<00001	<00001
Copper	-440jT0j8	00001	D: /b	0.005	0.003	0.003	0.002	0.003
Lead	-4L9j95j1	00001	D: /b	0.002	0.010	0.001	0.003	<00001
Manganese	-4L9j9FjT	00001	D: /b	0.403	0.434	1.35	0.170	0.176
Nickel	-440j05j0	00001	D: /b	0.008	0.005	0.066	0.014	0.002
Selenium	--85j49j5	0001	D: /b	<0001	<0001	<0001	<0001	<0001
Zinc	-440jFFjF	0000T	D: /b	0.021	0.017	0.052	<0000T	0.006
Boron	-440j45j8	000T	D: /b	0.46	0.44	0.91	0.74	0.83
Iron	-4L9j89jF	000T	D: /b	<000T	<000T	3.50	<000T	0.06
EG035F: Dissolved Mercury by FIMS								
Mercury	-4L9j9-jF	000001	D: /b	<000001	<000001	<000001	<000001	<000001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18T40j59j9	0001	D: /b	<0001	<0001	<0001	<0001	<0001
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	jjjj	00004	D: /b	<00004	<00004	<00004	<00004	0.006
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

Wcrj Ml ytnx: WATER				Client sample ID	GW29	GW30	GW8	GW28	GW32
				Client sampling date / time	18jVgAj5011dlT 00	19jVgAj5011dlT 00	19jVgAj5011dlT 00	19jVgAj5011dlT 00	19jVgAj5011dlT 00
Compound	CAS Number	LOR	Unit		EM1104161-001	EM1104161-002	EM1104161-003	EM1104161-004	EM1104161-005
EK026G: Total Cyanide By Discrete Analyser - Continued									
Total Cyanide	T- j15jT	0D004	D: /b		<0D004	<0D004	0.014	0.033	0.226
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	jjjj	0D004	D: /b		<0D004	<0D004	<0D004	<0D004	0.007
EK040P: Fluoride by PC Titrator									
Fluoride	1F984j48j8	0D1	D: /b		0.8	1.6	0.2	1.4	2.3
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	- FF4j41j-	0D01	D: /b		0.10	0.44	318	76.3	12.5
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	jjjj	0D01	D: /b		0.09	0.15	0.05	0.01	0.02
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14- 9- jTTj8	0D01	D: /b		14.2	4.49	0.24	<0D01	1.67
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	jjjj	0D01	D: /b		14.3	4.64	0.28	<0D01	1.69
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	jjjj	0D01	D: /b		<0D01	<0D01	<0D01	<0D01	<0D01
EK085M: Sulfide as S2-									
Sulfide as S2-	1849Fj5Tj8	0D1	D: /b		<0D1	<0D1	<0D1	<0D1	<0D1
EN055: Ionic Balance									
^ Total Anions	jjjj	0D01	DPq/b		37.4	49.3	44.2	20.2	17.1
^ Total Cations	jjjj	0D01	DPq/b		33.8	43.3	jjjj	19.0	15.7
Total Cations	jjjj	0D01	DPq/b		jjjj	jjjj	35.4	jjjj	jjjj
^ Ionic Balance	jjjj	0D01	%		5.05	6.44	jjjj	3.05	4.24
Ionic Balance	jjjj	0D01	%		jjjj	jjjj	10.7	jjjj	jjjj
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100j45jT	T	µ: /b		<T	<T	<T	<T	<T
Isopropylbenzene	98j85j8	T	µ: /b		<T	<T	<T	<T	<T
n-Propylbenzene	10LjFTj1	T	µ: /b		<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	108jF- j8	T	µ: /b		<T	<T	<T	<T	<T
sec-Butylbenzene	1LTj98j8	T	µ: /b		<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	9TjFLjF	T	µ: /b		<T	<T	<T	<T	<T
tert-Butylbenzene	98j0FjF	T	µ: /b		<T	<T	<T	<T	<T
p-Isopropyltoluene	99j8- jF	T	µ: /b		<T	<T	<T	<T	<T
n-Butylbenzene	104jT1j8	T	µ: /b		<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds									
Vinyl Acetate	108j0Tj4	T0	µ: /b		<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	- 8j9LjL	T0	µ: /b		<T0	<T0	<T0	<T0	<T0

Analytical Results

Wcrj Ml ytnx: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW29	GW30	GW8	GW28	GW32
				Client sampling date / time: 18jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00
				EM1104161-001	EM1104161-002	EM1104161-003	EM1104161-004	EM1104161-005
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	108j10j1	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T91j-8jF	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	-Tj1Tj0	T	µ: /b	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T94j50j-	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dichloropropane	-8j8-jT	T	µ: /b	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100F1j01jT	T	µ: /b	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100F1j05jF	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10Fj9Lj4	T	µ: /b	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	-Tj-1j8	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Chloromethane	-4j8-jL	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	-Tj01j4	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Bromomethane	-4j8Lj9	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Chloroethane	-Tj00jL	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	-TjF9j4	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	-TjLTj4	T	µ: /b	<T	<T	<T	<T	<T
Iodomethane	-4j88j4	T	µ: /b	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1TFjF0jT	T	µ: /b	<T	<T	<T	<T	<T
1.1-Dichloroethane	-TjL4jL	T	µ: /b	<T	<T	<T	<T	<T
cis-1.2-Dichloroethene	1TFjT9j5	T	µ: /b	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	-1jTTjF	T	µ: /b	<T	<T	<T	<T	<T
1.1-Dichloropropylene	TFLjT8jF	T	µ: /b	<T	<T	<T	<T	<T
Carbon Tetrachloride	TFj5LjT	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dichloroethane	10-j0Fj5	T	µ: /b	<T	<T	<T	<T	<T
Trichloroethene	-9j01jF	T	µ: /b	<T	<T	<T	<T	<T
Dibromomethane	-4j9TjL	T	µ: /b	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	-9j00jT	T	µ: /b	<T	<T	<T	<T	<T
1.3-Dichloropropane	145j58j9	T	µ: /b	<T	<T	<T	<T	<T
Tetrachloroethene	15-j18j4	T	µ: /b	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	FL0j50jF	T	µ: /b	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110jT-jF	T	µ: /b	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14-Fj11jT	T	µ: /b	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	-9jL4jT	T	µ: /b	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	9Fj18j4	T	µ: /b	<T	<T	<T	<T	<T
Pentachloroethane	-Fj01j-	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	9Fj15j8	T	µ: /b	<T	<T	<T	<T	<T

Analytical Results

Wcrj Ml ytnx: WATER				Client sample ID	GW29	GW30	GW8	GW28	GW32
				Client sampling date / time	18jVgAj5011dT 00	19jVgAj5011dT 00	19jVgAj5011dT 00	19jVgAj5011dT 00	19jVgAj5011dT 00
Compound	*CAS Number*	*LOR*	*Unit*		**EM1104161-001**	**EM1104161-002**	**EM1104161-003**	**EM1104161-004**	**EM1104161-005**
EP074E: Halogenated Aliphatic Compounds - Continued									
Hexachlorobutadiene	8- jF8jL	T	µ: /b		<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108j90j-	T	µ: /b		<T	<T	<T	<T	<T
Bromobenzene	108j8Fj1	T	µ: /b		<T	<T	<T	<T	<T
2-Chlorotoluene	9Tj49j8	T	µ: /b		<T	<T	<T	<T	<T
4-Chlorotoluene	10Fj4Lj4	T	µ: /b		<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41j- Lj1	T	µ: /b		<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10Fj4Fj-	T	µ: /b		<T	<T	<T	<T	<T
1.2-Dichlorobenzene	9TjT0j1	T	µ: /b		<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	150j85j1	T	µ: /b		<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	8- jF1jF	T	µ: /b		<T	<T	<T	<T	<T
EP074G: Trihalomethanes									
Chloroform	F- jFFjL	T	µ: /b		<T	<T	<T	<T	<T
Bromodichloromethane	- Tj5- j4	T	µ: /b		<T	<T	<T	<T	<T
Dibromochloromethane	154j48j1	T	µ: /b		<T	<T	<T	<T	<T
Bromoform	- Tj5Tj5	T	µ: /b		<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91j50jL	10	µ: /b		<10	<10	**14.2**	<10	<10
Acenaphthylene	508j9Fj8	10	µ: /b		<10	<10	<10	<10	<10
Acenaphthene	8LjL5j9	10	µ: /b		<10	<10	<10	<10	<10
Fluorene	8Fj- Lj-	10	µ: /b		<10	<10	<10	<10	<10
Phenanthrene	8Tj01j8	10	µ: /b		<10	<10	<10	<10	<10
Anthracene	150j15j-	10	µ: /b		<10	<10	<10	<10	<10
Fluoranthene	50Fj44j0	10	µ: /b		<10	<10	<10	<10	<10
Pyrene	159j00j0	10	µ: /b		<10	<10	<10	<10	<10
Benz(a)anthracene	TFjTTjL	10	µ: /b		<10	<10	<10	<10	<10
Chrysene	518j01j9	10	µ: /b		<10	<10	<10	<10	<10
Benzo(b)fluoranthene	50Tj99j5	10	µ: /b		<10	<10	<10	<10	<10
Benzo(k)fluoranthene	50- j08j9	10	µ: /b		<10	<10	<10	<10	<10
Benzo(a)pyrene	T0jL5j8	0C	µ: /b		<0C	<0C	<0C	<0C	<0C
Indeno(1.2.3.cd)pyrene	19LjL9jT	10	µ: /b		<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	TLj- 0jL	10	µ: /b		<10	<10	<10	<10	<10
Benzo(g.h.i)perylene	191j54j5	10	µ: /b		<10	<10	<10	<10	<10
^ Sum of polycyclic aromatic hydrocarbons	jjjj	0C	µ: /b		<10	<10	**14.2**	<10	<10
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	jjjj	50	µ: /b		<50	<50	**20**	<50	<50
C10 - C14 Fraction	jjjj	T0	µ: /b		<T0	<T0	**510**	<T0	<T0

Analytical Results

Wcrj Ml ytnx: **WATER**

			Client sample ID	GW29	GW30	GW8	GW28	GW32
			Client sampling date / time	18jVgAj5011d1T 00	19jVgAj5011d1T 00	19jVgAj5011d1T 00	19jVgAj5011d1T 00	19jVgAj5011d1T 00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104161-001**	**EM1104161-002**	**EM1104161-003**	**EM1104161-004**	**EM1104161-005**
EP080/071: Total Petroleum Hydrocarbons - Continued								
C15 - C28 Fraction	jjjj	100	µ: /b	<100	<100	**1110**	<100	<100
C29 - C36 Fraction	jjjj	T0	µ: /b	<T0	<T0	**90**	<T0	<T0
^ C10 - C36 Fraction (sum)	jjjj	T0	µ: /b	<T0	<T0	**1710**	<T0	<T0
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	jjjj	50	µ: /b	<50	<50	**20**	<50	<50
^ C6 - C10 Fraction minus BTEX (F1)	jjjj	50	µ: /b	<50	<50	<50	<50	<50
>C10 - C16 Fraction	jjjj	100	µ: /b	<100	<100	**680**	<100	<100
>C16 - C34 Fraction	jjjj	100	µ: /b	<100	<100	**980**	<100	<100
>C34 - C40 Fraction	jjjj	100	µ: /b	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	jjjj	100	µ: /b	<100	<100	**1660**	<100	<100
EP080: BTEXN								
Benzene	- 1j4Lj5	1	µ: /b	<1	<1	**13**	<1	**5**
Toluene	108j88jL	5	µ: /b	<5	<5	**4**	<5	<5
Ethylbenzene	100j41j4	5	µ: /b	<5	<5	<5	<5	<5
meta- & para-Xylene	108jL8jLd10Fj45jL	5	µ: /b	<5	<5	**2**	<5	<5
ortho-Xylene	9Tj4- jF	5	µ: /b	<5	<5	**2**	<5	<5
^ Total Xylenes	1LL0j50j-	5	µ: /b	<5	<5	**4**	<5	<5
^ Sum of BTEX	jjjj	1	µ: /b	<1	<1	**21**	<1	**5**
Naphthalene	91j50jL	T	µ: /b	<T	<T	**18**	<T	<T
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1- 0F0j0- j0	0C	%	**107**	**104**	**114**	**97.5**	**109**
Toluene-D8	50L- j5FjT	0C	%	**109**	**103**	**114**	**97.9**	**105**
4-Bromofluorobenzene	4F0j00j4	0C	%	**111**	**105**	**122**	**99.8**	**108**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1L15- j88jL	0C	%	**22.9**	**22.7**	**28.8**	**30.0**	**27.4**
2-Chlorophenol-D4	9L9T1j- LjF	0C	%	**59.9**	**55.8**	**66.2**	**76.6**	**63.4**
2.4.6-Tribromophenol	118j- 9jF	0C	%	**115**	**99.2**	**128**	**142**	**118**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	L51jF0j8	0C	%	**106**	**112**	**115**	**142**	**102**
Anthracene-d10	1- 19j0Fj8	0C	%	**99.6**	**86.9**	**110**	**128**	**102**
4-Terphenyl-d14	1- 18jT1j0	0C	%	**110**	**84.1**	**100**	**126**	**99.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1- 0F0j0- j0	0C	%	**114**	**109**	**99.9**	**102**	**114**
Toluene-D8	50L- j5FjT	0C	%	**113**	**106**	**97.5**	**101**	**109**
4-Bromofluorobenzene	4F0j00j4	0C	%	**112**	**107**	**103**	**98.7**	**110**

Analytical Results

Wơrj Ml ytnx: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW38	DUP2	RINSATE 1	TRIP 2	GW37
				Client sampling date / time: 19jVgAj5011ơlT 00	19jVgAj5011ơlT 00	18jVgAj5011ơlT 00	19jVgAj5011ơlT 00	19jVgAj5011ơlT 00
				EM1104161-006	EM1104161-007	EM1104161-008	EM1104161-009	EM1104161-010
EA005: pH								
pH Value	jjjj	0Ơ1	7Hơvry	6.88	7.66	jjjj	jjjj	7.06
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GJWj510j010	T	D: /b	3770	1600	jjjj	jjjj	2260
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	uMBj510j001	1	D: /b	<1	<1	jjjj	jjjj	<1
Carbonate Alkalinity as CaCO3	L815jL5jF	1	D: /b	<1	<1	jjjj	jjjj	<1
Bicarbonate Alkalinity as CaCO3	- 1jT5jL	1	D: /b	373	364	jjjj	jjjj	449
Total Alkalinity as CaCO3	jjjj	1	D: /b	373	364	jjjj	jjjj	449
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808j- 9j8	1	D: /b	585	180	jjjj	jjjj	1060
ED045G: Chloride Discrete analyser								
Chloride	1F88- j00jF	1	D: /b	200	330	jjjj	jjjj	154
ED093F: Dissolved Major Cations								
Calcium	- 440j- 0j5	1	D: /b	102	33	jjjj	jjjj	67
Magnesium	- 4L9j 9Tj4	1	D: /b	46	27	jjjj	jjjj	37
Sodium	- 440j 5LjT	1	D: /b	301	360	jjjj	jjjj	120
Potassium	- 440j 09j-	1	D: /b	13	6	jjjj	jjjj	9
EG020F: Dissolved Metals by ICP-MS								
Aluminium	- 459j 90jT	0Ơ1	D: /b	<0Ơ1	0.02	<0Ơ1	jjjj	<0Ơ1
Arsenic	- 440jL8j5	0Ơ001	D: /b	0.034	0.201	<0Ơ001	jjjj	0.041
Cadmium	- 440j4Lj9	0Ơ0001	D: /b	<0Ơ0001	<0Ơ0001	<0Ơ0001	jjjj	<0Ơ0001
Cobalt	- 440j48j4	0Ơ001	D: /b	0.002	<0Ơ001	<0Ơ001	jjjj	0.003
Copper	- 440jT0j8	0Ơ001	D: /b	0.003	0.001	<0Ơ001	jjjj	0.002
Lead	- 4L9j95j1	0Ơ001	D: /b	0.004	0.004	<0Ơ001	jjjj	<0Ơ001
Manganese	- 4L9j9FjT	0Ơ001	D: /b	1.08	0.169	<0Ơ001	jjjj	0.298
Nickel	- 440j05j0	0Ơ001	D: /b	0.283	0.010	<0Ơ001	jjjj	0.008
Selenium	- - 85j49j5	0Ơ1	D: /b	<0Ơ1	<0Ơ1	<0Ơ1	jjjj	<0Ơ1
Zinc	- 440jFFjF	0Ơ0T	D: /b	0.014	0.005	<0Ơ0T	jjjj	0.010
Boron	- 440j45j8	0ƠT	D: /b	0.96	0.78	<0ƠT	jjjj	0.71
Iron	- 4L9j89jF	0ƠT	D: /b	<0ƠT	<0ƠT	<0ƠT	jjjj	0.23
EG035F: Dissolved Mercury by FIMS								
Mercury	- 4L9j9- jF	0Ơ0001	D: /b	<0Ơ0001	<0Ơ0001	<0Ơ0001	jjjj	<0Ơ0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18T40j59j9	0Ơ1	D: /b	<0Ơ1	<0Ơ1	<0Ơ1	jjjj	<0Ơ1
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	jjjj	0Ơ004	D: /b	0.010	<0Ơ004	<0Ơ004	jjjj	<0Ơ004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

Wcrj Ml ytnx: WATER				Client sample ID	GW38	DUP2	RINSATE 1	TRIP 2	GW37
				Client sampling date / time	19jVgAj5011olT 00	19jVgAj5011olT 00	18jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00
Compound	CAS Number	LOR	Unit		EM1104161-006	EM1104161-007	EM1104161-008	EM1104161-009	EM1104161-010
EK026G: Total Cyanide By Discrete Analyser - Continued									
Total Cyanide	T- j15jT	0O004	D: /b		0.055	0.032	<0O004	jjjj	0.390
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	jjjj	0O004	D: /b		0.013	<0O004	<0O004	jjjj	0.005
EK040P: Fluoride by PC Titrator									
Fluoride	1F984j48j8	0O1	D: /b		0.7	1.4	jjjj	jjjj	1.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	- FF4j41j-	0O01	D: /b		511	87.7	jjjj	jjjj	358
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	jjjj	0O01	D: /b		0.13	0.11	jjjj	jjjj	0.44
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14- 9- jTTj8	0O01	D: /b		0.06	<0O01	jjjj	jjjj	0.47
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	jjjj	0O01	D: /b		0.19	<0O01	jjjj	jjjj	0.90
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	jjjj	0O01	D: /b		<0O01	<0O01	jjjj	jjjj	<0O01
EK085M: Sulfide as S2-									
Sulfide as S2-	1849Fj5Tj8	0O1	D: /b		<0O1	<0O1	<0O1	jjjj	<0O1
EN055: Ionic Balance									
^ Total Anions	jjjj	0O01	DPq/b		25.3	20.4	jjjj	jjjj	35.5
^ Total Cations	jjjj	0O01	DPq/b		22.3	19.7	jjjj	jjjj	jjjj
Total Cations	jjjj	0O01	DPq/b		jjjj	jjjj	jjjj	jjjj	31.6
^ Ionic Balance	jjjj	0O01	%		6.25	1.68	jjjj	jjjj	jjjj
Ionic Balance	jjjj	0O01	%		jjjj	jjjj	jjjj	jjjj	6.11
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100j45jT	T	µ: /b		<T	<T	<T	<T	<T
Isopropylbenzene	98j85j8	T	µ: /b		<T	<T	<T	<T	<T
n-Propylbenzene	10LjFTj1	T	µ: /b		<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	108jF- j8	T	µ: /b		<T	<T	<T	<T	<T
sec-Butylbenzene	1LTj98j8	T	µ: /b		<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	9TjFLjF	T	µ: /b		<T	<T	<T	<T	<T
tert-Butylbenzene	98j0FjF	T	µ: /b		<T	<T	<T	<T	<T
p-Isopropyltoluene	99j8- jF	T	µ: /b		<T	<T	<T	<T	<T
n-Butylbenzene	104jT1j8	T	µ: /b		<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds									
Vinyl Acetate	108j0Tj4	T0	µ: /b		<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	- 8j9LjL	T0	µ: /b		<T0	<T0	<T0	<T0	<T0

Analytical Results

Wcrj Ml ytnx: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW38	DUP2	RINSATE 1	TRIP 2	GW37
				Client sampling date / time: 19jVgAj5011dlT 00	19jVgAj5011dlT 00	18jVgAj5011dlT 00	19jVgAj5011dlT 00	19jVgAj5011dlT 00
				EM1104161-006	EM1104161-007	EM1104161-008	EM1104161-009	EM1104161-010
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	108j10j1	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T91j-8jF	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	-Tj1Tj0	T	µ: /b	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T94j50j-	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dichloropropane	-8j8-jT	T	µ: /b	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100F1j01jT	T	µ: /b	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100F1j05jF	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10Fj9Lj4	T	µ: /b	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	-Tj-1j8	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Chloromethane	-4j8-jL	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	-Tj01j4	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Bromomethane	-4j8Lj9	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Chloroethane	-Tj00jL	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	-TjF9j4	T0	µ: /b	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	-TjLTj4	T	µ: /b	<T	<T	<T	<T	<T
Iodomethane	-4j88j4	T	µ: /b	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1TFjF0jT	T	µ: /b	<T	<T	<T	<T	<T
1.1-Dichloroethane	-TjL4jL	T	µ: /b	<T	<T	<T	<T	<T
cis-1.2-Dichloroethene	1TFjT9j5	T	µ: /b	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	-1jTTjF	T	µ: /b	<T	<T	<T	<T	<T
1.1-Dichloropropylene	TFLjT8jF	T	µ: /b	<T	<T	<T	<T	<T
Carbon Tetrachloride	TFj5LjT	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dichloroethane	10-j0Fj5	T	µ: /b	<T	<T	<T	<T	<T
Trichloroethene	-9j01jF	T	µ: /b	<T	<T	<T	<T	<T
Dibromomethane	-4j9TjL	T	µ: /b	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	-9j00jT	T	µ: /b	<T	<T	<T	<T	<T
1.3-Dichloropropane	145j58j9	T	µ: /b	<T	<T	<T	<T	<T
Tetrachloroethene	15-j18j4	T	µ: /b	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	FL0j50jF	T	µ: /b	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110jT-jF	T	µ: /b	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14-Fj11jT	T	µ: /b	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	-9jL4jT	T	µ: /b	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	9Fj18j4	T	µ: /b	<T	<T	<T	<T	<T
Pentachloroethane	-Fj01j-	T	µ: /b	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	9Fj15j8	T	µ: /b	<T	<T	<T	<T	<T

Analytical Results

Wcrj Ml ytnx: WATER				Client sample ID	GW38	DUP2	RINSATE 1	TRIP 2	GW37
				Client sampling date / time	19jVgAj5011olT 00	19jVgAj5011olT 00	18jVgAj5011olT 00	19jVgAj5011olT 00	19jVgAj5011olT 00
Compound	*CAS Number*	*LOR*	*Unit*		**EM1104161-006**	**EM1104161-007**	**EM1104161-008**	**EM1104161-009**	**EM1104161-010**
EP074E: Halogenated Aliphatic Compounds - Continued									
Hexachlorobutadiene	8-jF8jL	T	µ: /b		<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108j90j-	T	µ: /b		<T	<T	<T	<T	<T
Bromobenzene	108j8Fj1	T	µ: /b		<T	<T	<T	<T	<T
2-Chlorotoluene	9Tj49j8	T	µ: /b		<T	<T	<T	<T	<T
4-Chlorotoluene	10Fj4Lj4	T	µ: /b		<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41j-Lj1	T	µ: /b		<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10Fj4Fj-	T	µ: /b		<T	<T	<T	<T	<T
1.2-Dichlorobenzene	9TjT0j1	T	µ: /b		<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	150j85j1	T	µ: /b		<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	8-jF1jF	T	µ: /b		<T	<T	<T	<T	<T
EP074G: Trihalomethanes									
Chloroform	F-jFFjL	T	µ: /b		<T	<T	<T	<T	<T
Bromodichloromethane	-Tj5-j4	T	µ: /b		<T	<T	<T	<T	<T
Dibromochloromethane	154j48j1	T	µ: /b		<T	<T	<T	<T	<T
Bromoform	-Tj5Tj5	T	µ: /b		<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91j50jL	10	µ: /b		**20.6**	<10	<10	<10	**27.8**
Acenaphthylene	508j9Fj8	10	µ: /b		<10	<10	<10	<10	<10
Acenaphthene	8LjL5j9	10	µ: /b		<10	<10	<10	<10	**5.7**
Fluorene	8Fj-Lj-	10	µ: /b		<10	<10	<10	<10	<10
Phenanthrene	8Tj01j8	10	µ: /b		<10	<10	<10	<10	<10
Anthracene	150j15j-	10	µ: /b		<10	<10	<10	<10	<10
Fluoranthene	50Fj44j0	10	µ: /b		<10	<10	<10	<10	<10
Pyrene	159j00j0	10	µ: /b		<10	<10	<10	<10	<10
Benz(a)anthracene	TFjTTjL	10	µ: /b		<10	<10	<10	<10	<10
Chrysene	518j01j9	10	µ: /b		<10	<10	<10	<10	<10
Benzo(b)fluoranthene	50Tj99j5	10	µ: /b		<10	<10	<10	<10	<10
Benzo(k)fluoranthene	50-j08j9	10	µ: /b		<10	<10	<10	<10	<10
Benzo(a)pyrene	T0jL5j8	0C	µ: /b		<0C	<0C	<0Θ	<0CF	<0CF
Indeno(1.2.3.cd)pyrene	19LjL9jT	10	µ: /b		<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	TLj-0jL	10	µ: /b		<10	<10	<10	<10	<10
Benzo(g.h.i)perylene	191j54j5	10	µ: /b		<10	<10	<10	<10	<10
^ Sum of polycyclic aromatic hydrocarbons	jjjj	0C	µ: /b		**20.6**	<10	<10Ω	<10F	**33.5**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	jjjj	50	µ: /b		**40**	<50	<50	<50	**60**
C10 - C14 Fraction	jjjj	T0	µ: /b		**3370**	<T0	<T0	<T0	**610**

Analytical Results

Wcrj Ml ytnx: WATER				Client sample ID	GW38	DUP2	RINSATE 1	TRIP 2	GW37
				Client sampling date / time	19jVgAj5011d1T 00	19jVgAj5011d1T 00	18jVgAj5011d1T 00	19jVgAj5011d1T 00	19jVgAj5011d1T 00
Compound	CAS Number	LOR	Unit		EM1104161-006	EM1104161-007	EM1104161-008	EM1104161-009	EM1104161-010
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	jjjj	100	µ: /b		1850	<100	<100	<100	1330
C29 - C36 Fraction	jjjj	T0	µ: /b		130	<T0	<T0	<T0	60
^ C10 - C36 Fraction (sum)	jjjj	T0	µ: /b		5350	<T0	<T0	<T0	2000
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	jjjj	50	µ: /b		40	<50	<50	<50	60
^ C6 - C10 Fraction minus BTEX (F1)	jjjj	50	µ: /b		<50	<50	<50	<50	<50
>C10 - C16 Fraction	jjjj	100	µ: /b		3590	<100	<100	<100	880
>C16 - C34 Fraction	jjjj	100	µ: /b		1580	<100	<100	<100	1110
>C34 - C40 Fraction	jjjj	100	µ: /b		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	jjjj	100	µ: /b		5170	<100	<100	<100	1990
EP080: BTEXN									
Benzene	- 1j4Lj5	1	µ: /b		27	<1	<1	<1	42
Toluene	108j88jL	5	µ: /b		10	<5	<5	<5	12
Ethylbenzene	100j41j4	5	µ: /b		<5	<5	<5	<5	<5
meta- & para-Xylene	108jL8jLd10Fj45jL	5	µ: /b		4	<5	<5	<5	5
ortho-Xylene	9Tj4- jF	5	µ: /b		3	<5	<5	<5	3
^ Total Xylenes	1LL0j50j-	5	µ: /b		7	<5	<5	<5	8
^ Sum of BTEX	jjjj	1	µ: /b		44	<1	<1	<1	62
Naphthalene	91j50jL	T	µ: /b		28	<T	<T	<T	40
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	1- 0F0j0- j0	0C	%		105	101	105	100	125
Toluene-D8	50L- j5FjT	0C	%		104	104	104	101	125
4-Bromofluorobenzene	4F0j00j4	0C	%		112	102	108	103	114
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	1L15- j88jL	0C	%		28.1	11.5	23.2	27.1	22.0
2-Chlorophenol-D4	9L9T1j- LjF	0C	%		65.0	20.4	47.9	63.8	60.1
2.4.6-Tribromophenol	118j- 9jF	0C	%		142	129	70.1	106	136
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	L51jF0j8	0C	%		111	81.1	89.0	100	119
Anthracene-d10	1- 19j0Fj8	0C	%		106	112	62.7	95.3	105
4-Terphenyl-d14	1- 18jT1j0	0C	%		97.1	115	68.7	102	98.4
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	1- 0F0j0- j0	0C	%		91.2	106	111	105	110
Toluene-D8	50L- j5FjT	0C	%		90.3	108	108	104	108
4-Bromofluorobenzene	4F0j00j4	0C	%		94.4	105	107	104	114

Surrogate Control Limits

Wcr jMl ytnx: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1- 0F0j0- j0	- 5	1L5
Toluene-D8	50L- j5FjT	- 4	158
4-Bromofluorobenzene	4F0j00j4	- 0	1L5
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	1L15- j88jL	10	T8
2-Chlorophenol-D4	9L9T1j- LjF	10	154
2.4.6-Tribromophenol	118j- 9jF	5F	1L8
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	L51jF0j8	L5	155
Anthracene-d10	1- 19j0Fj8	L4	1LF
4-Terphenyl-d14	1- 18jT1j0	L4	140
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1- 0F0j0- j0	- L	1L1
Toluene-D8	50L- j5FjT	- 5	154
4-Bromofluorobenzene	4F0j00j4	- 0	15F

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Environmental Earth Sciences	**TURNAROUND REQUIREMENTS:** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)** Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: °C; Other comment: 3.2 – 4.A
OFFICE: P.O.BOX 2253, FOOTSCRAY , VIC, 3011		
PROJECT: 210074 ALBERT PARK GAS WORKS	**ALS QUOTE NO.:** ME/015/11 V3	**COC SEQUENCE NUMBER (Circle)** CO 1 2 3 4 5
ORDER NUMBER:		OI 1 2 3 4 5
PROJECT MANAGER: DAVID JAMES	**CONTACT PH:** 0403 033 796	
SAMPLER:	**SAMPLER MOBILE:** 0437 033 796	
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):** ENMRG & ESDAT	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 19/4/2011 3:30pm	DATE/TIME:	DATE/TIME:	DATE/TIME: 19/4, 5.A

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS (MATRIX: Solid(S) Water(W))			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH, TDS, Free Cyanide, Total cyanide, WAD cyanide, Sulphide	NT-1 package - Ca, Mg, Na, K	NT-2 Package - Cl, SO4, Alk	NT-3 Package - NO2, NO3, Fl, Reactive P	NH4 - Ammonium - (field pH and field temperature must be recorded)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B, Mn & Hg (lab to centrifuge, filter and acidify from red/green metals bottle)	Hexavalent Chromium	W-10 Package - TPH/BTEX/PAH Plus VOC	Free Cyanide, Total cyanide, WAD cyanide, Sulphide	Sample Ph	Sample Temp		
1	GW29	18/04/2011			8	x	x	x	x	x	x	x	x		7.56	19.60		
2	GW30	19/04/2011			8	x	x	x	x	x	x	x	x		7.39	17.70		
3	GW8	19/04/2011			8	x	x	x	x	x	x	x	x		6.26	19.20		
4	GW28	19/04/2011			8	x	x	x	x	x	x	x	x		7.74	19.80		
5	GW32	19/04/2011			8	x	x	x	x	x	x	x	x		7.69	19.00		
6	GW38	19/04/2011			8	x	x	x	x	x	x	x	x		6.97	18.00		
7	DUP2	19/04/2011			8	x	x	x	x	x	x	x	x		7.74	19.80		
	SPLIT 2	19/04/2011			8	x	x	x	x	x	x	x	x		7.74	19.80		Please forward SPLIT2 to SGS Australia Pty Ltd with copy of COC. (34 Norfolk Court, Coburg Vic 3058)
8	RINSATE 1	18/04/2011			7						x	x	x	x				
not received	TRIP 1	18/04/2011			3								x					
9	TRIP 2	19/04/2011			3								x					
				TOTAL	77	X	X	X	X	X	X	X	X	X	→ as per client (Carol)			

Environmental Division
Melbourne
Work Order
EM1104161
Telephone : +61-3-8549 9600

ex SO

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

AM 20/4

COC rec'd 19/4/11 4:45 Peter

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM11041A1**	Page	: 1 of 16
mn et dn et N	: **1**		
Client	: EVI RTOVMEVLmH EmTLS C5 REV5 EC	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GASWORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 19-APR-2011
Sampler	: DJ	Issue Date	: 30-MAY-2011
Order number	: ----		
		No. of samples received	: 10
Quote number	: ME/015/11 V3	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Em00p: (S Q 5 HoN 18p) Ap) a									
EM1104121-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	7.74	7.73	0.1	0% - 20%
EM1104121-010	Anonymous	EA005: pH Value	---	0.01	pH Unit	6.99	6.75	3.5	0% - 20%
Em01p: LoN Di svvoBed CoBdv Q 5 HoN 18p))) 4a									
EM1104121-001	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	2930	2850	2.8	0% - 20%
EM1104121-010	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	<5	<5	0.0	No Limit
Ei 038P: mDxl Bt sty by P5 LsNl Nor Q 5 HoN 18p) A09a									
EM1104160-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1500	1450	3.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	1500	1450	3.4	0% - 20%
EM1104161-010	GW37	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	449	452	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	449	452	0.7	0% - 20%
Ei 041G: CuDl Ne QurbsdsnenNscal v CO4 92by i m Q 5 HoN 18A001pa									
EM1104121-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	80	80	0.0	0% - 20%
EM1104121-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	74	74	0.0	0% - 20%
Ei 04pG: 5 - Dorsde i svcreNe l t l Dyver Q 5 HoN 18A0014a									
EM1104121-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1190	1200	0.4	0% - 20%
EM1104121-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1400	1200	15.7	0% - 20%
Ei 0) 3h: i svvoBed Ml For 5 l Not v Q 5 HoN 18A0019a									
EM1104121-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	53	52	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	47	47	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	826	841	1.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	31	32	3.4	0% - 20%
EM1104161-001	GW29	ED093F: Calcium	7440-70-2	1	mg/L	57	58	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	56	56	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	602	608	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EG090h: i svvoBed MeN Dr by F5 P2MC Q 5 HoN 18A94A1a									
EM1104161-001	GW29	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.0	No Limit

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG090h: i svvoDsed MeN D by R5 P2MC Q 5 HoN 18A94A1a 2cot Nt ued									
EM1104161-001	GW29	EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.403	0.396	1.7	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.008	0.008	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.021	0.020	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.46	0.46	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM1104165-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.009	0.008	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.26	2.30	1.4	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.028	0.030	7.7	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.127	0.130	2.9	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	2.10	2.05	2.4	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	6.97	6.35	9.2	0% - 20%
EG03ph: i svvoDsed Mercury by hRMC Q 5 HoN 18A94A0a									
EM1104161-001	GW29	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM1104165-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG0p0h: i svvoDsed Sej l 6l Dt N5 - ron sun Q 5 HoN 18A01xAa									
EM1104149-003	Anonymous	EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1104161-006	GW38	EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK09pG: hree cyl t sde by i svcreNe mt l Dyver Q 5 HoN 18Ax8p8a									
EM1104161-001	GW29	EK025G: Free Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104165-001	Anonymous	EK025G: Free Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK09AG: LoN D5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A3040a									
EM1104161-001	GW29	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104165-001	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK09xG: Wel k mcsd i svvocs bDe 5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A44A9a									
EM1104129-004	Anonymous	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104129-013	Anonymous	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK09xG: Wel k mcsd i svvocs bDe 5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A44A3a									
EM1104161-004	GW28	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1104165-004	Anonymous	EK028G: Weak Acid Dissociable Cyanide	---	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: hDuorsde by P5 LsNl Nor Q 5 HoN 18p) A01a									

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK040P: hDuorsde by P5 LsNl Nor Q(5 HoN 18p) A01a 2cot Nt ued									
EM1104137-008	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	3.5	3.5	0.0	0% - 20%
EM1104164-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	3.2	3.2	0.0	0% - 20%
EK0p8G: VstsNe l v V by i svcreNe mt l Dyver Q(5 HoN 18A0013a									
EM1104121-001	Anonymous	EK057G: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1104161-001	GW29	EK057G: Nitrite as N	---	0.01	mg/L	0.09	<0.01	160	No Limit
EK0p) G: VstsNe (Duv VstNl Ne l v V OVOj a by i svcreNe mt l Dyver Q(5 HoN 18AA134a									
EM1104121-001	Anonymous	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	1.75	1.70	3.2	0% - 20%
EM1104121-010	Anonymous	EK059G: Nitrite + Nitrate as N	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK081G: Tel cN6e P- ov(- oruv l v P by dsvcreNe l t l Dyver Q(5 HoN 18A001Aa									
EM1104161-001	GW29	EK071G: Reactive Phosphorus as P	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1104200-002	Anonymous	EK071G: Reactive Phosphorus as P	---	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK0xpM: CuDsde l v C92 Q(5 HoN 18p)) 33a									
EM1104161-001	GW29	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM1104215-001	Anonymous	EK085: Sulfide as S2-	18496-25-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP084m: Mot ocycBc mron l Nc Sydrocl rbot v Q(5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP084B: Oj yget l Ned 5 on (out dv Q(5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EM1104165-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP084B: Oj yget l Ned 5 on (out dv Ot 5 HoN 18A44) 1a 2cot Nt ued									
EM1104165-001	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP0845 : CuDot l Ned 5 on (out dv Ot 5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP084i : hun sgl t Nv Ot 5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP084E: Sl Doget l Ned mB(- l Nc 5 on (out dv Ot 5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP084E: SI Dget l Ned mB(- l Nc 5on (out dv Q 5 HoN 18A44) 1a 2cot Nt ued									
EM1104161-001	GW29	EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EM1104165-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP084h: SI Dget l Ned mron l Nc 5on (out dv Q 5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP084h: SI Dget I Ned mron I Nc 5on (out dv Q 5 HoN 18A44) 1a 2cot Nt ued									
EM1104161-001	GW29	EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP084G: Lrs- I Don eN I t ev Q 5 HoN 18A44) 1a									
EM1104161-001	GW29	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP0x0/081: LoN DPeNoDun Sydrocl rbot v Q 5 HoN 18A44) 9a									
EM1104161-001	GW29	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EM1104165-001	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP0x0/081: LoN DTeco6erl bDe Sydrocl rbot v 2VEPM 9010 i rl fN Q 5 HoN 18A44) 9a									
EM1104161-001	GW29	EP080: C6 - C10 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EM1104165-001	Anonymous	EP080: C6 - C10 Fraction	---	20	µg/L	<20	<20	0.0	No Limit
EP0x0: BLEXV Q 5 HoN 18A44) 9a									
EM1104161-001	GW29	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EM1104165-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WmLET**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP0x0: BLEXV Cr 5 HoN 18A44) 9a 2cot Nt ued									
EM1104165-001	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WmLET**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
Em01p: LoN Di svvoDed CoDdv Q(5HoN18p)))4a								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	<5	2000 mg/L	99.9	98	104
Ei 038P: mDkl Dt sty by P5 LsNl Nor Q(5HoN18p)A09a								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	88.0	77	127
Ei 041G: CuDl Ne Qurbsdsn eNtscal v CO4 92by i m Q(5HoN18A001pa								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	12.5 mg/L	100	81	125
Ei 04pG: 5-Dorsde i svcreNe l t l Dyver Q(5HoN18A0014a								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	98.8	89	117
Ei 0)3h: i svvoDed Ml For 5l Not v Q(5HoN18A0019a								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	102	81	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	101	80	120
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.1	78	124
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.2	79	121
EG090h: i svvoDed MeN Dy by F5P2MC Q(5HoN18A94A1a								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	105	80	120
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	107	87	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	88	110
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	107	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	106	86	108
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	106	90	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.0	87	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.2	83	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.9	86	120
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	99.0	61	133
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	79	119
EG03ph: i svvoDed Mercury by hRMC Q(5HoN18A94A0a								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	102	71	125
EG0p0h: i svvoDed Sej l 6l Dt N5-ron sun Q(5HoN18A01xAa								
EG050F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.5 mg/L	94.0	80	120
EK09pG: hree cyl t sde by i svcreNe mt l Dyver Q(5HoN18Ax8p8a								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.5 mg/L	86.0	73	111
EK09AG: LoN D5yl t sde By i svcreNe mt l Dyver Q(5HoN18A3040a								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	109	85	125

Sub-Matrix: **WmLET**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK09xG: Wel k mcsd i svvocs bDe 5yl t sde By i svcreNe mt l Dyver Qt 5 HoN 18A44A9a								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.5 mg/L	67.6	64	104
EK09xG: Wel k mcsd i svvocs bDe 5yl t sde By i svcreNe mt l Dyver Qt 5 HoN 18A44A3a								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.5 mg/L	76.6	64	104
EK040P: hDuorsde by P5 LsNl Nor Qt 5 HoN 18p) A01a								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	102	78	120
EK0p8G: VsNsNe l v V by i svcreNe mt l Dyver Qt 5 HoN 18A0013a								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	91.0	84	112
EK0p) G: VsNsNe (Duv VsNl Ne l v V QtVOj a by i svcreNe mt l Dyver Qt 5 HoN 18AA134a								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	84.7	73	127
EK081G: Tel cN6e P- ov(- oruv l v P by dsvcreNe l t l Dyver Qt 5 HoN 18A001Aa								
EK071G: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	94.3	84	108
EK0xpM: CuDsde l v C92 Qt 5 HoN 18p)) 33a								
EK085: Sulfide as S2-	18496-25-8	0.10	mg/L	<0.1	0.5 mg/L	90.0	82	116
EP084m: Mot ocycBc mron l Nc Sydrocl rbot v Qt 5 HoN 18A44) 1a								
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	119	74	122
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	116	80	120
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	# 120	70	120
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	# 119	71	119
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	118	72	120
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	102	73	119
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	118	73	119
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	119	71	121
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	120	65	121
EP084B: Oj yget l Ned 5 on (out dv Qt 5 HoN 18A44) 1a								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	200 µg/L	81.2	57	131
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	200 µg/L	117	69	135
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	200 µg/L	112	68	136
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	200 µg/L	116	68	138
EP0845 : CuDot l Ned 5 on (out dv Qt 5 HoN 18A44) 1a								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	20 µg/L	117	67	127
EP084i : hun sgl t Nv Qt 5 HoN 18A44) 1a								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	109	59	128
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	116	77	121
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	114	70	118
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	112	66	120
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	116	78	124
EP084E: Sl Dget l Ned mB(- l Nc 5 on (out dv Qt 5 HoN 18A44) 1a								

Sub-Matrix: WmLET

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP084E: SI Dget I Ned mB(- I Nc 5 on (out dv Q 5 HoN 18A44) 1a 2cot Nt ued								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	118	58	148
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	136	62	142
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	124	61	141
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	122	57	131
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	129	64	138
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	119	67	131
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	113	71	125
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	115	61	135
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	116	75	121
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	114	77	121
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	114	78	122
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	107	70	120
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	114	74	122
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	94.9	57	123
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	117	75	125
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	114	77	121
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	113	76	122
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	119	78	126
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	115	79	125
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	119	76	122
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	102	65	119
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	96.0	46	126
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	108	54	132
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	115	75	131
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	115	75	133
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	91.9	46	118
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	91.4	54	124
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	123	50	134
EP084h: SI Dget I Ned mron I Nc 5 on (out dv Q 5 HoN 18A44) 1a								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	120	81	121
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	109	75	119
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	103	73	121
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	106	72	120
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	106	73	119
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	110	74	120
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	105	78	118
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	98.1	56	128
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	92.5	69	123
EP084G: Lrs- I Dn eN I t ev Q 5 HoN 18A44) 1a								

Sub-Matrix: **WmLET**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP084G: Lrs- l Don eN l t ev Q(5 HoN 18A44) 1a 2cot Nt ued								
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	116	77	121
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	102	69	117
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	87.8	59	119
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	80.2	49	121
EP08pQ(RMaB: Poly t ucDe l r mron l Nc Sydrocl rbot v Q(5 HoN 18p) px) a								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	55.4	27.5	124
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	58.9	35	129
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	56.4	35	127
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	60.2	36	130
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	64.5	42	132
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	63.0	42	132
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	65.2	41	141
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	66.5	40	142
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	69.6	33	153
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	61.9	37	145
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	60.2	35	151
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	59.9	39	141
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	62.9	41	139
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	71.0	35	141
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	72.6	36	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	72.0	10	142
EP0x0/081: LoN DPeNoDe un Sydrocl rbot v Q(5 HoN 18p) pxxa								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2720 µg/L	123	64	124
EP071: C15 - C28 Fraction	----	100	µg/L	<100	8912 µg/L	115	70	130
EP071: C29 - C36 Fraction	----	50	µg/L	<50	1847 µg/L	118	68	128
EP0x0/081: LoN DPeNoDe un Sydrocl rbot v Q(5 HoN 18A44) 9a								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	104	72	136
EP0x0/081: LoN DTeco6erl bDe Sydrocl rbot v 2VEPM 9010 i rl fN Q(5 HoN 18p) pxxa								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5160 µg/L	100	70	130
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	8320 µg/L	117	70	130
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	540 µg/L	122	70	130
EP0x0/081: LoN DTeco6erl bDe Sydrocl rbot v 2VEPM 9010 i rl fN Q(5 HoN 18A44) 9a								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	370 µg/L	102	70	130
EP0x0: BLEXV Q(5 HoN 18A44) 9a								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	73	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	107	74	128
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	108	72	126

Sub-Matrix: **WmLET**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP0x0: BLEXV Q' 5 HoN 18A44) 9a 2cot Nt ued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	108	69	133
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	109	74	128
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	107	70	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WmLET**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
Ei 041G: CuDl Ne Qurbsdsn eNscal v CO4 92by i m Q 5 HoN 18A001pa							
EM1104121-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
Ei 04pG: 5 - Dorsde i svcreNe l t l Dyver Q 5 HoN 18A0014a							
EM1104121-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	124	70	130
EG090h: i svvoDed MeN Dy by R5 P2MC Q 5 HoN 18A94A1a							
EM1104161-001	GW29	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	104	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	99.9	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	101	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	96.3	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	90.0	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	98.8	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	94.7	68	136
EG03ph: i svvoDed Mercury by hRMC Q 5 HoN 18A94A0a							
EM1104161-002	GW30	EG035F: Mercury	7439-97-6	0.0100 mg/L	97.7	70	130
EG0p0h: i svvoDed Sej l 6l Det N5 - ron sun Q 5 HoN 18A01xAa							
EM1104149-004	Anonymous	EG050F: Hexavalent Chromium	18540-29-9	0.5 mg/L	114	70	130
EK09pG: hree cyl t sde by i svcreNe mt l Dyver Q 5 HoN 18Ax8p8a							
EM1104161-002	GW30	EK025G: Free Cyanide	----	0.5 mg/L	93.7	70	130
EK09AG: LoN D5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A3040a							
EM1104161-002	GW30	EK026G: Total Cyanide	57-12-5	0.2 mg/L	108	70	130
EK09xG: Wel k mcsd i svvocs bDe 5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A44A9a							
EM1104129-005	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.5 mg/L	80.6	70	130
EK09xG: Wel k mcsd i svvocs bDe 5 yl t sde By i svcreNe mt l Dyver Q 5 HoN 18A44A3a							
EM1104161-005	GW32	EK028G: Weak Acid Dissociable Cyanide	----	0.5 mg/L	97.4	70	130
EK040P: hDuorsde by P5 LsNl Nor Q 5 HoN 18p) A01a							
EM1104161-001	GW29	EK040P: Fluoride	16984-48-8	5.0 mg/L	101	70	130
EK0p8G: VsNsNe l v V by i svcreNe mt l Dyver Q 5 HoN 18A0013a							
EM1104121-002	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	113	70	130
EK0p) G: VsNsNe (Duv VsNl Ne l v V QVOj a by i svcreNe mt l Dyver Q 5 HoN 18AA134a							
EM1104121-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70	130
EK081G: Tel cN6e P- ov(- oruv l v P by dsvcreNe l t l Dyver Q 5 HoN 18A001Aa							
EM1104161-002	GW30	EK071G: Reactive Phosphorus as P	----	0.5 mg/L	100	70	130

Sub-Matrix: **WmLET**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP084E: SI Doget l Ned mD(- l Nc 5 on (out dv Q(5 HoN 18A44) 1a							
EM1104161-002	GW30	EP074: 1.1-Dichloroethene	75-35-4	20 µg/L	97.4	54	104
		EP074: Trichloroethene	79-01-6	20 µg/L	98.0	62	120
EP084h: SI Doget l Ned mron l Nc 5 on (out dv Q(5 HoN 18A44) 1a							
EM1104161-002	GW30	EP074: Chlorobenzene	108-90-7	20 µg/L	112	68	132
EP0x0/081: LoN DPeNoDun Sydrocl rbot v Q(5 HoN 18A44) 9a							
EM1104161-002	GW30	EP080: C6 - C9 Fraction	----	280 µg/L	103	51	125
EP0x0/081: LoN DTeco6erl bDe Sydrocl rbot v 2VEPM 9010 i rl fN Q(5 HoN 18A44) 9a							
EM1104161-002	GW30	EP080: C6 - C10 Fraction	----	330 µg/L	103	70	130
EP0x0: BLEXV Q(5 HoN 18A44) 9a							
EM1104161-002	GW30	EP080: Benzene	71-43-2	20 µg/L	98.1	63	131
		EP080: Toluene	108-88-3	20 µg/L	101	65	133

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104161**	Page	: 1 of 13
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 225F YOOTSCRA, VICUA0 STRALIA F411	Address	: 3 Westall Rd Springvale VIC Australia F171
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Telephone	: +61 96871666	Telephone	: +61-F-8539 9648
Yacsimile	: +61 4F 96871833	Yacsimile	: +61-F-8539 9641
Project	: 214473 ALBERT PARK GASWORKS	QC Level	: NEPM 1999 Schedule B(F) and ALS QCSF requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 19-APR-2411
Sampler	: DJ	Issue Date	: F4-MA, -2411
Order number	: ----		
		No. of samples received	: 14
Quote number	: ME/415/11 VF	No. of samples analysed	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Yrequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. Yor composite samplesU sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on 0 SEPA SW 836U APHAU AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. Yor non -volatile analytesU the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (13 days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural GW29	**18-APR-2011**	**----**	----	----	**21-APR-2011**	18-APR-2411	×
Clear Plastic Bottle - Natural GWF4U GW8U GW28U GWF2U GWF8U D0P2U GWF7	**19-APR-2011**	**----**	----	----	**21-APR-2011**	19-APR-2411	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural GW29	**18-APR-2011**	**----**	----	----	**21-APR-2011**	25-APR-2411	✓
Clear Plastic Bottle - Natural GWF4U GW8U GW28U GWF2U GWF8U D0P2U GWF7	**19-APR-2011**	**----**	----	----	**21-APR-2011**	26-APR-2411	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural GW29	**18-APR-2011**	**---**	42-MA, -2411	----	**21-APR-2011**	42-MA, -2411	✓
Clear Plastic Bottle - Natural GWF4U GW8U GW28U GWF2U GWF8U D0P2U GWF7	**19-APR-2011**	**---**	4F-MA, -2411	----	**21-APR-2011**	4F-MA, -2411	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural GW29	**18-APR-2011**	**---**	16-MA, -2411	----	**28-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Natural GWF4U GW8U GW28U GWF2U GWF8U D0P2U GWF7	**19-APR-2011**	**---**	17-MA, -2411	----	**28-APR-2011**	17-MA, -2411	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural							
GW29	**18-APR-2011**	---	16-MA, -2411	----	**28-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Natural							
GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	**19-APR-2011**	---	17-MA, -2411	----	**28-APR-2011**	17-MA, -2411	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW29	**18-APR-2011**	---	16-MA, -2411	----	**28-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Filtered; Lab-acidified							
GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	**19-APR-2011**	---	17-MA, -2411	----	**28-APR-2011**	17-MA, -2411	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW29	**18-APR-2011**	---	15-OCT-2411	----	**28-APR-2011**	15-OCT-2411	✓
Clear Plastic Bottle - Filtered; Lab-acidified							
GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	**19-APR-2011**	---	16-OCT-2411	----	**28-APR-2011**	16-OCT-2411	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified							
RINSATE 1	**18-APR-2011**	---	15-OCT-2411	----	**28-APR-2011**	15-OCT-2411	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified							
GW29	**18-APR-2011**	---	16-MA, -2411	----	**02-MAY-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Filtered; Lab-acidified							
GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	**19-APR-2011**	---	17-MA, -2411	----	**02-MAY-2011**	17-MA, -2411	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified							
RINSATE 1	**18-APR-2011**	---	42-MA, -2411	----	**02-MAY-2011**	42-MA, -2411	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH							
GW29U, RINSATE 1	**18-APR-2011**	**----**	----	----	**21-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - NaOH							
GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	**19-APR-2011**	**----**	----	----	**21-APR-2011**	17-MA, -2411	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK025G: Free cyanide by Discrete Analyser								
White Plastic Bottle-NaOH								
GW29U	RINSATE 1	**18-APR-2011**	**02-MAY-2011**	42-MA, -2411	✓	**02-MAY-2011**	42-MA, -2411	✓
White Plastic Bottle-NaOH								
GWF4U	GW8U	**19-APR-2011**	**02-MAY-2011**	4F-MA, -2411	✓	**02-MAY-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK026G: Total Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
GW29U	RINSATE 1	**18-APR-2011**	**27-APR-2011**	42-MA, -2411	✓	**27-APR-2011**	42-MA, -2411	✓
White Plastic Bottle-NaOH								
GWF4U	GW8U	**19-APR-2011**	**27-APR-2011**	4F-MA, -2411	✓	**27-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
GW29U	RINSATE 1	**18-APR-2011**	**28-APR-2011**	42-MA, -2411	✓	**28-APR-2011**	42-MA, -2411	✓
White Plastic Bottle-NaOH								
GWF4U	GW8U	**19-APR-2011**	**28-APR-2011**	4F-MA, -2411	✓	**28-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural								
GW29		**18-APR-2011**	---	16-MA, -2411	----	**21-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Natural								
GWF4U	GW8U	**19-APR-2011**	---	17-MA, -2411	----	**21-APR-2011**	17-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
GW29		**18-APR-2011**	---	16-MA, -2411	----	**03-MAY-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Sulfuric Acid								
GWF4U	GW8U	**19-APR-2011**	---	17-MA, -2411	----	**03-MAY-2011**	17-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural								
GW29		**18-APR-2011**	---	24-APR-2411	----	**20-APR-2011**	24-APR-2411	✓
Clear Plastic Bottle - Natural								
GWF4U	GW8U	**19-APR-2011**	---	21-APR-2411	----	**20-APR-2011**	21-APR-2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
GW29		**18-APR-2011**	---	16-MA, -2411	----	**28-APR-2011**	16-MA, -2411	✓
Clear Plastic Bottle - Sulfuric Acid								
GWF4U	GW8U	**19-APR-2011**	---	17-MA, -2411	----	**28-APR-2011**	17-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural								
GW29		**18-APR-2011**	---	24-APR-2411	----	**20-APR-2011**	24-APR-2411	✓
Clear Plastic Bottle - Natural								
GWF4U	GW8U	**19-APR-2011**	---	21-APR-2411	----	**20-APR-2011**	21-APR-2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EK085M: Sulfide as S2-								
Clear Plastic Bottle - Zinc Acetate/NaOH								
GW29U	RINSATE 1	**18-APR-2011**	**----**	----	----	**21-APR-2011**	25-APR-2411	✓
Clear Plastic Bottle - Zinc Acetate/NaOH								
GWF4U	GW8U	**19-APR-2011**	**----**	----	----	**21-APR-2011**	26-APR-2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
GWF7								
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074B: Oxygenated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							
EP074C: Sulfonated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							
EP074D: Fumigants								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0P2U							
TRIP 2U	GWF7							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074G: Trihalomethanes								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
GW29U	RINSATE 1	**18-APR-2011**	**21-APR-2011**	25-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
Amber Glass Bottle - Unpreserved								
GWF4U	GW8U	**19-APR-2011**	**21-APR-2011**	26-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
GW29U	RINSATE 1	**18-APR-2011**	**21-APR-2011**	25-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
Amber Glass Bottle - Unpreserved								
GWF4U	GW8U	**19-APR-2011**	**21-APR-2011**	26-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved								
GW29U	RINSATE 1	**18-APR-2011**	**21-APR-2011**	25-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
Amber Glass Bottle - Unpreserved								
GWF4U	GW8U	**19-APR-2011**	**21-APR-2011**	26-APR-2411	✓	**29-APR-2011**	F1-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							
EP080: BTEXN								
Amber VOC Vial- NaHSO4 or H2SO4								
GW29U	RINSATE 1	**18-APR-2011**	**29-APR-2011**	42-MA, -2411	✓	**30-APR-2011**	42-MA, -2411	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GWF4U	GW8U	**19-APR-2011**	**29-APR-2011**	4F-MA, -2411	✓	**30-APR-2011**	4F-MA, -2411	✓
GW28U	GWF2U							
GWF8U	D0 P2U							
TRIP 2U	GWF7							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (D0 P)							
Alkalinity by PC Titrator	ED4F7-P	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Chloride by Discrete Analyser	ED435G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Mercury by YIMS	EG4F5Y	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Metals by ICP-MS - Suite A	EG424A-Y	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yluoride by PC Titrator	EK434P	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yree CN by Discrete Analyser	EK425G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Hexavalent Chromium - Dissolved	EG454Y	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Major Cations - Dissolved	ED49FY	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK459G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite as N by Discrete Analyser	EK457G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
pH	EA445	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Reactive Phosphorus as P-By Discrete Analyser	EK471G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfate (Turbidimetric) as SO3 2- by Discrete Analyser	ED431G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfide as S2-	EK485	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Cyanide By Discrete Analyser	EK426G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Dissolved Solids (High Level)	EA415H	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH Volatiles/BTEX	EP484	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Volatile Organic Compounds	EP473	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK428G	3	34	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED4F7-P	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Chloride by Discrete Analyser	ED435G	2	24	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Mercury by YIMS	EG4F5Y	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Metals by ICP-MS - Suite A	EG424A-Y	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yluoride by PC Titrator	EK434P	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yree CN by Discrete Analyser	EK425G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Hexavalent Chromium - Dissolved	EG454Y	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Major Cations - Dissolved	ED49FY	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK459G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite as N by Discrete Analyser	EK457G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
PAH/Phenols (GC/MS - SIM)	EP475(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Reactive Phosphorus as P-By Discrete Analyser	EK471G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfate (Turbidimetric) as SO3 2- by Discrete Analyser	ED431G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfide as S2-	EK485	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Cyanide By Discrete Analyser	EK426G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH - Semivolatile Yraction	EP471	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH Volatiles/BTEX	EP484	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Volatile Organic Compounds	EP473	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Weak Acid Dissociable Cyanide By Discrete Analyser	EK428G	2	34	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Method Blanks (MB)							
Chloride by Discrete Analyser	ED435G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Mercury by YIMS	EG4F5Y	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Dissolved Metals by ICP-MS - Suite A	EG424A-Y	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yluoride by PC Titrator	EK434P	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Yree CN by Discrete Analyser	EK425G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Hexavalent Chromium - Dissolved	EG454Y	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Major Cations - Dissolved	ED49FY	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK459G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Nitrite as N by Discrete Analyser	EK457G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
PAH/Phenols (GC/MS - SIM)	EP475(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Reactive Phosphorus as P-By Discrete Analyser	EK471G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfate (Turbidimetric) as SO3 2- by Discrete Analyser	ED431G	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Sulfide as S2-	EK485	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Cyanide By Discrete Analyser	EK426G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Total Dissolved Solids (High Level)	EA415H	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH - Semivolatile Yraction	EP471	1	24	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH Volatiles/BTEX	EP484	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Volatile Organic Compounds	EP473	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK428G	2	34	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED435G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Dissolved Mercury by YIMS	EG4F5Y	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Dissolved Metals by ICP-MS - Suite A	EG424A-Y	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Yluoride by PC Titrator	EK434P	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Yree CN by Discrete Analyser	EK425G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Hexavalent Chromium - Dissolved	EG454Y	1	19	**5.3**	**5.0**	✓	ALS QCSF requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK459G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Nitrite as N by Discrete Analyser	EK457G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Reactive Phosphorus as P-By Discrete Analyser	EK471G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Sulfate (Turbidimetric) as SO3 2- by Discrete Analyser	ED431G	1	24	**5.0**	**5.0**	✓	ALS QCSF requirement
Total Cyanide By Discrete Analyser	EK426G	1	16	**6.3**	**5.0**	✓	ALS QCSF requirement
TPH Volatiles/BTEX	EP484	1	15	**6.7**	**5.0**	✓	ALS QCSF requirement
Volatile Organic Compounds	EP473	1	16	**6.3**	**5.0**	✓	ALS QCSF requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK428G	2	34	**5.0**	**5.0**	✓	ALS QCSF requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the 0S EPAUAPHAUAS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA445	WATER	APHA 21st ed. 3544 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Total Dissolved Solids (High Level)	EA415H	WATER	APHA 21st ed.U2534C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 184+/-5C. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Alkalinity by PC Titrator	ED4F7-P	WATER	APHA 21st ed.U2F24 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 3.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Sulfate (Turbidimetric) as SO3 2- by Discrete Analyser	ED431G	WATER	APHA 21st ed.U3544-SO3 Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO3 suspension is measured by a photometer and the SO3-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Chloride by Discrete Analyser	ED435G	WATER	APHA 21st ed.U3544 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 384 nm APHA 21st edition seal method 2 417-1-L april 244F
Major Cations - Dissolved	ED49FY	WATER	APHA 21st ed.UF124; 0SEPA SW 836 - 6414 The ICPAES technique ionises the 4.35um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG424A-Y	WATER	(APHA 21st ed.UF125; 0SEPA SW836 - 6424UALS QWI-EN/EG424): Samples are 4.35 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometerUwhich separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by YIMS	EG4F5Y	WATER	AS F554UAPHA 21st ed. F112 Hg - B (Ylow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 4.35 um filtered prior to analysis. YIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Hexavalent Chromium - Dissolved	EG454Y	WATER	APHA 21st ed.UF544 Cr-B. Samples are 4.35 um filtered prior to analysis. Hexavalent chromium is determined on filtered water sample as received by pH adjustment and colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Yree CN by Discrete Analyser	EK425G	WATER	APHA 21st ed.U3544-CN-C&N Yree Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Total Cyanide By Discrete Analyser	EK426G	WATER	APHA 21st ed.U3544-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Weak Acid Dissociable Cyanide By Discrete Analyser	EK428G	WATER	APHA 21st ed.U3544-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Yluoride by PC Titrator	EK434P	WATER	APHA 21st ed.U3544 Y--C CDTA is added to the sample to provide a uniform ionic strength backgroundUadjust pHU and break up complexes. Yluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Ammonia as N by Discrete analyser	EK455G	WATER	APHA 21st ed.U3544-NHF G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Ammonium as N	EK455G-NH3	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed.U3544-NHF G. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK457G	WATER	APHA 21st ed.U3544-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK458G	WATER	APHA 21st ed.U3544-NOF- Y. Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK459G	WATER	APHA 21st ed.U3544-NOF- Y. Combined oxidised Nitrogen (NO2+NOF) is determined by Cadmium Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK471G	WATER	APHA 21st ed.U3544-P Y Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Sulfide as S2-	EK485	WATER	APHA 21st ed.U3544-S2- D Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. After the supernatant is discardedUthe resultant precipitate is then coloured using methylene blue indicator and measured using 0V-VIS detection at 663nm. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Ionic Balance by PCT DA and ICPAES	EN455 - PG	WATER	APHA 21st Ed. 14F4Y. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include AlkalinityUChloride and Sulfate which determined by PCT and DA. The Cations are determined by ICPAES. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
TPH - Semivolatile Yraction	EP471	WATER	0SEPA SW 836 - 8415A The sample extract is analysed by Capillary GC/YID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Volatile Organic Compounds	EP473	WATER	0SEPA SW 836 - 8264B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP475(SIM)	WATER	0SEPA SW 836 - 8274D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
TPH Volatiles/BTEX	EP484	WATER	0SEPA SW 836 - 8264B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
Yree Cyanide	EK425-PR	WATER	APHA 21st ed.U3544 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solutionUand quanitified by colourimetry on YIA. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Total Cyanide	EK426-PR	WATER	APHA 21st ed.U3544 CN- C&N. The sample is distilled with H2SO3 releasing all bound cyanides as HCN. The CN is trapped in a caustic solutionUand quanitified by colourimetry on YIA. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK428-PR	WATER	APHA 21st ed.U3544 CN- I&N. The sample is distilled with Acetic acidUselectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solutionUand quanitified by colourimetry on YIA. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2)
Separatory Yunnel Extraction of Liquids	ORG13	WATER	0SEPA SW 836 - F514B 544 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 64mL DCM for each extract. The resultant extracts are combinedUdehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(F) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 34 mL VOC vial for sparging.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on 0SEPA SW846 or ALS-QWI/EN/F8 (in the absence of specific 0SEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP473A: Monocyclic Aromatic Hydrocarbons	2476525-441	----	**n-Propylbenzene**	14F-65-1	124 %	74-124%	**Recovery greater than upper control limit**
EP473A: Monocyclic Aromatic Hydrocarbons	2476525-441	----	**1.3.5-Trimethylbenzene**	148-67-8	119 %	71-119%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED431G: Sulfate (Turbidimetric) as SO3 2- by DA	EM1143121-442	Anonymous	**Sulfate as SO4 - Turbidimetric**	13848-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK459G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EM1143121-442	Anonymous	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)	*Extraction / Preparation*			*Analysis*		
	Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005: pH						
Clear Plastic Bottle - Natural GW29	----	----	----	21-APR-2411	18-APR-2411	**3**
Clear Plastic Bottle - Natural GWF4U, GW8U, GW28U, GWF2U, GWF8U, D0P2U, GWF7	----	----	----	21-APR-2411	19-APR-2411	**2**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Yrequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104286**	eo:	f 13Lb40
Amendment	: **1**		
nR mC	f **ENVIRONMENTAL EARTH SCIENCES**	r et LyeCLyi	f EmDyLmu : mGeP3c vDgyLm3M: P LRym
n LmGeAC	f MV3c I J Sc 3W MEh	n LmGeAC	f neyLP3d eRg.
l COy. gg	f BXB2X53FFTY sXX, h n VI U3J Sh p3 7 h, VI r S 3Y011	l COy. gg	f 43d : gGePBVO3h - ymoDeP 3J Sh 3 RgGyeRe3Y1j 1
E@ evP	f Oeu : gw : : gvB v+	E@ evP	f AeyLPB eRg. w eRg: mDyLBALu
, : P - . Lm	f 9I 13Bl aj 1l l l	, : P - . Lm	f 9I 1@@T483Bl 0a
seAguvP	f 9I 130Y3Bl aj 1a44	seAguvP	f 9I 1@@T483Bl 01
yLz AC	f F100j 43 r 2EV, 3 l VK3GI h3d XVKh	Qn 3 : D P	f NE M318883h A : ORP 32 (Y)3emO3 r h3Qn h Y3y. qRwy. u : mC
XyO. y3mRu t : y	f @@@@		
n@@3mRu t : y	f @@@@	c eC 3h eu - P g3V : A vD O	f F1@ V@011
h eu - P y	f @@@@	SggR 3c eC	f Y0@l U@011
h vC	f @@@@		
		NLBLbgeu - P g3y. A vD O	f YT
QRLC 3mRu t : y	f ME/01T/113JY	NLBLbgeu - P g3emeP g: O	f YT

, . vg3 y. - LyC3 gR - : yg: O. g3 emi 3 - y. DLRg3 y. - LyC(g)3 6 vC 3 C vg3 y. b y. mA: B3 V: gRRG3 e - - P 3 CL3 C : 3 geu - P. (g)3 eg3 gRt u vCC OB3 I P3 - eo: g3 Lb3 C vg3 y. - LyC3 . eD. 3 t : : m3 A : Ak: O3 emO3 e - - yLD. O3 bLy y. P. eg: B3

, . vg3n : yObAeC 3 Lb3 meP gvg3ALmGevmg3C : 3bLPP. 6 vmo3mbLyu eOLmf

- G: m yeP3n Lu u : mGg
- I meP OAeP3V : gRRG
- h RyyLoeC 3n LmGyLP3r vu vGg

NI , I 3 AAy. OxC O3r et LyeCLyi 3aFT 3
, . vg3 OLARu : mO3 . eg3 t : : m3 : P AGyLmAeP P 3 gvom O3 t i 3 C : 3 eRC Lyv+: O3 gvomeCLyv g3 vmOAeC O3 t : P.6 B3 EP AGyLmA3 gvommo3 . eg3 t : : m Aeyv. O3LRO3m3ALu - ReemA: 36 vC 3 - yLA: ORy. g3g - : Abv O3m3F 13n s V3 eyO3l 1B

Signatories	*Position*	*Accreditation Category*
c vRemOs : ymemOL	h : mLy3BrLyoemA3n . : u vgC	M: P LRym 3BrLyoemAg
EyvA3n . eR	M: GeRg3 : eu 3r : eO. y	M: P LRym 3BrLyoemAg
H: yu em3r vm	r et LyeCLyi 3n LLyOmeCLy	M: P LRym 3BrLyoemAg
NemAi 3d emo	h : mLy3n : u vDLReOP 3BmgGRu : mO3n . : u vgC	M: P LRym 3XyoemAg
Nvkkv3n C - mv 6 gkv	h : mLy3BrLyoemA3BmgGRu : mO3n . : u vgC	M: P LRym 3BrLyoemAg
h C D. m3MAGyeC	r et LyeCLyi 3Memeo: y	M: P LRym 3XyoemAg
5 vmot vm3r vm	h : mLy3XyoemA3n . : u vgC	M: P LRym 3XyoemAg

WORLD RECOGNISED ACCREDITATION

NATA

eo:	f Y3Lb840
d Lyk3XyO: y	f EM1104Fal 3 u : mOu : m03l
nR mC	f ENJS/VXNMEN, I r 3EI V, H3n n 3ENn Eh
yLz AC	f F100j 43 r 2EV, 3 I VK3GI h 3d XVKh

General Comments

, . : 3 emeP:0AeP3 - yLA: ORy: g3 Rg: O3 t i 3 C : 3 EmDuyLmu : m0eP3 c vDugvLm8 . eD: 3 t : : m8 O: D: P:- : O3 byLu 3 : g0et Rg. : O3 vmC ymeOLmeHP 3 y: ALomv+: O3 - yLA: ORy: g3 gRA: 3 eg3 C Lg: 3 - Rt Rg. : O3 t i 3 C : 3 7 hE I p3 I HI p3 I h 3 emO3 NE MB3 Sn8 . LRg: O: D: P:- : O3 - yLA: ORy: g3ey: 3 u - P:i : O3m8C : 3et g: mA: 3Lb8OLARu : mC O8gGemOeyOg3LyOi 3AR: m03y: qR: g03

d . : y: 3u LvgORy: 3O: C yu vme0Lm8 eg3 : : m8 - : yuLyu : Op8y: gRP03ey: 3y: - LyC O8Lm8e3Oyi 36 : vo. O3t egvgB

d . : y: 3e3y: - LyC O0P:gg3C em8(<)3y: gRP03g3 vo. : yXC em8C : 3 XVp8C vg3u ei 3 : 3OR 3L3 ywu eyi 3geu - P:3 xOyeAOOvo: g0eC 3OvPROLm8emO'Ly3mgRdbv m03geu - P:3tLy3emeP:gvgB

d . : y: 3C : 3 XV3Lb8e3y: - LyC O8y: gRP03Odb ygb3yLu 3gGemOeyO8 XVp8C vg3u ei 3 : 3OR 3L3 vo. 3u LvgORy: 3ALmC mp3mgRdbAv m03geu - P:3(y: ORA: O06 : vo. O3 u - P:i : O)3Ly3u eOvx3mC yb y: mA: B

d . : m8geu - Pmo3Ou : 3mtLyu e0Lm8g3mLO3 yLDvO: O8 i 3C : 3AR: m0p3geu - Pmo3OeC g3ey: 3g. L6 m86 vC LRO3e3Ou : 3ALu - Lm: m0B8m8C : g: 3mgGemA: gp8C : 30u : 3ALu - Lm: m03 eg3 : : m8eggRu : O8 i 3C : 3et LyeOLyi 3tLy3 yLA: ggvmo3 Ry- Lg: gB

K: i 3 n l h 3NRu t : y3=3n l h 3y: ovgGyi 3mRu t : y3byLu 3OeGet eg: 3u evmGevm O8 i 3n . : u vAeP3 t gGyeAGg3n : yDA: gB3 . : 3n . : u vAeP3 t gGyeAGg3n : yDA: 3g3e3OLDgvLm8Lb8C : 3 u : yvAem3n . : u vAeP3nLAv CB
r XV3=3 vu vG3Lb3y: - LyGmo
^3=3 . vg3y: gRP03g3ALu - RC O8byLu 3mOLDvORePBemeP:C 3O: C AGLmg3eG3Ly3et LD: 3C : 3P: D: P3Lb3y: - LyGmo

- **30/5/11: This report has been amended and re-released to allow the reporting of additional analytical data.**
- **EG035F: Positive mercury results for EM1104286 # 2 - 5, 16 - 17, and 19 - 21 were confirmed by re-preparation and re-analysis.**
- **EP080/074/075(SIM): Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.**
- **Insufficient time provided to perform sulphide analysis within holding time.**
- **Ionic Balance out of acceptable limits due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate and major cations - calcium, magnesium, potassium, sodium and ammonia as N..**
- **Samples were filtered through a 0.45um filter prior to the dissolved metals analysis.**

Analytical Results

hRt @le9x: WATER			Client sample ID	GW3	GW4	GW9	GW10	GW11
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit	EM1104286-001	EM1104286-002	EM1104286-003	EM1104286-004	EM1104286-005
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	6.60	7.11	6.65	5.23	5.55
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn@10@10	T	u o/r	3410	1010	548	590	288
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX@10@01	1	u o/r	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	242	307	86	8	10
Total Alkalinity as CaCO3	@@@@	1	u o/r	242	307	86	8	10
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	2070	222	54	303	93
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	64	57	150	65	54
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	232	50	4	4	<1
Magnesium	j 4Y8@T@	1	u o/r	43	20	3	3	<1
Sodium	j 440@Y@	1	u o/r	62	180	168	192	89
Potassium	j 440@8@	1	u o/r	16	26	4	3	1
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	<0B01	<0B01	<0B01	0.01	0.03
Arsenic	j 440@a@	0B001	u o/r	0.010	0.120	0.004	0.006	0.002
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
Cobalt	j 440@a@	0B001	u o/r	0.021	0.001	<0B001	0.001	<0B001
Copper	j 440@0@	0B001	u o/r	0.001	0.006	0.001	0.007	0.002
Lead	j 4Y8@F@	0B001	u o/r	<0B001	0.001	<0B001	<0B001	<0B001
Manganese	j 4Y8@l @	0B001	u o/r	4.18	0.010	0.007	0.022	0.002
Nickel	j 440@F@	0B001	u o/r	0.014	0.002	0.004	0.037	<0B001
Selenium	j j aF@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
Zinc	j 440@l @	0B00T	u o/r	0.017	<0B00T	0.014	0.032	<0B00T
Boron	j 440@F@	0B0T	u o/r	1.30	0.05	0.45	0.18	0.26
Iron	j 4Y8@8@	0B0T	u o/r	27.0	0.23	<0B0T	<0B0T	<0B0T
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	<0B0001	0.0002	0.0001	0.0002	0.0002
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	0.005	0.100	<0B004	<0B004	<0B004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

hRt @le@x: **WATER**

			Client sample ID	GW3	GW4	GW9	GW10	GW11
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104286-001**	**EM1104286-002**	**EM1104286-003**	**EM1104286-004**	**EM1104286-005**
EK026G: Total Cyanide By Discrete Analyser - Continued								
Total Cyanide	Tj @F@	0B004	u o/r	**0.070**	**0.320**	<0B004	<0B004	**0.009**
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	@@@@	0B004	u o/r	**0.009**	**0.159**	<0B004	<0B004	<0B004
EK040P: Fluoride by PC Titrator								
Fluoride	1l 8a4@a@	0B1	u o/r	**1.3**	**0.6**	**0.4**	<0B1	<0B1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	j l l 4@1@	0B01	u o/r	**660**	**0.29**	**0.52**	**0.43**	**0.04**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	@@@@	0B01	u o/r	<0B01	**0.09**	**0.01**	<0B01	**0.01**
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14j 8j @T@	0B01	u o/r	<0B01	**15.7**	**21.0**	<0B01	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	@@@@	0B01	u o/r	<0B01	**15.8**	**21.0**	<0B01	**0.04**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	@@@@	0B01	u o/r	<0B01	**0.06**	<0B01	<0B01	<0B01
EK085M: Sulfide as S2-								
Sulfide as S2-	1a48l @T@	0B1	u o/r	<0B1	<0B1	<0B1	<0B1	<0B1
EN055: Ionic Balance								
^ Total Anions	@@@@	0B01	u : q/r	**49.8**	**12.4**	**7.09**	**8.31**	**3.66**
^ Total Cations	@@@@	0B01	u : q/r	@@@@	@@@@	**7.83**	**8.90**	**3.89**
Total Cations	@@@@	0B01	u : q/r	**54.9**	**2.05**	@@@@	@@@@	@@@@
^ Ionic Balance	@@@@	0B01	%	@@@@	**1.10**	**4.92**	**3.42**	**3.06**
Ionic Balance	@@@@	0B01	%	**4.61**	@@@@	@@@@	@@@@	@@@@
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100@F@	T	µo/r	<T	<T	<T	<T	<T
Isopropylbenzene	8a@F@	T	µo/r	<T	<T	<T	<T	<T
n-Propylbenzene	10Y@T@	T	µo/r	<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r	<T	<T	<T	<T	<T
sec-Butylbenzene	1YT@a@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r	<T	<T	<T	<T	<T
tert-Butylbenzene	8a@l @	T	µo/r	<T	<T	<T	<T	<T
p-Isopropyltoluene	88@j @	T	µo/r	<T	<T	<T	<T	<T
n-Butylbenzene	104@1@	T	µo/r	<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds								
Vinyl Acetate	10a@T@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0

Analytical Results

hRt @le9x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW3	GW4	GW9	GW10	GW11
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-001	EM1104286-002	EM1104286-003	EM1104286-004	EM1104286-005
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<T	<T	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<T	<T	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<T	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<T	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<T	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<T	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<T	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<T	<T	<T

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW3	GW4	GW9	GW10	GW11
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-001	EM1104286-002	EM1104286-003	EM1104286-004	EM1104286-005
EP074E: Halogenated Aliphatic Compounds - Continued								
Hexachlorobutadiene	aj @a@	T	µo/r	<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<T	<T	<T	<T	<T
Bromobenzene	10a@l @	T	µo/r	<T	<T	<T	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r	<T	<T	<T	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r	<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r	<T	<T	<T	<T	<T
EP074G: Trihalomethanes								
Chloroform	l j @l @	T	µo/r	<T	<T	<T	<T	<T
Bromodichloromethane	j T@j @	T	µo/r	<T	<T	<T	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r	<T	<T	<T	<T	<T
Bromoform	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	81@0@	1B0	µo/r	**1.2**	<1B0	<1B0	<1B0	<1B0
Acenaphthylene	F0a@l @	1B0	µo/r	<1B0	**1.0**	<1B0	<1B0	<1B0
Acenaphthene	aY@F@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Fluorene	al @Y@	1B0	µo/r	**1.0**	<1B0	<1B0	<1B0	<1B0
Phenanthrene	aT@1@	1B0	µo/r	**3.4**	**6.2**	<1B0	<1B0	<1B0
Anthracene	1F0@F@	1B0	µo/r	**1.1**	**2.1**	<1B0	<1B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r	**2.4**	**8.4**	<1B0	<1B0	<1B0
Pyrene	1F8@0@	1B0	µo/r	**2.0**	**7.8**	<1B0	<1B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r	<1B0	**2.8**	<1B0	<1B0	<1B0
Chrysene	F1a@1@	1B0	µo/r	<1B0	**2.3**	<1B0	<1B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r	<1B0	**2.7**	<1B0	<1B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r	<1B0	**1.0**	<1B0	<1B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r	<0B	**2.2**	<0B	<0B	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r	<1B0	**1.4**	<1B0	<1B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r	<1B0	**1.4**	<1B0	<1B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@@	0BT	µo/r	**11.1**	**39.3**	<1Bl	<1Bl	<1Bl
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	@@@@	F0	µo/r	<F0	<F0	<F0	<F0	<F0
C10 - C14 Fraction	@@@@	T0	µo/r	**420**	<T0	<T0	<T0	<T0

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW3	GW4	GW9	GW10	GW11
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-001	EM1104286-002	EM1104286-003	EM1104286-004	EM1104286-005
EP080/071: Total Petroleum Hydrocarbons - Continued								
C15 - C28 Fraction	@@@	100	µo/r	1440	570	<100	<100	510
C29 - C36 Fraction	@@@	T0	µo/r	150	510	<T0	60	260
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	2010	1080	<T0	60	770
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@	F0	µo/r	<F0	<F0	<F0	<F0	<F0
^ C6 - C10 Fraction minus BTEX (F1)	@@@	F0	µo/r	<F0	<F0	<F0	<F0	<F0
>C10 - C16 Fraction	@@@	100	µo/r	610	<100	<100	<100	<100
>C16 - C34 Fraction	@@@	100	µo/r	1300	910	<100	130	670
>C34 - C40 Fraction	@@@	100	µo/r	<100	290	<100	<100	120
^ >C10 - C40 Fraction (sum)	@@@	100	µo/r	1910	1200	<100	130	790
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	2	<1	<1	<1	<1
Toluene	10a@a@	F	µo/r	<F	<F	<F	<F	<F
Ethylbenzene	100@1@	F	µo/r	<F	<F	<F	<F	<F
meta- & para-Xylene	10a@a@3l0l @F@	F	µo/r	3	<F	<F	<F	<F
ortho-Xylene	8T@j @	F	µo/r	<F	<F	<F	<F	<F
^ Total Xylenes	1YY0@0@	F	µo/r	3	<F	<F	<F	<F
^ Sum of BTEX	@@@	1	µo/r	5	<1	<1	<1	<1
Naphthalene	81@0@	T	µo/r	<T	<T	<T	<T	<T
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	82.4	86.4	92.9	89.1	106
Toluene-D8	F0Yj @l @	0Bl	%	88.4	90.1	95.2	91.1	108
4-Bromofluorobenzene	4l 0@0@	0Bl	%	78.7	81.8	87.4	81.5	98.0
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	31.3	37.1	35.2	37.8	15.2
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	52.3	59.2	69.2	76.3	27.9
2.4.6-Tribromophenol	11a@8@	0Bl	%	95.2	83.0	73.4	93.2	73.3
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	71.0	72.9	71.9	89.0	37.0
Anthracene-d10	1j 18@l @	0Bl	%	85.1	85.6	74.1	78.4	84.5
4-Terphenyl-d14	1j 1a@1@	0Bl	%	88.8	90.3	90.8	93.8	91.2
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	92.3	102	109	106	125
Toluene-D8	F0Yj @l @	0Bl	%	89.8	95.2	101	96.4	115
4-Bromofluorobenzene	4l 0@0@	0Bl	%	81.2	82.6	89.8	81.0	101

Analytical Results

hRt @le@x: WATER			Client sample ID	GW12	GW13	GW14	GW15	GW16
			Client sampling date / time	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit	EM1104286-006	EM1104286-007	EM1104286-008	EM1104286-009	EM1104286-010
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	6.91	6.25	6.67	6.11	7.20
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn@10@10	T	u o/r	546	406	368	364	156
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX@10@01	1	u o/r	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	149	27	82	26	57
Total Alkalinity as CaCO3	@@@@	1	u o/r	149	27	82	26	57
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	142	126	111	191	46
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	80	75	55	<1	13
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	2	4	23	12	6
Magnesium	j 4Y8@T@	1	u o/r	1	4	27	12	6
Sodium	j 440@Y@	1	u o/r	202	111	43	101	41
Potassium	j 440@8@	1	u o/r	4	10	22	13	7
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	0.03
Arsenic	j 440@a@	0B001	u o/r	0.008	0.003	0.005	<0B001	0.001
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
Cobalt	j 440@a@	0B001	u o/r	<0B001	<0B001	0.004	0.008	<0B001
Copper	j 440@0@	0B001	u o/r	0.005	0.002	0.001	0.002	<0B001
Lead	j 4Y8@F@	0B001	u o/r	<0B001	0.008	<0B001	0.001	<0B001
Manganese	j 4Y8@l @	0B001	u o/r	<0B001	0.014	0.061	0.058	0.002
Nickel	j 440@F@	0B001	u o/r	0.007	0.003	0.005	0.010	<0B001
Selenium	j j aF@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
Zinc	j 440@l @	0B00T	u o/r	<0B00T	0.018	0.007	0.016	0.045
Boron	j 440@F@	0B0T	u o/r	0.36	0.87	0.94	1.02	0.51
Iron	j 4Y8@8@	0B0T	u o/r	<0B0T	<0B0T	<0B0T	<0B0T	0.08
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	<0B004	<0B004	<0B004	<0B004	<0B004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

hRt @le@x: WATER				Client sample ID	GW12	GW13	GW14	GW15	GW16
				Client sampling date / time	18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit		EM1104286-006	EM1104286-007	EM1104286-008	EM1104286-009	EM1104286-010
EK026G: Total Cyanide By Discrete Analyser - Continued									
Total Cyanide	Tj @F@	0B004	u o/r		<0B004	0.008	0.014	0.006	<0B004
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	@@@	0B004	u o/r		<0B004	<0B004	<0B004	<0B004	<0B004
EK040P: Fluoride by PC Titrator									
Fluoride	1l 8a4@a@	0B1	u o/r		0.6	<0B1	<0B1	<0B1	<0B1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	j l l 4@1@	0B01	u o/r		<0B01	0.07	0.85	0.19	0.01
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	@@@	0B01	u o/r		<0B01	<0B01	<0B01	<0B01	<0B01
EK058G: Nitrate as N by Discrete Analyser									
^ Nitrate as N	14j 8j @T@	0B01	u o/r		1.55	0.05	0.12	0.06	0.33
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	@@@	0B01	u o/r		1.55	0.05	0.12	0.06	0.33
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	@@@	0B01	u o/r		<0B01	<0B01	<0B01	<0B01	<0B01
EK085M: Sulfide as S2-									
Sulfide as S2-	1a48l @T@	0B1	u o/r		<0B1	<0B1	<0B1	<0B1	<0B1
EN055: Ionic Balance									
^ Total Anions	@@@	0B01	u : q/r		8.19	5.27	5.51	4.50	2.49
^ Total Cations	@@@	0B01	u : q/r		9.12	5.71	5.80	6.38	2.75
^ Ionic Balance	@@@	0B01	%		5.34	3.92	2.50	17.2	5.04
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100@F@	T	µo/r		<T	<T	<T	<T	<T
Isopropylbenzene	8a@F@	T	µo/r		<T	<T	<T	<T	<T
n-Propylbenzene	10Y@T@	T	µo/r		<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r		<T	<T	<T	<T	<T
sec-Butylbenzene	1YT@a@	T	µo/r		<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r		<T	<T	<T	<T	<T
tert-Butylbenzene	8a@l @	T	µo/r		<T	<T	<T	<T	<T
p-Isopropyltoluene	88@j @	T	µo/r		<T	<T	<T	<T	<T
n-Butylbenzene	104@1@	T	µo/r		<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds									
Vinyl Acetate	10a@T@	T0	µo/r		<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r		<T0	<T0	<T0	<T0	<T0
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r		<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r		<T0	<T0	<T0	<T0	<T0

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW12	GW13	GW14	GW15	GW16
				Client sampling date / time: 18@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-006	EM1104286-007	EM1104286-008	EM1104286-009	EM1104286-010
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<T	<T	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<T	<T	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<T	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<T	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<T	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<T	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<T	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<T	<T	<T
Hexachlorobutadiene	aj @a@	T	µo/r	<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<T	<T	<T	<T	<T

Analytical Results

hRt @le9x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW12	GW13	GW14	GW15	GW16
				Client sampling date / time: 18@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00
				EM1104286-006	EM1104286-007	EM1104286-008	EM1104286-009	EM1104286-010
EP074F: Halogenated Aromatic Compounds - Continued								
Bromobenzene	10a@ @	T	µo/r	<T	<T	<T	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r	<T	<T	<T	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r	<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10l @ @	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r	<T	<T	<T	<T	<T
EP074G: Trihalomethanes								
Chloroform	l j @ @	T	µo/r	<T	<T	<T	<T	<T
Bromodichloromethane	j T@ @	T	µo/r	<T	<T	<T	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r	<T	<T	<T	<T	<T
Bromoform	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	81@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Acenaphthylene	F0a@ @	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Acenaphthene	aY@F@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Fluorene	al @Y@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Phenanthrene	aT@1@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Anthracene	1F0@F@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Pyrene	1F8@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Chrysene	F1a@1@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r	<0BT	<0BT	<0B	<0B	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@	0BT	µo/r	<1Bl	<1Bl	<1Bl	<1Bl	<1Bl
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	@@@	F0	µo/r	<F0	<F0	<F0	<F0	<F0
C10 - C14 Fraction	@@@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
C15 - C28 Fraction	@@@	100	µo/r	<100	<100	<100	**230**	<100
C29 - C36 Fraction	@@@	T0	µo/r	**50**	<T0	<T0	<T0	<T0
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	**50**	<T0	<T0	**230**	<T0

Analytical Results

hRt @le@x: WATER

	Client sample ID	GW12	GW13	GW14	GW15	GW16
	Client sampling date / time	18@ V@0113ITf00	F0@ V@0113ITf00	F0@ V@0113ITf00	F0@ V@0113ITf00	F0@ V@0113ITf00
Compound / CAS Number / LOR / Unit		EM1104286-006	EM1104286-007	EM1104286-008	EM1104286-009	EM1104286-010
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft						
C6 - C10 Fraction @@@ F0 µo/r		<F0	<F0	<F0	<F0	<F0
^ C6 - C10 Fraction minus BTEX (F1) @@@ F0 µo/r		<F0	<F0	<F0	<F0	<F0
>C10 - C16 Fraction @@@ 100 µo/r		<100	<100	<100	<100	<100
>C16 - C34 Fraction @@@ 100 µo/r		<100	<100	<100	250	<100
>C34 - C40 Fraction @@@ 100 µo/r		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum) @@@ 100 µo/r		<100	<100	<100	250	<100
EP080: BTEXN						
Benzene j 1@Y@ 1 µo/r		<1	<1	<1	<1	<1
Toluene 10a@a@ F µo/r		<F	<F	<F	<F	<F
Ethylbenzene 100@1@ F µo/r		<F	<F	<F	<F	<F
meta- & para-Xylene 10a@a@3I0I @F@ F µo/r		<F	<F	<F	<F	<F
ortho-Xylene 8T@j @ F µo/r		<F	<F	<F	<F	<F
^ Total Xylenes 1YY0@0@ F µo/r		<F	<F	<F	<F	<F
^ Sum of BTEX @@@ 1 µo/r		<1	<1	<1	<1	<1
Naphthalene 81@0@ T µo/r		<T	<T	<T	<T	<T
EP074S: VOC Surrogates						
1.2-Dichloroethane-D4 1j 0I 0@j @ 0B %		97.8	98.9	79.8	89.2	80.2
Toluene-D8 F0Yj @ @ 0B %		100	97.9	80.4	92.1	78.3
4-Bromofluorobenzene 4I 0@0@ 0B %		91.7	90.6	72.6	83.9	72.4
EP075(SIM)S: Phenolic Compound Surrogates						
Phenol-d6 1Y1Fj @a@ 0B %		19.2	25.5	44.3	32.4	18.4
2-Chlorophenol-D4 8Y8T1@Y@ 0B %		27.2	55.6	90.8	65.2	38.4
2.4.6-Tribromophenol 11a@8@ 0B %		65.2	83.4	123	92.1	57.3
EP075(SIM)T: PAH Surrogates						
2-Fluorobiphenyl YF1@0@ 0B %		40.6	64.8	107	78.4	45.3
Anthracene-d10 1j 18@I @ 0B %		70.4	85.5	108	80.3	70.6
4-Terphenyl-d14 1j 1a@1@ 0B %		86.5	96.3	138	107	79.0
EP080S: TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4 1j 0I 0@j @ 0B %		115	117	94.6	105	94.2
Toluene-D8 F0Yj @ @ 0B %		106	104	85.0	97.4	83.0
4-Bromofluorobenzene 4I 0@0@ 0B %		91.0	91.0	71.9	84.3	73.0

Analytical Results

hRt @le9x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW21	GW22	GW23	GW24	GW25
Client sampling date / time				F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00
				EM1104286-011	EM1104286-012	EM1104286-013	EM1104286-014	EM1104286-015
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	5.44	6.17	6.52	7.25	6.45
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	1590	662	1280	4430	360
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX @10@01	1	u o/r	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	39	238	326	679	62
Total Alkalinity as CaCO3	@@@@	1	u o/r	39	238	326	679	62
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	981	209	388	2340	128
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	74	90	38	42	100
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	277	94	22	55	12
Magnesium	j 4Y8@T@	1	u o/r	82	28	2	38	8
Sodium	j 440@Y@	1	u o/r	24	111	39	67	132
Potassium	j 440@8@	1	u o/r	38	35	8	21	11
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	0.14	<0B01	<0B01	<0B01	<0B01
Arsenic	j 440@a@	0B001	u o/r	0.156	0.008	0.077	0.039	0.002
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
Cobalt	j 440@a@	0B001	u o/r	0.079	0.003	0.002	0.001	<0B001
Copper	j 440@0@	0B001	u o/r	0.004	0.003	<0B001	0.004	0.003
Lead	j 4Y8@F@	0B001	u o/r	0.010	0.006	<0B001	0.002	<0B001
Manganese	j 4Y8@l @	0B001	u o/r	2.19	0.045	0.037	0.019	0.014
Nickel	j 440@F@	0B001	u o/r	0.017	0.053	0.041	0.012	0.003
Selenium	j j aF@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
Zinc	j 440@l @	0B00T	u o/r	0.082	0.041	0.033	0.013	<0B00T
Boron	j 440@F@	0B0T	u o/r	1.64	0.77	1.14	0.32	1.00
Iron	j 4Y8@8@	0B0T	u o/r	53.8	0.06	3.69	0.13	<0B0T
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	<0B004	<0B004	<0B004	0.010	<0B004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW21	GW22	GW23	GW24	GW25
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-011	EM1104286-012	EM1104286-013	EM1104286-014	EM1104286-015
EK026G: Total Cyanide By Discrete Analyser - Continued								
Total Cyanide	Tj @F@	0B04	u o/r	0.020	0.165	0.086	0.219	0.008
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	@@@@	0B04	u o/r	<0B04	0.006	0.006	0.021	<0B04
EK040P: Fluoride by PC Titrator								
Fluoride	1l 8a4@a@	0B1	u o/r	0.4	0.6	0.1	0.3	<0B1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	j l l 4@1@	0B01	u o/r	26.8	0.99	201	854	2.11
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	@@@@	0B01	u o/r	<0B01	0.14	0.05	0.02	<0B01
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14j 8j @T@	0B01	u o/r	0.10	0.79	0.48	5.35	0.24
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	@@@@	0B01	u o/r	0.10	0.93	0.54	5.37	0.24
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	@@@@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
EK085M: Sulfide as S2-								
Sulfide as S2-	1a48l @T@	0B1	u o/r	<0B1	<0B1	<0B1	<0B1	<0B1
EN055: Ionic Balance								
^ Total Anions	@@@@	0B01	u : q/r	23.3	11.6	15.7	63.5	6.72
^ Total Cations	@@@@	0B01	u : q/r	22.6	12.7	@@@@	@@@@	7.32
Total Cations	@@@@	0B01	u : q/r	@@@@	@@@@	14.3	56.8	@@@@
^ Ionic Balance	@@@@	0B01	%	1.47	4.43	@@@@	@@@@	4.25
Ionic Balance	@@@@	0B01	%	@@@@	@@@@	5.54	5.59	@@@@
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100@F@	T	µo/r	<T	<T	<T	193	<T
Isopropylbenzene	8a@F@	T	µo/r	<T	<T	<T	<100	<T
n-Propylbenzene	10Y@T@	T	µo/r	<T	<T	<T	<100	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r	<T	<T	<T	<100	<T
sec-Butylbenzene	1YT@a@	T	µo/r	<T	<T	<T	<100	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r	<T	<T	<T	185	<T
tert-Butylbenzene	8a@l @	T	µo/r	<T	<T	<T	<100	<T
p-Isopropyltoluene	88@j @	T	µo/r	<T	<T	<T	<100	<T
n-Butylbenzene	104@1@	T	µo/r	<T	<T	<T	<100	<T
EP074B: Oxygenated Compounds								
Vinyl Acetate	10a@T@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r	<T0	<T0	<T0	<1000	<T0

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW21	GW22	GW23	GW24	GW25
Client sampling date / time				F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-011	EM1104286-012	EM1104286-013	EM1104286-014	EM1104286-015
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<T	<100	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<T	<100	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<T	<100	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<T	<100	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<T	<100	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<T	<100	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<T0	<1000	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<T0	<1000	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<T	<100	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<T	<100	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<T	<100	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<T	<100	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<T	<100	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<T	<100	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<T	<100	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<T	<100	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<T	<100	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<T	<100	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<T	<100	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<T	<100	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<T	<100	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<T	<100	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<T	<100	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<T	<100	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<T	<100	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<T	<100	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<T	<100	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<T	<100	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<T	<100	<T

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW21	GW22	GW23	GW24	GW25
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-011	EM1104286-012	EM1104286-013	EM1104286-014	EM1104286-015
EP074E: Halogenated Aliphatic Compounds - Continued								
Hexachlorobutadiene	aj @a@	T	µo/r	<T	<T	<T	<100	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<T	<T	<T	<100	<T
Bromobenzene	10a@l @	T	µo/r	<T	<T	<T	<100	<T
2-Chlorotoluene	8T@8@	T	µo/r	<T	<T	<T	<100	<T
4-Chlorotoluene	10l @Y@	T	µo/r	<T	<T	<T	<100	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r	<T	<T	<T	<100	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r	<T	<T	<T	<100	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r	<T	<T	<T	<100	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r	<T	<T	<T	<100	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r	<T	<T	<T	<100	<T
EP074G: Trihalomethanes								
Chloroform	l j @ @	T	µo/r	<T	<T	<T	<100	<T
Bromodichloromethane	j T@j @	T	µo/r	<T	<T	<T	<100	<T
Dibromochloromethane	1F4@a@	T	µo/r	<T	<T	<T	<100	<T
Bromoform	j T@T@	T	µo/r	<T	<T	<T	<100	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	81@0@	1B0	µo/r	<1B0	<1B0	**1.2**	**1820**	<1B0
Acenaphthylene	F0a@l @	1B0	µo/r	<1B0	<1B0	<1B0	**58.1**	<1B0
Acenaphthene	aY@F@	1B0	µo/r	<1B0	<1B0	**2.4**	<10B0	<1B0
Fluorene	al @Y@	1B0	µo/r	<1B0	<1B0	<1B0	**20.2**	<1B0
Phenanthrene	aT@1@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Anthracene	1F0@F@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Pyrene	1F8@0@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Chrysene	F1a@1@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r	<0B	<0B	<0B	<TB	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r	<1B0	<1B0	<1B0	<10B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@@	0BT	µo/r	<1BF	<1BF	**3.6**	**1900**	<1BF
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	@@@@	F0	µo/r	<F0	<F0	**70**	**9780**	<F0
C10 - C14 Fraction	@@@@	T0	µo/r	<T0	<T0	**380**	**14200**	<T0

Analytical Results

hRt @le@x: WATER			Client sample ID	GW21	GW22	GW23	GW24	GW25
			Client sampling date / time	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00
Compound	*CAS Number*	*LOR*	*Unit*	EM1104286-011	EM1104286-012	EM1104286-013	EM1104286-014	EM1104286-015
EP080/071: Total Petroleum Hydrocarbons - Continued								
C15 - C28 Fraction	@@@	100	µo/r	<100	<100	1250	6120	120
C29 - C36 Fraction	@@@	T0	µo/r	<T0	<T0	170	220	70
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	<T0	<T0	1800	20500	190
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@	F0	µo/r	<F0	<F0	120	9720	<F0
^ C6 - C10 Fraction minus BTEX (F1)	@@@	F0	µo/r	<F0	<F0	90	<F000	<F0
>C10 - C16 Fraction	@@@	100	µo/r	<100	<100	550	14600	<100
>C16 - C34 Fraction	@@@	100	µo/r	<100	<100	1160	4670	160
>C34 - C40 Fraction	@@@	100	µo/r	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	@@@	100	µo/r	<100	<100	1710	19300	160
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	<1	<1	16	6350	<1
Toluene	10a@a@	F	µo/r	<F	<F	<F	318	<F
Ethylbenzene	100@1@	F	µo/r	<F	<F	13	111	<F
meta- & para-Xylene	10a@a@3l 0l @F@	F	µo/r	<F	<F	<F	1550	<F
ortho-Xylene	8T@j @	F	µo/r	<F	<F	3	739	<F
^ Total Xylenes	1YY0@0@	F	µo/r	<F	<F	3	2290	<F
^ Sum of BTEX	@@@	1	µo/r	<1	<1	32	9070	<1
Naphthalene	81@0@	T	µo/r	<T	<T	<T	4530	6
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	95.5	110	95.4	101	96.6
Toluene-D8	F0Yj @l @	0Bl	%	90.7	110	101	106	94.9
4-Bromofluorobenzene	4l 0@0@	0Bl	%	81.2	101	96.8	99.6	83.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	30.1	24.1	24.2	49.0	37.2
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	60.5	48.6	52.3	92.4	74.6
2.4.6-Tribromophenol	11a@8@	0Bl	%	75.6	81.2	116	116	86.5
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	66.6	62.0	68.3	105	79.6
Anthracene-d10	1j 18@l @	0Bl	%	77.2	83.5	93.1	121	89.8
4-Terphenyl-d14	1j 1a@1@	0Bl	%	88.1	92.2	107	127	101
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	113	130	97.7	118	112
Toluene-D8	F0Yj @l @	0Bl	%	95.7	116	98.0	111	100
4-Bromofluorobenzene	4l 0@0@	0Bl	%	83.4	101	91.6	99.6	83.3

Analytical Results

hRt @le9x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: GW27	GW36	GW39	GW40	GW41
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-016	EM1104286-017	EM1104286-018	EM1104286-019	EM1104286-020
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	7.30	7.08	6.52	7.10	7.15
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn@10@10	T	u o/r	3610	3400	3110	1040	1260
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX@10@01	1	u o/r	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	506	800	215	167	224
Total Alkalinity as CaCO3	@@@@	1	u o/r	506	800	215	167	224
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	711	440	2250	28	226
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	1100	1320	57	385	298
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	73	93	280	128	147
Magnesium	j 4Y8@T@	1	u o/r	75	113	81	42	66
Sodium	j 440@Y@	1	u o/r	941	931	68	55	48
Potassium	j 440@8@	1	u o/r	10	35	17	27	24
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
Arsenic	j 440@a@	0B001	u o/r	0.003	0.025	0.011	0.007	0.014
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	<0B0001	<0B0001	<0B0001	<0B0001
Cobalt	j 440@a@	0B001	u o/r	0.003	0.002	0.040	<0B001	0.001
Copper	j 440@0@	0B001	u o/r	0.004	0.004	0.001	0.001	0.001
Lead	j 4Y8@F@	0B001	u o/r	<0B001	<0B001	<0B001	<0B001	0.001
Manganese	j 4Y8@l @	0B001	u o/r	0.231	0.241	5.50	0.124	0.132
Nickel	j 440@F@	0B001	u o/r	0.023	0.005	0.029	0.005	<0B001
Selenium	j j aF@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
Zinc	j 440@l @	0B00T	u o/r	0.019	0.009	0.012	<0B00T	<0B00T
Boron	j 440@F@	0B0T	u o/r	0.65	1.30	1.57	0.34	0.67
Iron	j 4Y8@8@	0B0T	u o/r	<0B0T	<0B0T	29.5	<0B0T	<0B0T
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	0.0004	0.0002	<0B0001	0.0002	0.0002
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	<0B01	<0B01	<0B01	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	<0B004	<0B004	0.006	<0B004	<0B004
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

hRt @le@x: WATER			Client sample ID	GW27	GW36	GW39	GW40	GW41
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	*CAS Number*	*LOR*	*Unit*	EM1104286-016	EM1104286-017	EM1104286-018	EM1104286-019	EM1104286-020
EK026G: Total Cyanide By Discrete Analyser - Continued								
Total Cyanide	Tj @F@	0B004	u o/r	0.004	0.053	0.093	0.010	0.027
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	@@@@	0B004	u o/r	<0B004	<0B004	0.009	<0B004	<0B004
EK040P: Fluoride by PC Titrator								
Fluoride	1l 8a4@a@	0B1	u o/r	1.0	1.9	1.0	1.0	1.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	j l l 4@1@	0B01	u o/r	0.60	3.76	430	8.90	0.31
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	@@@@	0B01	u o/r	0.03	0.08	0.55	0.01	<0B01
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14j 8j @T@	0B01	u o/r	10.2	2.77	0.66	0.28	0.09
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	@@@@	0B01	u o/r	10.3	2.84	1.21	0.30	0.09
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	@@@@	0B01	u o/r	0.04	<0B01	<0B01	<0B01	<0B01
EK085M: Sulfide as S2-								
Sulfide as S2-	1a48l @T@	0B1	u o/r	<0B1	<0B1	<0B1	<0B1	<0B1
EN055: Ionic Balance								
^ Total Anions	@@@@	0B01	u : q/r	56.0	62.2	52.8	14.8	17.6
^ Total Cations	@@@@	0B01	u : q/r	51.0	55.3	@@@@	12.9	15.5
Total Cations	@@@@	0B01	u : q/r	@@@@	@@@@	48.0	@@@@	@@@@
^ Ionic Balance	@@@@	0B01	%	4.65	5.94	@@@@	6.60	6.30
Ionic Balance	@@@@	0B01	%	@@@@	@@@@	4.68	@@@@	@@@@
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100@F@	T	µo/r	<T	<T	<T	<T	<T
Isopropylbenzene	8a@F@	T	µo/r	<T	<T	<T	<T	<T
n-Propylbenzene	10Y@T@	T	µo/r	<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r	<T	<T	<T	<T	<T
sec-Butylbenzene	1YT@a@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r	<T	<T	<T	<T	<T
tert-Butylbenzene	8a@l @	T	µo/r	<T	<T	<T	<T	<T
p-Isopropyltoluene	88@j @	T	µo/r	<T	<T	<T	<T	<T
n-Butylbenzene	104@1@	T	µo/r	<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds								
Vinyl Acetate	10a@T@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW27	GW36	GW39	GW40	GW41
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-016	EM1104286-017	EM1104286-018	EM1104286-019	EM1104286-020
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<T	<T	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<T	<T	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<T	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<T	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<T	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<T	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<T	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<T	<T	<T

Analytical Results

hRt @le@x: WATER			Client sample ID	GW27	GW36	GW39	GW40	GW41
			Client sampling date / time	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00
Compound	*CAS Number*	*LOR*	*Unit*	EM1104286-016	EM1104286-017	EM1104286-018	EM1104286-019	EM1104286-020
EP074E: Halogenated Aliphatic Compounds - Continued								
Hexachlorobutadiene	aj @a@	T	µo/r	<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<T	<T	<T	<T	<T
Bromobenzene	10a@l @	T	µo/r	<T	<T	<T	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r	<T	<T	<T	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r	<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r	<T	<T	<T	<T	<T
EP074G: Trihalomethanes								
Chloroform	l j @ @	T	µo/r	<T	<T	<T	<T	<T
Bromodichloromethane	j T@j @	T	µo/r	<T	<T	<T	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r	<T	<T	<T	<T	<T
Bromoform	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	81@0@	1B0	µo/r	<1B0	<1B0	**22.3**	<1B0	<1B0
Acenaphthylene	F0a@l @	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Acenaphthene	aY@F@	1B0	µo/r	<1B0	<1B0	**4.1**	<1B0	<1B0
Fluorene	al @Y@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Phenanthrene	aT@1@	1B0	µo/r	<1B0	<1B0	<1B0	**1.6**	**4.5**
Anthracene	1F0@F@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	**1.5**
Fluoranthene	F0l @4@	1B0	µo/r	<1B0	<1B0	<1B0	**2.8**	**8.3**
Pyrene	1F8@0@	1B0	µo/r	<1B0	<1B0	<1B0	**2.6**	**8.5**
Benz(a)anthracene	Tl @T@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	**4.1**
Chrysene	F1a@1@	1B0	µo/r	<1B0	<1B0	<1B0	**1.2**	**3.5**
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r	<1B0	<1B0	<1B0	**1.2**	**4.9**
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	**1.3**
Benzo(a)pyrene	T0@F@	0BT	µo/r	<0B	<0B	<0B	**0.9**	**3.6**
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	**2.2**
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	**2.1**
^ Sum of polycyclic aromatic hydrocarbons	@@@@	0BT	µo/r	<1Bl	<1Bl	**26.4**	**10.3**	**44.5**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	@@@@	F0	µo/r	<F0	<F0	**60**	<F0	<F0
C10 - C14 Fraction	@@@@	T0	µo/r	<T0	<T0	**440**	<T0	<T0

Analytical Results

hRt @le@x: WATER			Client sample ID	GW27	GW36	GW39	GW40	GW41
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit	EM1104286-016	EM1104286-017	EM1104286-018	EM1104286-019	EM1104286-020
EP080/071: Total Petroleum Hydrocarbons - Continued								
C15 - C28 Fraction	@@@	100	µo/r	280	<100	1590	<100	150
C29 - C36 Fraction	@@@	T0	µo/r	190	<T0	140	70	110
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	470	<T0	2170	70	260
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@	F0	µo/r	<F0	<F0	70	<F0	<F0
^ C6 - C10 Fraction minus BTEX (F1)	@@@	F0	µo/r	<F0	<F0	30	<F0	<F0
>C10 - C16 Fraction	@@@	100	µo/r	<100	<100	690	<100	<100
>C16 - C34 Fraction	@@@	100	µo/r	380	<100	1390	120	220
>C34 - C40 Fraction	@@@	100	µo/r	100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	@@@	100	µo/r	480	<100	2080	120	220
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	<1	<1	28	<1	<1
Toluene	10a@a@	F	µo/r	<F	<F	4	<F	<F
Ethylbenzene	100@1@	F	µo/r	<F	<F	2	<F	<F
meta- & para-Xylene	10a@a@3l0l @F@	F	µo/r	<F	<F	4	<F	<F
ortho-Xylene	8T@j @	F	µo/r	<F	<F	4	<F	<F
^ Total Xylenes	1YY0@0@	F	µo/r	<F	<F	8	<F	<F
^ Sum of BTEX	@@@	1	µo/r	<1	<1	42	<1	<1
Naphthalene	81@0@	T	µo/r	<T	<T	18	<T	<T
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	82.9	87.0	79.3	98.6	89.7
Toluene-D8	F0Yj @l @	0Bl	%	79.7	92.0	85.1	99.0	89.1
4-Bromofluorobenzene	4l 0@0@	0Bl	%	71.4	84.8	79.3	87.9	79.8
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	15.7	33.2	11.6	34.1	29.5
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	42.6	72.7	49.3	70.5	58.7
2.4.6-Tribromophenol	11a@8@	0Bl	%	27.4	90.0	94.6	86.8	83.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	57.3	88.7	77.3	81.1	75.5
Anthracene-d10	1j 18@l @	0Bl	%	67.4	98.5	86.9	87.6	85.1
4-Terphenyl-d14	1j 1a@1@	0Bl	%	79.4	109	106	100	102
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	97.5	88.5	80.5	114	105
Toluene-D8	F0Yj @l @	0Bl	%	84.1	89.3	82.0	105	94.3
4-Bromofluorobenzene	4l 0@0@	0Bl	%	70.2	81.2	74.6	87.6	81.2

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW42D Client sampling date / time: F1@ V@0113 Tf00 EM1104286-021	Client sample ID: GW43D Client sampling date / time: F0@ V@0113 Tf00 EM1104286-022	Client sample ID: GW44D Client sampling date / time: F0@ V@0113 Tf00 EM1104286-023	Client sample ID: DUP1 Client sampling date / time: F0@ V@0113 Tf00 EM1104286-024	Client sample ID: SPLIT1 Client sampling date / time: F0@ V@0113 Tf00 EM1104286-025
EA005: pH								
pH Value	@@@@	0E01	- H37 mC	6.30	6.75	6.72	6.49	6.40
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	23400	19400	8860	3270	3100
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX @10@01	1	u o/r	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	143	410	881	184	186
Total Alkalinity as CaCO3	@@@@	1	u o/r	143	410	881	184	186
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	14800	1090	5020	2140	1950
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	3380	9860	450	66	64
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	375	427	399	246	243
Magnesium	j 4Y8@T@	1	u o/r	787	694	169	46	45
Sodium	j 440@Y@	1	u o/r	2450	5140	594	70	68
Potassium	j 440@8@	1	u o/r	217	212	48	16	15
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0E01	u o/r	3.91	<0E01	<0E01	<0E01	<0E01
Arsenic	j 440@a@	0E001	u o/r	0.031	0.002	0.038	0.012	0.010
Cadmium	j 440@Y@	0E0001	u o/r	0.0012	0.0025	<0E0001	<0E0001	<0E0001
Cobalt	j 440@a@	0E001	u o/r	9.66	0.075	0.051	0.024	0.024
Copper	j 440@0@	0E001	u o/r	0.051	0.007	0.009	0.001	0.001
Lead	j 4Y8@F@	0E001	u o/r	0.002	<0E001	<0E001	<0E001	<0E001
Manganese	j 4Y8@l @	0E001	u o/r	120	7.63	10.5	4.03	3.88
Nickel	j 440@F@	0E001	u o/r	2.82	0.067	0.072	0.020	0.007
Selenium	j j aF@8@	0E01	u o/r	0.03	<0E01	0.01	<0E01	<0E01
Zinc	j 440@l @	0E00T	u o/r	2.20	0.016	0.032	0.071	0.013
Boron	j 440@F@	0E0T	u o/r	0.66	1.14	1.02	1.37	1.39
Iron	j 4Y8@8@	0E0T	u o/r	12.9	0.40	11.1	21.7	20.6
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0E0001	u o/r	0.0002	<0E0001	<0E0001	<0E0001	<0E0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0E01	u o/r	<0E01	<0E01	<0E01	<0E01	<0E01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0E004	u o/r	0.013	<0E004	0.186	0.007	0.014
EK026G: Total Cyanide By Discrete Analyser								

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW42D Client sampling date / time: F1@ V@0113lTf00 EM1104286-021	Client sample ID: GW43D Client sampling date / time: F0@ V@0113lTf00 EM1104286-022	Client sample ID: GW44D Client sampling date / time: F0@ V@0113lTf00 EM1104286-023	Client sample ID: DUP1 Client sampling date / time: F0@ V@0113lTf00 EM1104286-024	Client sample ID: SPLIT1 Client sampling date / time: F0@ V@0113lTf00 EM1104286-025
EK026G: Total Cyanide By Discrete Analyser - Continued								
Total Cyanide	Tj @F@	0B04	u o/r	0.434	<0B04	3.98	0.070	0.072
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	@@@@	0B04	u o/r	0.044	<0B04	0.865	0.016	0.014
EK040P: Fluoride by PC Titrator								
Fluoride	1l 8a4@a@	0B1	u o/r	1.0	0.3	0.6	1.1	1.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	j l l 4@1@	0B01	u o/r	2170	4.11	1190	452	460
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	@@@@	0B01	u o/r	0.02	<0B01	0.03	<0B01	<0B01
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14j 8j @T@	0B01	u o/r	<0B01	0.01	0.03	<0B01	<0B01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	@@@@	0B01	u o/r	0.03	0.01	0.06	<0B01	<0B01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	@@@@	0B01	u o/r	<0B01	0.03	<0B01	<0B01	<0B01
EK085M: Sulfide as S2-								
Sulfide as S2-	1a48l @T@	0B1	u o/r	<0B1	<0B1	<0B1	<0B1	<0B1
EN055: Ionic Balance								
^ Total Anions	@@@@	0B01	u : q/r	407	309	135	50.1	46.0
^ Total Cations	@@@@	0B01	u : q/r	@@@@	308	@@@@	@@@@	@@@@
Total Cations	@@@@	0B01	u : q/r	316	@@@@	127	42.2	44.7
^ Ionic Balance	@@@@	0B01	%	@@@@	0.25	@@@@	@@@@	@@@@
Ionic Balance	@@@@	0B01	%	12.5	@@@@	3.09	8.55	1.53
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100@F@	T	µo/r	<T	<T	<10	<T	<T
Isopropylbenzene	8a@F@	T	µo/r	<T	<T	<10	<T	<T
n-Propylbenzene	10Y@T@	T	µo/r	<T	<T	<10	<T	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r	<T	<T	18	<T	<T
sec-Butylbenzene	1YT@a@	T	µo/r	<T	<T	<10	<T	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r	<T	<T	49	<T	<T
tert-Butylbenzene	8a@l @	T	µo/r	<T	<T	<10	<T	<T
p-Isopropyltoluene	88@j @	T	µo/r	<T	<T	<10	<T	<T
n-Butylbenzene	104@1@	T	µo/r	<T	<T	<10	<T	<T
EP074B: Oxygenated Compounds								
Vinyl Acetate	10a@T@	T0	µo/r	<T0	<T0	<100	<T0	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r	<T0	<T0	520	<T0	<T0

Analytical Results

hRt @le@x: **WATER**

			Client sample ID	GW42D	GW43D	GW44D	DUP1	SPLIT1
			Client sampling date / time	F1@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F0@ V@0113 Tf00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104286-021**	**EM1104286-022**	**EM1104286-023**	**EM1104286-024**	**EM1104286-025**
EP074B: Oxygenated Compounds - Continued								
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r	<T0	<T0	<100	<T0	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r	<T0	<T0	<100	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<10	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<10	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<10	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<10	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<10	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<10	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<100	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<100	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<100	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<100	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<100	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<100	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<10	<T	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<10	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<10	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<10	<T	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<10	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<10	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<10	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<10	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<10	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<10	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<10	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<10	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<10	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<10	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<10	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<10	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<10	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<10	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<10	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<10	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<10	<T	<T

Analytical Results

hRt @le@x: WATER				Client sample ID	GW42D	GW43D	GW44D	DUP1	SPLIT1
				Client sampling date / time	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit		EM1104286-021	EM1104286-022	EM1104286-023	EM1104286-024	EM1104286-025
EP074E: Halogenated Aliphatic Compounds - Continued									
Hexachlorobutadiene	aj @a@	T	µo/r		<T	<T	<10	<T	<T
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	10a@0@	T	µo/r		8	<T	<10	<T	<T
Bromobenzene	10a@l @	T	µo/r		<T	<T	<10	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r		<T	<T	<10	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r		<T	<T	<10	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r		<T	<T	<10	<T	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r		<T	<T	<10	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r		<T	<T	<10	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r		<T	<T	<10	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r		<T	<T	<10	<T	<T
EP074G: Trihalomethanes									
Chloroform	l j @l @	T	µo/r		<T	<T	<10	<T	<T
Bromodichloromethane	j T@j @	T	µo/r		<T	<T	<10	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r		<T	<T	<10	<T	<T
Bromoform	j T@T@	T	µo/r		<T	<T	<10	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	81@0@	1B0	µo/r		21.3	<1B0	142	1.4	1.6
Acenaphthylene	F0a@l @	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Acenaphthene	aY@F@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Fluorene	al @Y@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Phenanthrene	aT@1@	1B0	µo/r		<1B0	2.0	<100	<1B0	<1B0
Anthracene	1F0@F@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r		<1B0	2.1	<100	<1B0	<1B0
Pyrene	1F8@0@	1B0	µo/r		<1B0	1.7	<100	<1B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Chrysene	F1a@1@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r		<0BT	<0BT	<TYBa	<0B	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r		<1B0	<1B0	<100	<1B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@@	0BT	µo/r		21.3	5.8	142	1.4	1.6
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	@@@@	F0	µo/r		470	<F0	3380	30	40
C10 - C14 Fraction	@@@@	T0	µo/r		2960	<T0	251000	480	530

Analytical Results

hRt @le@x: WATER			Client sample ID	GW42D	GW43D	GW44D	DUP1	SPLIT1
			Client sampling date / time	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit	EM1104286-021	EM1104286-022	EM1104286-023	EM1104286-024	EM1104286-025
EP080/071: Total Petroleum Hydrocarbons - Continued								
C15 - C28 Fraction	@@@	100	µo/r	1560	180	32200	1410	1480
C29 - C36 Fraction	@@@	T0	µo/r	200	210	1770	230	180
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	4720	390	285000	2120	2190
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@	F0	µo/r	480	20	3540	50	50
^ C6 - C10 Fraction minus BTEX (F1)	@@@	F0	µo/r	40	<F0	1000	30	30
>C10 - C16 Fraction	@@@	100	µo/r	1750	<100	230000	710	790
>C16 - C34 Fraction	@@@	100	µo/r	1410	330	25000	1320	1340
>C34 - C40 Fraction	@@@	100	µo/r	110	150	710	190	130
^ >C10 - C40 Fraction (sum)	@@@	100	µo/r	3270	480	256000	2220	2260
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	355	<1	1350	3	3
Toluene	10a@a@	F	µo/r	61	12	712	3	3
Ethylbenzene	100@1@	F	µo/r	3	<F	46	3	3
meta- & para-Xylene	10a@a@3l0l @F@	F	µo/r	11	<F	285	6	6
ortho-Xylene	8T@j @	F	µo/r	9	<F	150	4	4
^ Total Xylenes	1YY0@0@	F	µo/r	20	<F	435	10	10
^ Sum of BTEX	@@@	1	µo/r	439	12	2540	19	19
Naphthalene	81@0@	T	µo/r	33	<T	776	19	8
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	105	98.0	97.0	96.7	100
Toluene-D8	F0Yj @l @	0Bl	%	106	97.9	102	101	100
4-Bromofluorobenzene	4l 0@0@	0Bl	%	105	99.8	99.9	102	101
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	17.3	19.4	Not Determined	33.6	31.4
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	78.2	40.8	Not Determined	108	89.6
2.4.6-Tribromophenol	11a@8@	0Bl	%	92.0	120	Not Determined	108	121
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	117	95.0	Not Determined	90.7	106
Anthracene-d10	1j 18@l @	0Bl	%	94.2	95.4	Not Determined	101	95.8
4-Terphenyl-d14	1j 1a@1@	0Bl	%	97.9	105	Not Determined	86.9	83.9
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	106	98.4	99.2	97.8	100
Toluene-D8	F0Yj @l @	0Bl	%	105	98.9	103	101	100
4-Bromofluorobenzene	4l 0@0@	0Bl	%	108	102	104	106	103

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: DUP3	SPLIT3	SPLIT4	RINSATE-2	RINSATE-3
				Client sampling date / time: F0@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-026	EM1104286-027	EM1104286-028	EM1104286-029	EM1104286-030
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	7.34	7.31	6.29	@@@@	@@@@
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	4170	4340	@@@@	@@@@	@@@@
Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	@@@@	@@@@	21500	@@@@	@@@@
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX @10@01	1	u o/r	<1	<1	<1	@@@@	@@@@
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	<1	<1	<1	@@@@	@@@@
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	682	684	140	@@@@	@@@@
Total Alkalinity as CaCO3	@@@@	1	u o/r	682	684	140	@@@@	@@@@
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	2710	2470	15000	@@@@	@@@@
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	43	46	2920	@@@@	@@@@
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	50	47	386	@@@@	@@@@
Magnesium	j 4Y8@T@	1	u o/r	36	35	785	@@@@	@@@@
Sodium	j 440@Y@	1	u o/r	57	55	2450	@@@@	@@@@
Potassium	j 440@8@	1	u o/r	16	16	216	@@@@	@@@@
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	<0B01	<0B01	3.02	@@@@	@@@@
Arsenic	j 440@a@	0B001	u o/r	0.041	0.043	0.025	@@@@	@@@@
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	<0B0001	0.0013	@@@@	@@@@
Cobalt	j 440@a@	0B001	u o/r	0.002	0.002	9.37	@@@@	@@@@
Copper	j 440@0@	0B001	u o/r	0.004	0.003	0.045	@@@@	@@@@
Lead	j 4Y8@F@	0B001	u o/r	0.001	0.002	<0B001	@@@@	@@@@
Manganese	j 4Y8@l @	0B001	u o/r	0.021	0.020	118	@@@@	@@@@
Nickel	j 440@F@	0B001	u o/r	0.013	0.015	2.81	@@@@	@@@@
Selenium	j j aF@8@	0B01	u o/r	<0B01	<0B01	0.03	@@@@	@@@@
Zinc	j 440@l @	0B00T	u o/r	0.012	0.013	2.15	@@@@	@@@@
Boron	j 440@F@	0B0T	u o/r	0.33	0.34	0.67	@@@@	@@@@
Iron	j 4Y8@8@	0B0T	u o/r	0.10	0.11	12.4	@@@@	@@@@
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	<0B0001	<0B0001	<0B0001	@@@@	@@@@
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	<0B01	<0B01	@@@@	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	0.010	0.011	0.021	@@@@	<0B004

Analytical Results

hRt @le@x: WATER	Client sample ID	DUP3	SPLIT3	SPLIT4	RINSATE-2	RINSATE-3
	Client sampling date / time	F0@ V@0113 Tf00	F0@ V@0113 Tf00	F1@ V@0113 Tf00	18@ V@0113 Tf00	F0@ V@0113 Tf00
Compound / CAS Number / LOR / Unit		EM1104286-026	EM1104286-027	EM1104286-028	EM1104286-029	EM1104286-030
EK026G: Total Cyanide By Discrete Analyser						
Total Cyanide — Tj @F@ — 0B04 — u o/r		0.253	0.211	0.456	@@@@	<0B04
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser						
Weak Acid Dissociable Cyanide — @@@@ — 0B04 — u o/r		0.021	0.024	0.037	@@@@	<0B04
EK040P: Fluoride by PC Titrator						
Fluoride — 1l 8a4@a@ — 0B — u o/r		0.3	0.3	1.0	@@@@	@@@@
EK055G: Ammonia as N by Discrete Analyser						
Ammonia as N — j l l 4@1@ — 0B01 — u o/r		1000	1020	2170	@@@@	<0B01
EK057G: Nitrite as N by Discrete Analyser						
Nitrite as N — @@@@ — 0B01 — u o/r		0.04	0.02	0.02	@@@@	@@@@
EK058G: Nitrate as N by Discrete Analyser						
^ Nitrate as N — 14j 8j @T@ — 0B01 — u o/r		3.94	3.71	0.01	@@@@	@@@@
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser						
Nitrite + Nitrate as N — @@@@ — 0B01 — u o/r		3.98	3.74	0.04	@@@@	@@@@
EK071G: Reactive Phosphorus as P by discrete analyser						
Reactive Phosphorus as P — @@@@ — 0B01 — u o/r		<0B01	<0B01	<0B01	@@@@	@@@@
EK085M: Sulfide as S2-						
Sulfide as S2- — 1a48l @T@ — 0B — u o/r		<0B	<0B	<0B	@@@@	<0B
EN055: Ionic Balance						
^ Total Anions — @@@@ — 0B01 — u : q/r		71.3	66.4	398	@@@@	@@@@
Total Cations — @@@@ — 0B01 — u : q/r		64.2	64.8	316	@@@@	@@@@
Ionic Balance — @@@@ — 0B01 — %		5.25	1.18	11.3	@@@@	@@@@
EP074A: Monocyclic Aromatic Hydrocarbons						
Styrene — 100@F@ — T — µo/r		196	205	<T	<T	<T
Isopropylbenzene — 8a@F@ — T — µo/r		<100	<100	<T	<T	<T
n-Propylbenzene — 10Y@T@ — T — µo/r		<100	<100	<T	<T	<T
1.3.5-Trimethylbenzene — 10a@j @ — T — µo/r		102	<100	<T	<T	<T
sec-Butylbenzene — 1YT@a@ — T — µo/r		<100	<100	<T	<T	<T
1.2.4-Trimethylbenzene — 8T@Y@ — T — µo/r		205	220	<T	<T	<T
tert-Butylbenzene — 8a@l @ — T — µo/r		<100	<100	<T	<T	<T
p-Isopropyltoluene — 88@j @ — T — µo/r		<100	<100	<T	<T	<T
n-Butylbenzene — 104@1@ — T — µo/r		<100	<100	<T	<T	<T
EP074B: Oxygenated Compounds						
Vinyl Acetate — 10a@T@ — T0 — µo/r		<1000	<1000	<T0	<T0	<T0
2-Butanone (MEK) — j a@Y@ — T0 — µo/r		<1000	<1000	<T0	<T0	<T0
4-Methyl-2-pentanone (MIBK) — 10a@0@ — T0 — µo/r		<1000	<1000	<T0	<T0	<T0
2-Hexanone (MBK) — T81@a@ — T0 — µo/r		<1000	<1000	<T0	<T0	<T0

Analytical Results

hRt @le@x: WATER			Client sample ID	DUP3	SPLIT3	SPLIT4	RINSATE-2	RINSATE-3
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00
Compound	*CAS Number*	*LOR*	*Unit*	EM1104286-026	EM1104286-027	EM1104286-028	EM1104286-029	EM1104286-030
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<100	<100	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<100	<100	<T	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<100	<100	<T	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<100	<100	<T	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<100	<100	<T	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<100	<100	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<1000	<1000	<T0	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<1000	<1000	<T0	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<1000	<1000	<T0	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<1000	<1000	<T0	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<1000	<1000	<T0	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<1000	<1000	<T0	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<100	<100	<T	<T	<T
Iodomethane	j 4@a@	T	µo/r	<100	<100	<T	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<100	<100	<T	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<100	<100	<T	<T	<T
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<100	<100	<T	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<100	<100	<T	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<100	<100	<T	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<100	<100	<T	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<100	<100	<T	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<100	<100	<T	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<100	<100	<T	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<100	<100	<T	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<100	<100	<T	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<100	<100	<T	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<100	<100	<T	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<100	<100	<T	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<100	<100	<T	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<100	<100	<T	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<100	<100	<T	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<100	<100	<T	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<100	<100	<T	<T	<T
Hexachlorobutadiene	aj @a@	T	µo/r	<100	<100	<T	<T	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<100	<100	8	<T	<T

Analytical Results

hRt @le@x: WATER				Client sample ID	DUP3	SPLIT3	SPLIT4	RINSATE-2	RINSATE-3
				Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit		EM1104286-026	EM1104286-027	EM1104286-028	EM1104286-029	EM1104286-030
EP074F: Halogenated Aromatic Compounds - Continued									
Bromobenzene	10a@l @	T	µo/r		<100	<100	<T	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r		<100	<100	<T	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r		<100	<100	<T	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r		<100	<100	<T	<T	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r		<100	<100	<T	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r		<100	<100	<T	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r		<100	<100	<T	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r		<100	<100	<T	<T	<T
EP074G: Trihalomethanes									
Chloroform	l j @l @	T	µo/r		<100	<100	<T	<T	<T
Bromodichloromethane	j T@j @	T	µo/r		<100	<100	<T	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r		<100	<100	<T	<T	<T
Bromoform	j T@T@	T	µo/r		<100	<100	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	81@0@	1B0	µo/r		**2980**	**2710**	**27.3**	<1B0	<1B0
Acenaphthylene	F0a@l @	1B0	µo/r		**23.9**	**31.5**	<1B0	<1B0	<1B0
Acenaphthene	aY@F@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Fluorene	al @Y@	1B0	µo/r		**15.4**	**14.6**	<1B0	<1B0	<1B0
Phenanthrene	aT@1@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Anthracene	1F0@F@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Pyrene	1F8@0@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Chrysene	F1a@1@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r		<TB	<TBT	<0B	<0BT	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r		<10B0	<10B0	<1B0	<1B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@	0BT	µo/r		**3020**	**2760**	**27.3**	<0BT	<1B
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	@@@	F0	µo/r		**9990**	**10200**	**460**	<F0	<F0
C10 - C14 Fraction	@@@	T0	µo/r		**14200**	**12400**	**3070**	<T0	<T0
C15 - C28 Fraction	@@@	100	µo/r		**5510**	**4760**	**1880**	<100	<100
C29 - C36 Fraction	@@@	T0	µo/r		**150**	**140**	**280**	<T0	<T0
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r		**19900**	**17300**	**5230**	<T0	<T0

Analytical Results

hRt @le@x: WATER			Client sample ID	DUP3	SPLIT3	SPLIT4	RINSATE-2	RINSATE-3
			Client sampling date / time	F0@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	18@ V@0113lTf00	F0@ V@0113lTf00
Compound	CAS Number	LOR	Unit	EM1104286-026	EM1104286-027	EM1104286-028	EM1104286-029	EM1104286-030
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@@	F0	µo/r	9930	10100	470	<F0	<F0
^ C6 - C10 Fraction minus BTEX (F1)	@@@@	F0	µo/r	<F000	2080	20	<F0	<F0
>C10 - C16 Fraction	@@@@	100	µo/r	14200	12200	1840	<100	<100
>C16 - C34 Fraction	@@@@	100	µo/r	4320	3740	1760	<100	<100
>C34 - C40 Fraction	@@@@	100	µo/r	<100	<100	180	<100	<100
^ >C10 - C40 Fraction (sum)	@@@@	100	µo/r	18500	15900	3780	<100	<100
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	5340	5250	364	<1	<1
Toluene	10a@a@	F	µo/r	282	287	62	<F	<F
Ethylbenzene	100@1@	F	µo/r	116	119	3	<F	<F
meta- & para-Xylene	10a@a@3l0l @F@	F	µo/r	1560	1600	10	<F	<F
ortho-Xylene	8T@j @	F	µo/r	728	766	9	<F	<F
^ Total Xylenes	1YY0@0@	F	µo/r	2290	2370	19	<F	<F
^ Sum of BTEX	@@@@	1	µo/r	8030	8020	448	<1	<1
Naphthalene	81@0@	T	µo/r	4020	5180	36	<T	<T
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	94.7	95.8	99.2	89.3	93.5
Toluene-D8	F0Yj @l @	0Bl	%	92.9	97.6	96.9	90.6	91.6
4-Bromofluorobenzene	4l 0@0@	0Bl	%	93.3	97.0	96.9	90.5	91.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	40.0	40.0	19.5	42.6	22.5
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	106	106	77.6	101	50.8
2.4.6-Tribromophenol	11a@8@	0Bl	%	129	109	117	66.9	64.8
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	88.0	88.0	102	105	62.8
Anthracene-d10	1j 18@l @	0Bl	%	125	124	92.7	111	66.3
4-Terphenyl-d14	1j 1a@1@	0Bl	%	95.5	100	103	114	61.6
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	100	102	98.8	94.9	99.1
Toluene-D8	F0Yj @l @	0Bl	%	89.5	91.5	97.7	86.0	87.4
4-Bromofluorobenzene	4l 0@0@	0Bl	%	93.4	94.0	99.2	87.1	89.0

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: RINSATE-4	TRIP3	TRIP4	GW19	DUP4
				Client sampling date / time: F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-031	EM1104286-032	EM1104286-033	EM1104286-034	EM1104286-035
EA005: pH								
pH Value	@@@@	0B01	- H37 mC	@@@@	@@@@	@@@@	5.43	6.22
EA015: Total Dissolved Solids								
^ Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	@@@@	@@@@	@@@@	2320	@@@@
Total Dissolved Solids @180°C	GSn @10@10	T	u o/r	@@@@	@@@@	@@@@	@@@@	22600
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	c MX @10@01	1	u o/r	@@@@	@@@@	@@@@	<1	<1
Carbonate Alkalinity as CaCO3	Ya1F@F@	1	u o/r	@@@@	@@@@	@@@@	<1	<1
Bicarbonate Alkalinity as CaCO3	j 1@F@	1	u o/r	@@@@	@@@@	@@@@	68	136
Total Alkalinity as CaCO3	@@@@	1	u o/r	@@@@	@@@@	@@@@	68	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14a0a@8@	1	u o/r	@@@@	@@@@	@@@@	700	14800
ED045G: Chloride Discrete analyser								
Chloride	1l aaj @0@	1	u o/r	@@@@	@@@@	@@@@	56	2620
ED093F: Dissolved Major Cations								
Calcium	j 440@0@	1	u o/r	@@@@	@@@@	@@@@	198	396
Magnesium	j 4Y8@T@	1	u o/r	@@@@	@@@@	@@@@	69	812
Sodium	j 440@Y@	1	u o/r	@@@@	@@@@	@@@@	51	2580
Potassium	j 440@8@	1	u o/r	@@@@	@@@@	@@@@	43	224
EG020F: Dissolved Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	@@@@	@@@@	@@@@	0.17	3.15
Arsenic	j 440@a@	0B001	u o/r	@@@@	@@@@	@@@@	0.799	0.025
Cadmium	j 440@Y@	0B0001	u o/r	@@@@	@@@@	@@@@	<0B001	0.0013
Cobalt	j 440@a@	0B001	u o/r	@@@@	@@@@	@@@@	0.079	9.63
Copper	j 440@0@	0B001	u o/r	@@@@	@@@@	@@@@	0.001	0.048
Lead	j 4Y8@F@	0B001	u o/r	@@@@	@@@@	@@@@	<0B001	0.001
Manganese	j 4Y8@l @	0B001	u o/r	@@@@	@@@@	@@@@	14.2	121
Nickel	j 440@F@	0B001	u o/r	@@@@	@@@@	@@@@	0.021	2.84
Selenium	j j aF@8@	0B01	u o/r	@@@@	@@@@	@@@@	<0B01	0.03
Zinc	j 440@l @	0B00T	u o/r	@@@@	@@@@	@@@@	0.129	2.16
Boron	j 440@F@	0B0T	u o/r	@@@@	@@@@	@@@@	1.86	0.66
Iron	j 4Y8@8@	0B0T	u o/r	@@@@	@@@@	@@@@	309	12.8
EG020T: Total Metals by ICP-MS								
Aluminium	j 4F8@0@	0B01	u o/r	<0B01	@@@@	@@@@	@@@@	@@@@
Arsenic	j 440@a@	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@
Cadmium	j 440@Y@	0B0001	u o/r	<0B0001	@@@@	@@@@	@@@@	@@@@
Cobalt	j 440@a@	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@
Copper	j 440@0@	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: RINSATE-4	TRIP3	TRIP4	GW19	DUP4
Client sampling date / time				F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-031	EM1104286-032	EM1104286-033	EM1104286-034	EM1104286-035
EG020T: Total Metals by ICP-MS - Continued								
Lead	j 4Y8@F@	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@
Manganese	j 4Y8@l @	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@
Nickel	j 440@F@	0B001	u o/r	<0B001	@@@@	@@@@	@@@@	@@@@
Selenium	j j aF@8@	0B01	u o/r	<0B01	@@@@	@@@@	@@@@	@@@@
Zinc	j 440@l @	0B00T	u o/r	<0B00T	@@@@	@@@@	@@@@	@@@@
Boron	j 440@F@	0B0T	u o/r	<0B0T	@@@@	@@@@	@@@@	@@@@
Iron	j 4Y8@8@	0B0T	u o/r	<0B0T	@@@@	@@@@	@@@@	@@@@
EG035F: Dissolved Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	@@@@	@@@@	@@@@	<0B0001	<0B0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	j 4Y8@j @	0B0001	u o/r	<0B0001	@@@@	@@@@	@@@@	@@@@
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	1aT40@8@	0B01	u o/r	<0B01	@@@@	@@@@	<0B01	<0B01
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	@@@@	0B004	u o/r	<0B004	@@@@	@@@@	<0B004	**0.016**
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	Tj @F@	0B004	u o/r	<0B004	@@@@	@@@@	**0.080**	**0.509**
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	@@@@	0B004	u o/r	<0B004	@@@@	@@@@	<0B004	**0.046**
EK040P: Fluoride by PC Titrator								
Fluoride	1l 8a4@a@	0B1	u o/r	@@@@	@@@@	@@@@	**0.6**	**1.0**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	j l l 4@1@	0B01	u o/r	<0B01	@@@@	@@@@	**184**	**2110**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	@@@@	0B01	u o/r	@@@@	@@@@	@@@@	**0.01**	**0.05**
EK058G: Nitrate as N by Discrete Analyser								
^ Nitrate as N	14j 8j @T@	0B01	u o/r	@@@@	@@@@	@@@@	**0.15**	<0B01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	@@@@	0B01	u o/r	@@@@	@@@@	@@@@	**0.16**	**0.05**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	@@@@	0B01	u o/r	@@@@	@@@@	@@@@	<0B01	<0B01
EK085M: Sulfide as S2-								
Sulfide as S2-	1a48l @T@	0B1	u o/r	<0B1	@@@@	@@@@	<0B1	<0B1
EN055: Ionic Balance								
^ Total Anions	@@@@	0B01	u : q/r	@@@@	@@@@	@@@@	**17.5**	**386**
^ Total Cations	@@@@	0B01	u : q/r	@@@@	@@@@	@@@@	**18.9**	@@@@

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: RINSATE-4	TRIP3	TRIP4	GW19	DUP4
Client sampling date / time				F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-031	EM1104286-032	EM1104286-033	EM1104286-034	EM1104286-035
EN055: Ionic Balance - Continued								
Total Cations	@@@@	0B01	u : q/r	@@@@	@@@@	@@@@	@@@@	321
^ Ionic Balance	@@@@	0B01	%	@@@@	@@@@	@@@@	3.89	@@@@
Ionic Balance	@@@@	0B01	%	@@@@	@@@@	@@@@	@@@@	8.92
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100@F@	T	µo/r	<T	<T	<T	<T	<T
Isopropylbenzene	8a@F@	T	µo/r	<T	<T	<T	<T	<T
n-Propylbenzene	10Y@T@	T	µo/r	<T	<T	<T	<T	<T
1.3.5-Trimethylbenzene	10a@j @	T	µo/r	<T	<T	<T	<T	<T
sec-Butylbenzene	1YT@a@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trimethylbenzene	8T@Y@	T	µo/r	<T	<T	<T	<T	<T
tert-Butylbenzene	8a@l @	T	µo/r	<T	<T	<T	<T	<T
p-Isopropyltoluene	88@j @	T	µo/r	<T	<T	<T	<T	<T
n-Butylbenzene	104@1@	T	µo/r	<T	<T	<T	<T	<T
EP074B: Oxygenated Compounds								
Vinyl Acetate	10a@T@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Butanone (MEK)	j a@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
4-Methyl-2-pentanone (MIBK)	10a@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
2-Hexanone (MBK)	T81@a@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
EP074C: Sulfonated Compounds								
Carbon disulfide	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP074D: Fumigants								
2.2-Dichloropropane	T84@0@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloropropane	j a@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.3-Dichloropropylene	100l 1@1@	T	µo/r	<T	<T	<T	<T	<T
trans-1.3-Dichloropropylene	100l 1@F@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromoethane (EDB)	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloromethane	j 4@j @	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Vinyl chloride	j T@1@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Bromomethane	j 4@Y@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Chloroethane	j T@0@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
Trichlorofluoromethane	j T@8@	T0	µo/r	<T0	<T0	<T0	<T0	<T0
1.1-Dichloroethene	j T@T@	T	µo/r	<T	<T	<T	<T	<T
Iodomethane	j 4@a@	T	µo/r	<T	<T	<T	<T	<T
trans-1.2-Dichloroethene	1Tl @0@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloroethane	j T@4@	T	µo/r	<T	<T	<T	<T	<T

Analytical Results

hRt @le@x: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: RINSATE-4	TRIP3	TRIP4	GW19	DUP4
				Client sampling date / time: F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-031	EM1104286-032	EM1104286-033	EM1104286-034	EM1104286-035
EP074E: Halogenated Aliphatic Compounds - Continued								
cis-1.2-Dichloroethene	1Tl @8@	T	µo/r	<T	<T	<T	<T	<T
1.1.1-Trichloroethane	j 1@T@	T	µo/r	<T	<T	<T	<T	<T
1.1-Dichloropropylene	Tl Y@a@	T	µo/r	<T	<T	<T	<T	<T
Carbon Tetrachloride	Tl @Y@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichloroethane	10j @l @	T	µo/r	<T	<T	<T	<T	<T
Trichloroethene	j 8@1@	T	µo/r	<T	<T	<T	<T	<T
Dibromomethane	j 4@T@	T	µo/r	<T	<T	<T	<T	<T
1.1.2-Trichloroethane	j 8@0@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichloropropane	14F@a@	T	µo/r	<T	<T	<T	<T	<T
Tetrachloroethene	1Fj @a@	T	µo/r	<T	<T	<T	<T	<T
1.1.1.2-Tetrachloroethane	l Y0@0@	T	µo/r	<T	<T	<T	<T	<T
trans-1.4-Dichloro-2-butene	110@j @	T	µo/r	<T	<T	<T	<T	<T
cis-1.4-Dichloro-2-butene	14j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.1.2.2-Tetrachloroethane	j 8@4@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichloropropane	8l @a@	T	µo/r	<T	<T	<T	<T	<T
Pentachloroethane	j l @1@	T	µo/r	<T	<T	<T	<T	<T
1.2-Dibromo-3-chloropropane	8l @F@	T	µo/r	<T	<T	<T	<T	<T
Hexachlorobutadiene	aj @a@	T	µo/r	<T	<T	<T	<T	<T
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	10a@0@	T	µo/r	<T	<T	<T	<T	8
Bromobenzene	10a@l @	T	µo/r	<T	<T	<T	<T	<T
2-Chlorotoluene	8T@8@	T	µo/r	<T	<T	<T	<T	<T
4-Chlorotoluene	10l @Y@	T	µo/r	<T	<T	<T	<T	<T
1.3-Dichlorobenzene	T41@Y@	T	µo/r	<T	<T	<T	<T	<T
1.4-Dichlorobenzene	10l @l @	T	µo/r	<T	<T	<T	<T	<T
1.2-Dichlorobenzene	8T@0@	T	µo/r	<T	<T	<T	<T	<T
1.2.4-Trichlorobenzene	1F0@F@	T	µo/r	<T	<T	<T	<T	<T
1.2.3-Trichlorobenzene	aj @1@	T	µo/r	<T	<T	<T	<T	<T
EP074G: Trihalomethanes								
Chloroform	l j @ @	T	µo/r	<T	<T	<T	<T	5
Bromodichloromethane	j T@j @	T	µo/r	<T	<T	<T	<T	<T
Dibromochloromethane	1F4@a@	T	µo/r	<T	<T	<T	<T	<T
Bromoform	j T@T@	T	µo/r	<T	<T	<T	<T	<T
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	81@0@	1E0	µo/r	<1E0	<1E0	<1E0	<1E0	25.5
Acenaphthylene	F0a@l @	1E0	µo/r	<1E0	<1E0	<1E0	<1E0	<1E0
Acenaphthene	aY@F@	1E0	µo/r	<1E0	<1E0	<1E0	<1E0	<1E0
Fluorene	al @Y@	1E0	µo/r	<1E0	<1E0	<1E0	<1E0	<1E0

Analytical Results

hRt @le@x: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: RINSATE-4	TRIP3	TRIP4	GW19	DUP4
Client sampling date / time				F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
				EM1104286-031	EM1104286-032	EM1104286-033	EM1104286-034	EM1104286-035
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	aT@1@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Anthracene	1F0@F@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Fluoranthene	F0l @4@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Pyrene	1F8@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benz(a)anthracene	Tl @T@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Chrysene	F1a@1@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(b)fluoranthene	F0T@8@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(k)fluoranthene	F0j @a@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(a)pyrene	T0@F@	0BT	µo/r	<0B	<0BT	<0BT	<0BT	<0B
Indeno(1.2.3.cd)pyrene	18Y@8@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Dibenz(a.h)anthracene	TY@0@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
Benzo(g.h.i)perylene	181@4@	1B0	µo/r	<1B0	<1B0	<1B0	<1B0	<1B0
^ Sum of polycyclic aromatic hydrocarbons	@@@	0BT	µo/r	<1Bl	<1B0	<1B0	<1Bl	25.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	@@@	F0	µo/r	<F0	<F0	<F0	<F0	480
C10 - C14 Fraction	@@@	T0	µo/r	<T0	<T0	<T0	<T0	2910
C15 - C28 Fraction	@@@	100	µo/r	<100	<100	<100	1110	1500
C29 - C36 Fraction	@@@	T0	µo/r	<T0	<T0	<T0	140	200
^ C10 - C36 Fraction (sum)	@@@	T0	µo/r	<T0	<T0	<T0	1250	4610
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	@@@	F0	µo/r	<F0	<F0	<F0	<F0	480
^ C6 - C10 Fraction minus BTEX (F1)	@@@	F0	µo/r	<F0	<F0	<F0	<F0	60
>C10 - C16 Fraction	@@@	100	µo/r	<100	<100	<100	120	1700
>C16 - C34 Fraction	@@@	100	µo/r	<100	<100	<100	1100	1370
>C34 - C40 Fraction	@@@	100	µo/r	<100	<100	<100	<100	100
^ >C10 - C40 Fraction (sum)	@@@	100	µo/r	<100	<100	<100	1220	3170
EP080: BTEXN								
Benzene	j 1@Y@	1	µo/r	<1	<1	<1	<1	334
Toluene	10a@a@	F	µo/r	<F	<F	<F	<F	63
Ethylbenzene	100@1@	F	µo/r	<F	<F	<F	<F	3
meta- & para-Xylene	10a@a@310l @F@	F	µo/r	<F	<F	<F	<F	11
ortho-Xylene	8T@j @	F	µo/r	<F	<F	<F	<F	9
^ Total Xylenes	1YY0@0@	F	µo/r	<F	<F	<F	<F	20
^ Sum of BTEX	@@@	1	µo/r	<1	<1	<1	<1	420
Naphthalene	81@0@	T	µo/r	<T	<T	<T	<T	36
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	94.5	94.9	98.1	93.7	104

Analytical Results

hRt @le@x: **WATER**

			Client sample ID	RINSATE-4	TRIP3	TRIP4	GW19	DUP4
			Client sampling date / time	F1@ V@0113lTf00	F0@ V@0113lTf00	F1@ V@0113lTf00	F0@ V@0113lTf00	F0@ V@0113lTf00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104286-031**	**EM1104286-032**	**EM1104286-033**	**EM1104286-034**	**EM1104286-035**
EP074S: VOC Surrogates - Continued								
Toluene-D8	F0Yj @ @	0Bl	%	**97.5**	**95.1**	**97.6**	**97.4**	**101**
4-Bromofluorobenzene	4l 0@0@	0Bl	%	**96.4**	**94.9**	**95.1**	**95.0**	**97.7**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	1Y1Fj @a@	0Bl	%	**28.4**	**34.7**	**22.7**	**15.7**	**13.9**
2-Chlorophenol-D4	8Y8T1@Y@	0Bl	%	**82.3**	**87.3**	**69.7**	**33.4**	**101**
2.4.6-Tribromophenol	11a@8@	0Bl	%	**84.0**	**114**	**114**	**102**	**109**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	YF1@0@	0Bl	%	**65.7**	**99.0**	**94.0**	**68.5**	**108**
Anthracene-d10	1j 18@ @	0Bl	%	**79.0**	**106**	**106**	**86.3**	**91.9**
4-Terphenyl-d14	1j 1a@1@	0Bl	%	**66.7**	**109**	**75.7**	**77.0**	**78.2**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	1j 0l 0@j @	0Bl	%	**100**	**102**	**106**	**102**	**110**
Toluene-D8	F0Yj @ @	0Bl	%	**93.2**	**90.2**	**92.2**	**93.9**	**95.6**
4-Bromofluorobenzene	4l 0@0@	0Bl	%	**98.8**	**94.4**	**95.0**	**95.1**	**96.3**

Surrogate Control Limits

hRt @Me@x: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	1j 0l 0@j @	j F	1YF
Toluene-D8	F0Yj @ @	j 4	1Fa
4-Bromofluorobenzene	4l 0@0@	j 0	1YF
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	1Y1Fj @a@	10	Ta
2-Chlorophenol-D4	8Y8T1@Y@	10	1F4
2.4.6-Tribromophenol	11a@8@	Fl	1Ya
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	YF1@0@	YF	1FF
Anthracene-d10	1j 18@l @	Y4	1Yl
4-Terphenyl-d14	1j 1a@1@	Y4	140
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	1j 0l 0@j @	j Y	1Y1
Toluene-D8	F0Yj @ @	j F	1F4
4-Bromofluorobenzene	4l 0@0@	j 0	1Fl

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: Environmental Earth Sciences	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle):
OFFICE: P.O.BOX 2253, FOOTSCRAY , VIC, 3011	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? No N/A
PROJECT: 210074 ALBERT PARK GAS WORKS	ALS QUOTE NO.: ME/015/11 V3	COC SEQUENCE NUMBER (Circle)
ORDER NUMBER:		CO 1 2 3 4 5
PROJECT MANAGER: DAVID JAMES	CONTACT PH: 0437 033 796	OI 1 2 3 4 5
SAMPLER:	SAMPLER MOBILE: 0437 033 796	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG & ESDAT	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		

RELINQUISHED BY: DJ	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 20/4/2011 3.30pm & 21/4/2011 10.30am	DATE/TIME:	DATE/TIME:	DATE/TIME: 21/4 12+10m

FOR LABORATORY USE ONLY (Circle): Free liquids / frozen ice bricks present upon receipt? No N/A — 0 — 0 — 2-6-6+4 — Cooler/Sample Temperature on Receipt: — Other comment:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).													Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH, TDS, Free Cyanide, Total cyanide, WAD cyanide, Sulphide	NT-1 package - Ca, Mg, Na, K	NT-2 Package - Cl, SO4, Alk	NT-3 Package - NO2, NO3, Fl, Reactive P	NH4 - Ammonium - (field pH and field temperature must be recorded)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B, Mn & Hg (ALS recommends filtered and acidify from red/green metals bottle)	Hexavalent Chromium	W-10 Package - TPH/BTEX/PAH Plus VOC	Free Cyanide, Total cyanide, WAD cyanide, Sulphide	Sample Ph	Sample Temp			
1	GW3	20/04/2011			8	X	X	X	X	X	X	X	X		6.34	18.60			
2	GW4	20/04/2011			8	X	X	X	X	X	X	X	X		5.20	18.60			
3	GW9	19/04/2011			8	X	X	X	X	X	X	X	X		6.53	20.80			
4	GW10	20/04/2011			8	X	X	X	X	X	X	X	X		5.03	18.70			
5	GW11	20/04/2011			8	X	X	X	X	X	X	X	X		5.62	18.60			
6	GW12	19/04/2011			8	X	X	X	X	X	X	X	X		6.67	19.10			
7	GW13	20/04/2011			8	X	X	X	X	X	X	X	X		6.26	18.30			
8	GW14	20/04/2011			8	X	X	X	X	X	X	X	X		6.62	19.40			
9	GW15	20/04/2011			8	X	X	X	X	X	X	X	X		5.74	18.10			
10	GW16	20/04/2011			8	X	X	X	X	X	X	X	X		6.89	18.50			
11	GW21	20/04/2011			8	X	X	X	X	X	X	X	X		5.80	17.60			Please forward SPLIT2 to SGS Australia Pty Ltd with copy of COC. [34 Norfolk Court, Coburg Vic 3058]
12	GW22	20/04/2011			8	X	X	X	X	X	X	X	X		6.51	18.00			
13	GW23	20/04/2011			8	X	X	X	X	X	X	X	X		6.51	17.80			
14	GW24	20/04/2011			8	X	X	X	X	X	X	X	X		7.07	19.50			
15	GW25	20/04/2011			8	X	X	X	X	X	X	X	X		6.47	20.40			
16	GW27	20/04/2011			8	X	X	X	X	X	X	X	X		7.29	18.60			
17	GW36	20/04/2011			8	X	X	X	X	X	X	X	X		7.10	18.10			
—	GW37	19/04/2011			8	X	X	X	X	X	X	X	X		7.08	18.90			
—	GW38	19/04/2011			8	X	X	X	X	X	X	X	X		6.97	18.80			
18	GW39	20/04/2011			8	X	X	X	X	X	X	X	X		6.71	18.10			
19	GW40	20/04/2011			8	X	X	X	X	X	X	X	X		7.09	19.70			
20	GW41	20/04/2011			8	X	X	X	X	X	X	X	X		7.28	19.20			
21	GW42D	21/04/2011			8	X	X	X	X	X	X	X	X		6.24	18.20			
22	GW43D	20/04/2011			8	X	X	X	X	X	X	X	X		6.54	19.80			
23	GW44D	20/04/2011			8	X	X	X	X	X	X	X	X		6.59	18.60			
24	DUP1	20/04/2011			8	X	X	X	X	X	X	X	X		6.34	18.60			
25	SPLIT1	20/04/2011			8	X	X	X	X	X	X	X	X		6.34	18.60			
26	DUP3	20/04/2011			8	X	X	X	X	X	X	X	X		7.07	19.50			
27	SPLIT3	20/04/2011			8	X	X	X	X	X	X	X	X		7.07	19.50			
28	SPLIT4	21/04/2011			8	X	X	X	X	X	X	X	X		6.24	18.20			
~~29~~	SPLIT4	21/04/2011			8	X	X	X	X	X	X	X	X		6.24	18.20			
29 ~~30~~	RINSATE-2	19/04/2011			3								X						
30 ~~31~~	RINSATE-3	20/04/2011			7					X	X	X	X	X					
31 ~~32~~	RINSATE-4	21/04/2011			7					X	X	X	X	X					
32 ~~33~~	TRIP3	20/04/2011			3								X						
33 ~~34~~	TRIP4	21/04/2011			3								X						
					271	31	31	31	31	33	33		36	2					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Extra 34 ~~35~~ GW19 Dup4 — same analysis as per David

Environmental Division
Melbourne
Work Order
EM1104286

Telephone : +61-3-8549 9600

QUALITY CONTROL REPORT

Work Order	: **EM1104Amm**	Page	: 1 of 6L
t NeVdNeVl	: **1**		
i lneEy	: **ERTLHORMERSt C Et HS5 p(lER(Ep**	bar otayotC	: v EmntoED eEyal MmmsmoE u elr octEe
i oEyaRy	: u A MVI JM SVu v W	i oEyaRy	: i atol h alsd
V. . tess	: PGBOXB2 5536 FBBTW AVY I J , VUWTAVbJV 6L11	V. . tess	: 0 h esyall A. W4trEgmale l J Vcsytalma 61p1
v7Dan	: . -aDesj eesn0n@	v7Dan	: RatolQ alsdj alseEmntoBoD
Tele4doEe	: w+1 9+8p1+++	Tele4doEe	: w+17678309 9+L8
FaRsnDne	: w+1 L6 9+8p1800	FaRsnDne	: w+17678309 9+L1
Pto-eRy	: 51LLp0 VbXv AT PVAK GVWh BAKW	Qi bemel	: Nv Pu 1999 WRde. cle X(6) aE. VbWQi W6 teqcnteDeEy
Wye	: 7777		
i 7B7 EcDr et	: 7777	Maye WaD4les AeRemne.	: 517/PA75L11
WaD4let	: 7777	Jssce Maye	: 6L7u VY75L11
Bt. et EcDr et	: 7777		
		NoQof saD4les teRemne.	: 63
Qcoye EcDr et	: u v/L13/11 I 6	NoQof saD4les aEalQse.	: 63

Tdns te4oty sc4etse. es aEC 4tennocs te4oty(s) z nd ydns tefeteERe O Aesclys a44lC yo yde saD4le(s) as scr Dnye. O VII 4ages of ydns te4oty dame r eeE RdeRke. aE. a44tome. fot teleaseO

Tdns QcalnyCi oEytol Ae4otyRoEyanEs yde folloz nEg nEfotDaynoE:

- bar otayotCMc4lnRaye (MUP) Ae4oty; Aelayme PetReEyage MnffeteERe (APM) aE. VRRe4yaERe brDnys
- u eydo. XlaEk (u X) aE. bar otayotCi oEytol W4nke (bi W) Ae4oty; AeRometCaE. VRRe4yaERe brDnys
- u aytnx W4nke (u W) Ae4oty; AeRometCaE. VRRe4yaERe brDnys

NVTV VRRte. nye. bar otayotC853

Tdns . oRcDeEy das r eeE eleRytoEnRallC snglEe. r C yde acydotn@. snglEaytnes nE. nRaye. r eloz O vleRytoEnR snglEnEg das r eeE Rattne. ocynE RoD4lnaERe z nd 4toRe. ctes s4eRtne. nE 51 i FA Paty11O

VRRte. nye. fot RoD4lnaERe z nd JWB/Jv i 1pL53O

Signatories

Signatories	*Position*	*Accreditation Category*
MntaEnFetEaE. o	WeEnot JEotgaEnRi deDnsy	u elr octEe JEotgaEnRs
v tnRi dac	u eyals TeaD bea. et	u elr octEe JEotgaEnRs
HetDaE bnE	bar otayotCi oot. nEayot	u elr octEe JEotgaEnRs
NaERCh aEg	WeEnot WeDnnolayne JEsytcDeEyi deDnsy	u elr octEe BtgaEnRs
NnkknWye4Enez skn	WeEnot JEotgaEnRJEsytcDeEyi deDnsy	u elr octEe JEotgaEnRs
WyenseE u RGtayd	bar otayotCu aEaget	u elr octEe BtgaEnRs
2nEgnnE bnE	WeEnot BtgaEnRi deDnsy	u elr octEe BtgaEnRs

General Comments

Tde aEalOynRal 4toRe. ctes cse. r C yde v EmtloEDeEyal MmmsmoE dame r eeE . emelo4e. ftoD esyar lnsde. nEyetEaymoEallC teRogEn@. 4toRe. ctes scRd as ydose 4cr lnsde. r C yde UWvPV, VPHV, VW aE. Nv Pu O JE docse . emelo4e. 4toRe. ctes ate eD4loCe. nE yde ar seERe of . oRcDeEye. syaE. at. s ot r CRmeEyteqcesyO

h dete Dorsyc te . eyetDnEaymoE das r eeE 4etfotDe. , tesclys ate te4otye. oE a . tCz ergdyr asrsO

h dete a te4otye. less ydaE (<) tesclyrs drgdet ydaE yde bBA, ydrs DaCr e . ce yo 4trDatCsaD4le exytaRy. rgesyaye . rncymoE aE. /ot nEscffmeEysaD4le fot aEalOsrsO

h dete yde bBA of a te4otye. tescly. nffets ftoD syaE. at. bBA, ydrs DaCr e . ce yo drgd Dorsyc te RoEyeEy, nEscffmRmeEysaD4le (te. cRe. z ergdyeD4loCe.) ot Daytrx nEyetfeteERReO

KeC: VEoECDocs = Aefets yo saD4les z drnRd ate Eoys4eRmnRallC4atyof ydrs z otk ot. et r cyfotDe. 4atyof yde Qi 4toRess loy
i VWNcDr et = i VWtegrsytCEcDr et ftoD . ayar ase DarEyarEe. r Ci deDrnRal Vr sytaRys WetrmResOTde i deDrnRal Vr sytaRys WetrmRe rs a . rnrsrnoE of yde VDetrnRaE i deDrnRal WoRreyCO
bBA = brnDryof te4otyrEg
APM = Aelaymne PetReEyage MrffeteERe
# = JE. nRayes farle. Qi

Laboratory Duplicate (DUP) Report

Tde qcalnyC RoEytol yetD bar otayotC Mc4lnRaye tefets yo a taE. oDIC seleRye. nEytalar otayotC s4lnyO bar otayotC . c4lnRayes 4tomn e nEfotDayroE tegat. nEg Deydo. 4teRtsnoE aE. saD4le deyetogeEenyCO Tde 4etDnye. taEges fot yde Aelaynne PetReEy Memayro E (APM) of bar otayotC Mc4lnRayes ate s4eRfine. nE VbW u eydo. Qh J7v N/68 aE. ate . e4eE. eEy oE yde DagEnyc. e of tesclys nE RoD4atnsoE yo yde lemel of te4otyEg: Aescly < 1L yDes bBA:7 No brDny, Aesclyr eyz eeE 1L aE. 5L yDes bBA:7L% 73L%; Aescly> 5L yDes bBA:7L% 75L%O

Wcr 7u aytnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Et 00Q: 75 8) (Col: 1anl nDai									
v u 11L05087LL1	VEoECDocs	v VLL3: 4H I alce	7777	L0.1	4H UEry	80.6	80.3	L05	L% 75L%
v u 11L058+7LL3	Gh 11	v VLL3: 4H I alce	7777	L0.1	4H UEry	30.3	30.+	L05	L% 75L%
Et 00Q: 75 8) (Col: 1anl nDmi									
v u 11L058+7L1+	Gh 5p	v VLL3: 4H I alce	7777	L0.1	4H UEry	p0.L	p05.8	L06	L% 75L%
v u 11L058+7L53	WPbJT1	v VLL3: 4H I alce	7777	L0.1	4H UEry	+0.L	+0.1	L05	L% 75L%
Et 01Q: Solsv63PPowyed povBIP 8) (Col: 1anl m0mi									
v u 11L058+7LL6	Gh 9	v VL13H: Toyal Mnssolme. Woln s j 18L°i	GJW751L7L1L	3	Dg/b	308	310	+0	L% 75L%
Et 01Q: Solsv63PPowyed povBIP 8) (Col: 1anQa0ni									
v u 11L050p7LL1	VEoECDocs	v VL13H: Toyal Mnssolme. Woln s j 18L°i	GJW751L7L1L	3	Dg/b	053LL	059LL	L09	L% 75L%
v u 11L058+7LL1	Gh 6	v VL13H: Toyal Mnssolme. Woln s j 18L°i	GJW751L7L1L	3	Dg/b	601L	630L	0.2	L% 75L%
Et 01Q: Solsv63PPowyed povBIP 8) (Col: 1anQa0ai									
v u 11L058+7L10	Gh 50	v VL13H: Toyal Mnssolme. Woln s j 18L°i	GJW751L7L1L	3	Dg/b	006L	00+L	L0+	L% 75L%
v u 11L058+7L53	WPbJT1	v VL13H: Toyal Mnssolme. Woln s j 18L°i	GJW751L7L1L	3	Dg/b	61LL	615L	L0+	L% 75L%
E60 lab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4a1i									
v u 11L05867L56	VEoECDocs	v ML6p7P: HC. toxn e VlkalnEnyCas i ai B6	Mu B751L7LL1	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: i atr oEaye VlkalnEnyCas i ai B6	68157657+	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: XnRatr oEaye VlkalnEnyCas i ai B6	p173576	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	<1	<1	L0.2	No brDny
v u 11L05837LL6	VEoECDocs	v ML6p7P: HC. toxn e VlkalnEnyCas i ai B6	Mu B751L7LL1	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: i atr oEaye VlkalnEnyCas i ai B6	68157657+	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: XnRatr oEaye VlkalnEnyCas i ai B6	p173576	1	Dg/b	1+8	1+8	L0.2	L% 75L%
		v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	1+8	1+8	L0.2	L% 75L%
E60 lab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4aAi									
v u 11L058+7LL9	Gh 13	v ML6p7P: HC. toxn e VlkalnEnyCas i ai B6	Mu B751L7LL1	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: i atr oEaye VlkalnEnyCas i ai B6	68157657+	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: XnRatr oEaye VlkalnEnyCas i ai B6	p173576	1	Dg/b	5+	5+	L0.2	L% 75L%
		v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	5+	5+	L0.2	L% 75L%
v u 11L058+7L18	Gh 69	v ML6p7P: HC. toxn e VlkalnEnyCas i ai B6	Mu B751L7LL1	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: i atr oEaye VlkalnEnyCas i ai B6	68157657+	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: XnRatr oEaye VlkalnEnyCas i ai B6	p173576	1	Dg/b	513	51+	L03	L% 75L%
		v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	513	51+	L03	L% 75L%
E60 lab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4a4i									
v u 11L058+7L60	Gh 19	v ML6p7P: HC. toxn e VlkalnEnyCas i ai B6	Mu B751L7LL1	1	Dg/b	<1	<1	L0.2	No brDny
		v ML6p7P: i atr oEaye VlkalnEnyCas i ai B6	68157657+	1	Dg/b	<1	<1	L0.2	No brDny

Wcr 7u ay tnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
E60lab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4a4i uf oVl3Vced									
v u 11L058+7L60	Gh 19	v ML6p7P: XnRatr o Eaye VlkalnEnyCas i ai B6	p173576	1	Dg/b	+8	+9	1G3	L% 75L%
		v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	+8	+9	1G3	L% 75L%
E60412 : pcv-sle 8ScrG3dl3N elr3f i sP pO4 AuG9 6 t 8) (Col: 1an4A4Qi									
v u 11L05+07LL1	VEoECDocs	v ML01G: Wclfaye as WB0 7Tctr n rnDeytnR	108L87p978	1	Dg/b	115LL	1L3LL	+G9	L% 75L%
v u 11L058L7LL1	VEoECDocs	v ML01G: Wclfaye as WB0 7Tctr n rnDeytnR	108L87p978	1	Dg/b	8	8	L01	No bnDry
E60412 : pcv-sle 8ScrG3dl3N elr3f i sP pO4 AuG9 6 t 8) (Col: 1an4AQDi									
v u 11L058+7LL1	Gh 6	v ML01G: Wclfaye as WB0 7Tctr n rnDeytnR	108L87p978	1	Dg/b	5LpL	515L	5G3	L% 75L%
v u 11L058+7L1L	Gh 1+	v ML01G: Wclfaye as WB0 7Tctr n rnDeytnR	108L87p978	1	Dg/b	0+	0p	L01	L% 75L%
E604Q2 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4A44i									
v u 11L05+07LL1	VEoECDocs	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	686LL	680LL	L05	L% 75L%
v u 11L058L7LL1	VEoECDocs	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	3+	+L	+03	L% 75L%
E604Q2 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4A4Di									
v u 11L058+7LL1	Gh 6	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	+0	+0	L01	L% 75L%
v u 11L058+7L1L	Gh 1+	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	16	16	L01	L% 73L%
E604Q2 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4AQ4i									
v u 11L058+7L51	Gh 05M	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	668L	656L	0G3	L% 75L%
v u 11L06L57LL+	VEoECDocs	v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	1p0	1+6	+G3	L% 75L%
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4A4l i									
v u 11L05+07LL1	VEoECDocs	v ML96F: i alRtcD	p00L7pL75	1	Dg/b	680	680	L01	L% 75L%
		v ML96F: u agEesrtcD	p0697937O	1	Dg/b	191	191	L01	L% 75L%
		v ML96F: Wo. rtcD	p00L75673	1	Dg/b	615LL	615LL	L01	L% 75L%
		v ML96F: PoyassrtcD	p00L7L97p	1	Dg/b	6L	6L	L01	L% 75L%
v u 11L058L7LL1	VEoECDocs	v ML96F: i alRtcD	p00L7pL75	1	Dg/b	08	08	L01	L% 75L%
		v ML96F: u agEesrtcD	p0697937O	1	Dg/b	6L	61	L01	L% 75L%
		v ML96F: Wo. rtcD	p00L75673	1	Dg/b	+6	+5	L01	L% 75L%
		v ML96F: PoyassrtcD	p00L7L97p	1	Dg/b	5	5	L01	No bnDry
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4A4mi									
v u 11L058+7LL1	Gh 6	v ML96F: i alRtcD	p00L7pL75	1	Dg/b	565	5pp	1pG0	L% 75L%
		v ML96F: u agEesrtcD	p0697937O	1	Dg/b	06	31	1+01	L% 75L%
		v ML96F: Wo. rtcD	p00L75673	1	Dg/b	+5	+5	L01	L% 75L%
		v ML96F: PoyassrtcD	p00L7L97p	1	Dg/b	1+	19	51G0	L% 73L%
v u 11L058+7L1L	Gh 1+	v ML96F: i alRtcD	p00L7pL75	1	Dg/b	+	+	L01	No bnDry
		v ML96F: u agEesrtcD	p0697937O	1	Dg/b	+	+	L01	No bnDry
		v ML96F: Wo. rtcD	p00L75673	1	Dg/b	01	06	30	L% 75L%
		v ML96F: PoyassrtcD	p00L7L97p	1	Dg/b	p	p	L01	No bnDry
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4AQl i									
v u 11L058+7L51	Gh 05M	v ML96F: i alRtcD	p00L7pL75	1	Dg/b	6p3	6pp	LG+	L% 75L%
		v ML96F: u agEesrtcD	p0697937O	1	Dg/b	p8p	p09	0G9	L% 75L%
		v ML96F: Wo. rtcD	p00L75673	1	Dg/b	503L	56pL	601	L% 75L%

Wcr 7u ay tnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
E6 0DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4ACi i ufoVl3/ced									
v u 11L058+7L51	Gh 05M	v ML96F: PoyassrcD	p00L7L97p	1	Dg/b	51p	553	6G3	L% 75L%
v u 11L06L57LL+	VEoECDocs	v ML96F: i alRrcD	p00L7pL75	1	Dg/b	8	p	LQ1	No brDry
		v ML96F: u agEesrcD	p0697937O	1	Dg/b	8	p	LQ1	No brDry
		v ML96F: Wo. rcD	p00L75673	1	Dg/b	6L3	5p3	1LG5	L% 75L%
		v ML96F: PoyassrcD	p00L7L97p	1	Dg/b	p	p	LQ1	No brDry
E2 0A0F: 63PPowyed MelsvP G9 l(buMp 8) (Col: 1an4Dm0i									
v u 11L05817LL1	VEoECDocs	v GL5LV7F: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	<LQLL1	LQ1	No brDry
		v GL5LV7F: VtseErR	p00L76875	LQL1	Dg/b	<LQL1	<LQL1	LQ1	No brDry
		v GL5LV7F: i or aly	p00L70870	LQL1	Dg/b	LQ15	LQ10	90	L% 73L%
		v GL5LV7F: i o44et	p00L73L78	LQL1	Dg/b	LQL3	LQL3	LQ1	No brDry
		v GL5LV7F: bea.	p0697957I	LQL1	Dg/b	LQL1	LQL5	LQ1	No brDry
		v GL5LV7F: u aEgaEese	p06979+73	LQL1	Dg/b	LQ58	LQ6L	1G8	L% 75L%
		v GL5LV7F: NnRkel	p00L7L57L	LQL1	Dg/b	LQLp	LQL8	100	No brDry
		v GL5LV7F: ZnER	p00L7++7+	LQL3	Dg/b	LQ16	LQ16	LQ1	No brDry
		v GL5LV7F: VlcDrEcD	p05979L73	LQ1	Dg/b	LQ0	LQ+	55O	No brDry
		v GL5LV7F: WeleEcD	pp8570975	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No brDry
		v GL5LV7F: XotoE	p00L70578	LQ3	Dg/b	<LQ3	<LQ3	LQ1	No brDry
		v GL5LV7F: JtoE	p0697897+	LQ3	Dg/b	LQp	LQ9	53Q	No brDry
v u 11L058+7LL9	Gh 13	v GL5LV7F: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	<LQLL1	LQ1	No brDry
		v GL5LV7F: VtseErR	p00L76875	LQL1	Dg/b	<LQL1	<LQL1	LQ1	No brDry
		v GL5LV7F: i or aly	p00L70870	LQL1	Dg/b	LQL8	LQL8	LQ1	No brDry
		v GL5LV7F: i o44et	p00L73L78	LQL1	Dg/b	LQL5	LQL5	LQ1	No brDry
		v GL5LV7F: bea.	p0697957I	LQL1	Dg/b	LQL1	LQL1	LQ1	No brDry
		v GL5LV7F: u aEgaEese	p06979+73	LQL1	Dg/b	LQ38	LQ39	LQ1	L% 75L%
		v GL5LV7F: NnRkel	p00L7L57L	LQL1	Dg/b	LQ1L	LQ1L	LQ1	L% 73L%
		v GL5LV7F: ZnER	p00L7++7+	LQL3	Dg/b	LQ1+	LQ1+	LQ1	No brDry
		v GL5LV7F: VlcDrEcD	p05979L73	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No brDry
		v GL5LV7F: WeleEcD	pp8570975	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No brDry
		v GL5LV7F: XotoE	p00L70578	LQ3	Dg/b	1Q5	1Q6	1G5	L% 75L%
		v GL5LV7F: JtoE	p0697897+	LQ3	Dg/b	<LQ3	<LQ3	LQ1	No brDry
E2 0A0F: 63PPowyed MelsvP G9 l(buMp 8) (Col: 1an4DmAi									
v u 11L058+7L5L	Gh 01	v GL5LV7F: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	<LQLL1	LQ1	No brDry
		v GL5LV7F: VtseErR	p00L76875	LQL1	Dg/b	LQ10	LQ16	LQ1	L% 73L%
		v GL5LV7F: i or aly	p00L70870	LQL1	Dg/b	LQL1	LQL1	LQ1	No brDry
		v GL5LV7F: i o44et	p00L73L78	LQL1	Dg/b	LQL1	LQL1	LQ1	No brDry
		v GL5LV7F: bea.	p0697957I	LQL1	Dg/b	LQL1	<LQL1	LQ1	No brDry
		v GL5LV7F: u aEgaEese	p06979+73	LQL1	Dg/b	LQ65	LQ65	LQ1	L% 75L%
		v GL5LV7F: NnRkel	p00L7L57L	LQL1	Dg/b	<LQL1	LQL1	LQ1	No brDry
		v GL5LV7F: ZnER	p00L7++7+	LQL3	Dg/b	<LQL3	<LQL3	LQ1	No brDry

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
E2 0A0F: 63PPoyed MelsvP G9 l(buMp 8) (Col: 1an4DmAi ufoVl3Vced									
vu 11L058+7L5L	Gh 01	vGL5LV7F: VlcDrEncD	p05979L73	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry
		vGL5LV7F: WeleEncD	pp8570975	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry
		vGL5LV7F: XotoE	p00L70578	L01.3	Dg/b	L0p	L00	30p	L% 73L%
		vGL5LV7F: JtoE	p0697897+	L01.3	Dg/b	<L01.3	<L01.3	L01.	No bnDry
vu 11L058+7L60	Gh 19	vGL5LV7F: i a. DrcD	p00L70679	L01LL1	Dg/b	<L01LL1	<L01LL1	L01.	No bnDry
		vGL5LV7F: VtseErR	p00L76875	L01L1	Dg/b	L0p99	L08L+	10.	L% 75L%
		vGL5LV7F: i or aly	p00L70870	L01L1	Dg/b	L01p9	L0180	30+	L% 75L%
		vGL5LV7F: i o44et	p00L73L78	L01L1	Dg/b	L01L1	L01L5	L01.	No bnDry
		vGL5LV7F: bea.	p0697957l	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7F: u aEgaEese	p06979+73	L01L1	Dg/b	10G5	16G8	60.	L% 75L%
		vGL5LV7F: NnRkel	p00L7L57L	L01L1	Dg/b	L0151	L0155	L01.	L% 75L%
		vGL5LV7F: ZnER	p00L7++7+	L01L3	Dg/b	L0159	L0l6L	10.	L% 75L%
		vGL5LV7F: VlcDrEncD	p05979L73	L01.1	Dg/b	L0p	L018	L01.	L% 73L%
		vGL5LV7F: WeleEncD	pp8570975	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry
		vGL5LV7F: XotoE	p00L70578	L01.3	Dg/b	1G8+	1G80	1G	L% 75L%
		vGL5LV7F: JtoE	p0697897+	L01.3	Dg/b	6L9	6LL	6G	L% 75L%
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi									
vu 11L056p7LL6	VEoECDocs	vGL5LV7T: i a. DrcD	p00L70679	L01LL1	Dg/b	<L01LL1	<L01LL1	L01.	No bnDry
		vGL5LV7T: VtseErR	p00L76875	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: i or aly	p00L70870	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: i o44et	p00L73L78	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: bea.	p0697957l	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: u aEgaEese	p06979+73	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: NnRkel	p00L7L57L	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: ZnER	p00L7++7+	L01L3	Dg/b	<L01L3	<L01L3	L01.	No bnDry
		vGL5LV7T: VlcDrEncD	p05979L73	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry
		vGL5LV7T: WeleEncD	pp8570975	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry
		vGL5LV7T: XotoE	p00L70578	L01.3	Dg/b	<L01.3	<L01.3	L01.	No bnDry
		vGL5LV7T: JtoE	p0697897+	L01.3	Dg/b	<L01.3	<L01.3	L01.	No bnDry
vu 11L058p7LL6	VEoECDocs	vGL5LV7T: i a. DrcD	p00L70679	L01LL1	Dg/b	<L01LL1	<L01LL1	L01.	No bnDry
		vGL5LV7T: VtseErR	p00L76875	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: i or aly	p00L70870	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: i o44et	p00L73L78	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: bea.	p0697957l	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: u aEgaEese	p06979+73	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: NnRkel	p00L7L57L	L01L1	Dg/b	<L01L1	<L01L1	L01.	No bnDry
		vGL5LV7T: ZnER	p00L7++7+	L01L3	Dg/b	<L01L3	<L01L3	L01.	No bnDry
		vGL5LV7T: VlcDrEncD	p05979L73	L01.1	Dg/b	L01.1	L01.1	L01.	No bnDry
		vGL5LV7T: WeleEncD	pp8570975	L01.1	Dg/b	<L01.1	<L01.1	L01.	No bnDry

Wcr 7u ay tnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi uf oVl3Vced									
v u 11L058p7LL6	VEoECDocs	v GL5LV7T: XotoE	p00L70578	LQ0.3	Dg/b	<LQ0.3	<LQ0.3	LQ0	No bnDry
		v GL5LV7T: JtoE	p0697897+	LQ0.3	Dg/b	<LQ0.3	<LQ0.3	LQ0	No bnDry
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4DaDi									
v u 11L05817LL1	VEoECDocs	v GL63F: u etRctC	p06979p7+	LQ0LL1	Dg/b	LQ0LL6	LQ0LL5	LQ0	No bnDry
v u 11L058+7LL9	Gh 13	v GL63F: u etRctC	p06979p7+	LQ0LL1	Dg/b	<LQ0LL1	<LQ0LL1	LQ0	No bnDry
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4Dm1i									
v u 11L058+7L51	Gh 05M	v GL63F: u etRctC	p06979p7+	LQ0LL1	Dg/b	LQ0LL5	LQ0LL5	LQ0	No bnDry
v u 11L058+7L60	Gh 19	v GL63F: u etRctC	p06979p7+	LQ0LL1	Dg/b	<LQ0LL1	<LQ0LL1	LQ0	No bnDry
E2 0l QS: SolsvHef oyersGve Merf cr9 G9 FLMp 8) (Col: 1aa0m11i									
v u 11L056p7LL6	VEoECDocs	v GL63T: u etRctC	p06979p7+	LQ0LL1	Dg/b	<LQ0LL1	<LQ0LL1	LQ0	No bnDry
v u 11L058+7L61	AJNWTv70	v GL63T: u etRctC	p06979p7+	LQ0LL1	Dg/b	<LQ0LL1	<LQ0LL1	LQ0	No bnDry
E2 0Q0F: 63PPowyed 5exsysveVl (hroN3:N 8) (Col: 1anmmmAi									
v u 11L05867L56	VEoECDocs	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LQ0.1	Dg/b	<LQ0.1	<LQ0.1	LQ0	No bnDry
v u 11L058+7LL8	Gh 10	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LQ0.1	Dg/b	<LQ0.1	<LQ0.1	LQ0	No bnDry
E2 0Q0F: 63PPowyed 5exsysveVl (hroN3:N 8) (Col: 1anmmmli									
v u 11L058+7L19	Gh 0L	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LQ0.1	Dg/b	<LQ0.1	<LQ0.1	LQ0	No bnDry
v u 11L058+7L58	WPbJT0	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LQ0.1	Dg/b	<LQ0.1	<LQ0.1	LQ0	No bnDry
EK0AQ2 : Free f 9sV3dle G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQmi									
v u 11L019L7LL3	VEoECDocs	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
v u 11L058+7LL1	Gh 6	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	LQ0L3	LQ0L0	LQ0	No bnDry
EK0AQ2 : Free f 9sV3dle G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQDi									
v u 11L058+7L15	Gh 55	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
v u 11L058+7L51	Gh 05M	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	LQ0.16	LQ0.1p	550B	No bnDry
EK0AQ2 : Free f 9sV3dle G9 63Pf rele t Vsv9Per 8) (Col: 1anman0i									
v u 11L058+7L63	MUP0	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	LQ0.1+	LQ0.1p	LQ0	No bnDry
v u 11L06L67LL8	VEoECDocs	v KL53G: Ftee i CaEn e	7777	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
EK0An2 : Solsv(9sV3dle B9 63Pf rele t Vsv9Per 8) (Col: 1anmanli									
v u 11L058+7LL1	Gh 6	v KL5+G: Toyal i CaEn e	3p71573	LQ0L0	Dg/b	LQ0pL	LQ0+9	LQ0	L% 73L%
v u 11L058+7L1L	Gh 1+	v KL5+G: Toyal i CaEn e	3p71573	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
EK0An2 : Solsv(9sV3dle B9 63Pf rele t Vsv9Per 8) (Col: 1anmanAi									
v u 11L058+7L51	Gh 05M	v KL5+G: Toyal i CaEn e	3p71573	LQ0L0	Dg/b	LQ060	LQ085	1L0B	L% 75L%
v u 11L058+7L61	AJNWTv70	v KL5+G: Toyal i CaEn e	3p71573	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
EK0Am2 : Wesk t f3tl 63PPof 3sGve (9sV3dle B9 63Pf rele t Vsv9Per 8) (Col: 1anmanl i									
v u 11L058+7LL1	Gh 6	v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQ0L0	Dg/b	LQ0L9	LQ0L9	LQ0	No bnDry
v u 11L058+7L1L	Gh 1+	v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry
EK0Am2 : Wesk t f3tl 63PPof 3sGve (9sV3dle B9 63Pf rele t Vsv9Per 8) (Col: 1anman4i									
v u 11L058+7L51	Gh 05M	v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQ0L0	Dg/b	LQ0.00	LQ0.33	51C	L% 73L%
v u 11L058+7L61	AJNWTv70	v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQ0L0	Dg/b	<LQ0L0	<LQ0L0	LQ0	No bnDry

Wcr 7u ay tnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4nDi									
v u 11L05L97LL1	VEoECDocs	v KL0LP: FIcotn e	1+98070878	LO	Dg/b	LO5	LO5	LQ1	No bnDry
v u 11L05867L56	VEoECDocs	v KL0LP: FIcotn e	1+98070878	LO	Dg/b	<LO	<LO	LQ1	No bnDry
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4ali									
v u 11L058+7LL9	Gh 13	v KL0LP: FIcotn e	1+98070878	LO	Dg/b	<LO	<LO	LQ1	No bnDry
v u 11L058+7L18	Gh 69	v KL0LP: FIcotn e	1+98070878	LO	Dg/b	1Q1	1Q1	LQ1	L% 73L%
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4aQi									
v u 11L058+7L60	Gh 19	v KL0LP: FIcotn e	1+98070878	LO	Dg/b	LO-	LO-	LQ1	No bnDry
EK0Qa2 : R3r3e sP R G9 63Pf rele t Vsv9Per 8) (Col: 1an4A41i									
v u 11L05097LL1	VEoECDocs	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	LQ80	LQ83	LQ1	L% 75L%
v u 11L058L7LL1	VEoECDocs	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
EK0Qa2 : R3r3e sP R G9 63Pf rele t Vsv9Per 8) (Col: 1an4A4ai									
v u 11L058+7LL1	Gh 6	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
v u 11L058+7L1L	Gh 1+	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
EK0Qa2 : R3r3e sP R G9 63Pf rele t Vsv9Per 8) (Col: 1an4AQAi									
v u 11L058+7L51	Gh 05M	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	LQ5	LQ5	LQ1	No bnDry
v u 11L06L57LL+	VEoECDocs	v KL3pG: Nnytnye as N	7777	LQ1	Dg/b	LO+	LO+	LQ1	L% 75L%
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 63Pf rele t Vsv9Per 8) (Col: 1anDmmni									
v u 11L050+7LL1	VEoECDocs	v KL39G: Nnytnye w Nnytaye as N	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
v u 11L058+7LL9	Gh 13	v KL39G: Nnytnye w Nnytaye as N	7777	LQ1	Dg/b	LQ+	LQp	1+Q	No bnDry
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 63Pf rele t Vsv9Per 8) (Col: 1anDmmni									
v u 11L058+7L5L	Gh 01	v KL39G: Nnytnye w Nnytaye as N	7777	LQ1	Dg/b	LQ9	LOL	LQ1	L% 73L%
v u 11L058+7L60	Gh 19	v KL39G: Nnytnye w Nnytaye as N	7777	LQ1	Dg/b	LO+	LOp	LQ1	L% 73L%
EK0a12 : Hesfl3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4A4ni									
v u 11L058+7LL1	Gh 6	v KLp1G: AeaRynne Pdos4dotcs as P	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
v u 11L058+7L1L	Gh 1+	v KLp1G: AeaRynne Pdos4dotcs as P	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
EK0a12 : Hesfl3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4AQ1i									
v u 11L058+7L51	Gh 05M	v KLp1G: AeaRynne Pdos4dotcs as P	7777	LQ1	Dg/b	<LQ1	<LQ1	LQ1	No bnDry
v u 11L06L57LL+	VEoECDocs	v KLp1G: AeaRynne Pdos4dotcs as P	7777	LQ1	Dg/b	3Q8	3Q8	LQ1	L% 75L%
EK0mQM: pcv3de sP pAu 8) (Col: 1an4QA1i									
v u 11L05197LL5	VEoECDocs	v KL83: WclfIn e as W57	1809+75378	LO	Dg/b	<LO	<LO	LQ1	No bnDry
v u 11L058+7LLp	Gh 16	v KL83: WclfIn e as W57	1809+75378	LO	Dg/b	<LO	<LO	LQ1	No bnDry
EK0mQM: pcv3de sP pAu 8) (Col: 1an4QAAi									
v u 11L058+7L18	Gh 69	v KL83: WclfIn e as W57	1809+75378	LO	Dg/b	<LO	<LO	LQ1	No bnDry
v u 11L058+7L5p	WPbJT6	v KL83: WclfIn e as W57	1809+75378	LO	Dg/b	<LO	<LO	LQ1	No bnDry
Eb0a4t : MoVof 9f v8f t roN sl3f 59drof srGoVP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: WyQteEe	1LL70573	3	µg/b	<3	<3	LQ1	No bnDry
		v PLp0: Jso4to4QIr eE@Ee	9878578	3	µg/b	<3	<3	LQ1	No bnDry
		v PLp0: E7Pto4QIr eE@Ee	1L67+371	3	µg/b	<3	<3	LQ1	No bnDry

Wcr 7u ay tnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Eb0a4t : MoVof 9f v8f t roN sl3f 59drof srGoVP 8) (Col: 1anD1D1i uf oVl3Vced									
v u 11L058+7LLp	Gh 16	v PLp0: 1@G37TtnDeydCr eE@Ee	1L87+p78	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: seR7XcyCr eE@Ee	1637987 8	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@5O07TtnDeydCr eE@Ee	937+67+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: yety7XcyCr eE@Ee	987L+7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 47so4to4CyolceEe	9978p7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7XcyCr eE@Ee	1L07317 8	3	µg/b	<3	<3	L0.	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: WyCteEe	1LL70573	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: Jso4to4Cr eE@Ee	9878578	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7Pto4Cr eE@Ee	1L67+371	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@G37TtnDeydCr eE@Ee	1L87+p78	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: seR7XcyCr eE@Ee	1637987 8	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@5O07TtnDeydCr eE@Ee	937+67+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: yety7XcyCr eE@Ee	987L+7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 47so4to4CyolceEe	9978p7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7XcyCr eE@Ee	1L07317 8	3	µg/b	<3	<3	L0.	No bnDry
Eb0a4t : MoVof 9f v8f t roN sl3f 59drof srGoVP 8) (Col: 1anD1DQ									
v u 11L058+7L51	Gh 05M	v PLp0: WyCteEe	1LL70573	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: Jso4to4Cr eE@Ee	9878578	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7Pto4Cr eE@Ee	1L67+371	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@G37TtnDeydCr eE@Ee	1L87+p78	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: seR7XcyCr eE@Ee	1637987 8	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@5O07TtnDeydCr eE@Ee	937+67+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: yety7XcyCr eE@Ee	987L+7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 47so4to4CyolceEe	9978p7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7XcyCr eE@Ee	1L07317 8	3	µg/b	<3	<3	L0.	No bnDry
v u 11L058+7L61	AJNWTv70	v PLp0: WyCteEe	1LL70573	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: Jso4to4Cr eE@Ee	9878578	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7Pto4Cr eE@Ee	1L67+371	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@G37TtnDeydCr eE@Ee	1L87+p78	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: seR7XcyCr eE@Ee	1637987 8	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 1@5O07TtnDeydCr eE@Ee	937+67+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: yety7XcyCr eE@Ee	987L+7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: 47so4to4CyolceEe	9978p7+	3	µg/b	<3	<3	L0.	No bnDry
		v PLp0: E7XcyCr eE@Ee	1L07317 8	3	µg/b	<3	<3	L0.	No bnDry
Eb0a4B: Ox9geVsled (oN 7ocVdP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: I nEC VReyaye	1L87L370	3L	µg/b	<3L	<3L	L0.	No bnDry
		v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	<3L	L0.	No bnDry
		v PLp0: 07u eydC7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	<3L	L0.	No bnDry
		v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	<3L	L0.	No bnDry

Wcr 7u ay tnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Eb0a4B: Ox9geVsled (oN 7ocVdP 8) (Col: 1anD1D1i uf oVl3Vced									
v u 11L058+7L11	Gh 51	v PLp0: I mEO VReyaye	1L87L370	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 07u eydO7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	<3L	L01	No bnDry
Eb0a4B: Ox9geVsled (oN 7ocVdP 8) (Col: 1anD1DQl									
v u 11L058+7L51	Gh 05M	v PLp0: I mEO VReyaye	1L87L370	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 07u eydO7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	<3L	L01	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: I mEO VReyaye	1L87L370	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 07u eydO7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	<3L	L01	No bnDry
Eb0a4(: pcv-oVsled (oN 7ocVdP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: i atr oE . nsclfn e	p37137L	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: i atr oE . nsclfn e	p37137L	3	µg/b	<3	<3	L01	No bnDry
Eb0a4(: pcv-oVsled (oN 7ocVdP 8) (Col: 1anD1DQl									
v u 11L058+7L51	Gh 05M	v PLp0: i atr oE . nsclfn e	p37137L	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: i atr oE . nsclfn e	p37137L	3	µg/b	<3	<3	L01	No bnDry
Eb0a46 : FcN 3gsVIP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: 5O57MnRdloto4to4aEe	39075L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnRdloto4to4aEe	p878p73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71O57MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71O57MnRdloto4to4OeEe	1LL+17L57+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnrtoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: 5O57MnRdloto4to4aEe	39075L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnRdloto4to4aEe	p878p73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71O57MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71O57MnRdloto4to4OeEe	1LL+17L57+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnrtoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	<3	L01	No bnDry
Eb0a46 : FcN 3gsVIP 8) (Col: 1anD1DQl									
v u 11L058+7L51	Gh 05M	v PLp0: 5O57MnRdloto4to4aEe	39075L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnRdloto4to4aEe	p878p73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71O57MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71O57MnRdloto4to4OeEe	1LL+17L57+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnrtoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: 5O57MnRdloto4to4aEe	39075L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1O57MnRdloto4to4aEe	p878p73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71O57MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	<3	L01	No bnDry

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Eb0a46 : FcN 3gsVIP 8) (Col: 1anD1DQl uf oVl3Vced									
v u 11L058+7L61	AJNWTv 70	v PLp0: ytaEs71G7MnRdloto4to4QeEe	1LL+17L57+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G57MnntoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	<3	LQ1.	No bnDry
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: 1G7MnRdloteydeEe	p376370	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: Jo. oDeydaEe	p078870	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: ytaEs71G57MnRdloteydeEe	13+7+L73	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G7MnRdloteydaEe	p376076	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: Rns71G57MnRdloteydeEe	13+73975	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1GG7TtnRdloteydaEe	p17337+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G7MnRdloto4to4QeEe	3+67387+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: i atr oE TeytaRdlotn e	3+75673	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G57MnRdloteydaEe	1Lp7L+75	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: TtnRdloteydeEe	p97L17+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: MnntoDoDeydaEe	p079376	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1GG57TtnRdloteydaEe	p97LL73	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G57MnRdloto4to4aEe	1057589	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1GGG57TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: ytaEs71G7MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: Rns71G7MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1GG57TeytaRdlotoeydaEe	p976073	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G57TtnRdloto4to4aEe	9+71870	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G57MnntoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: HexaRdlotor cya. reEe	8p7+876	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: MnRdloto. nIcotoDeydaEe	p37p178	3L	µg/b	<3L	<3L	LQ1.	No bnDry
		v PLp0: i dlotoDeydaEe	p078p76	3L	µg/b	<3L	<3L	LQ1.	No bnDry
		v PLp0: I nEG Rdlotn e	p37L170	3L	µg/b	<3L	<3L	LQ1.	No bnDry
		v PLp0: XtoDoDeydaEe	p078679	3L	µg/b	<3L	<3L	LQ1.	No bnDry
		v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	<3L	LQ1.	No bnDry
		v PLp0: TtnRdlotofIcotoDeydaEe	p37+970	3L	µg/b	<3L	<3L	LQ1.	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: 1G7MnRdloteydeEe	p376370	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: Jo. oDeydaEe	p078870	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: ytaEs71G57MnRdloteydeEe	13+7+L73	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G7MnRdloteydaEe	p376076	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: Rns71G57MnRdloteydeEe	13+73975	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1GG7TtnRdloteydaEe	p17337+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: 1G7MnRdloto4to4QeEe	3+67387+	3	µg/b	<3	<3	LQ1.	No bnDry
		v PLp0: i atr oE TeytaRdlotn e	3+75673	3	µg/b	<3	<3	LQ1.	No bnDry

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 9) (Col: 1anD1D1i uf oVl3Vced									
v u 11L058+7L11	Gh 51	v PLp0: 1057MnRdlotoeydaEe	1Lp7L+75	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TtnRdlotoeydeEe	p97L17+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnrtoDoDeydaEe	p079376	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010577TtnRdlotoeydaEe	p97LL73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdloto4to4aEe	1057587 9	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010105 7TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71007MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71007MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010557TeytaRdlotoeydaEe	p976073	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057TtnRdloto4to4aEe	9+71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnrtoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: HexaRdlotor cya. reEe	8p7+876	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnRdloto. nlcotoDeydaEe	p37p178	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoDeydaEe	p078p76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: I nEC Rdlotn e	p37L170	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: XtoDoDeydaEe	p078679	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: TtnRdlotoflcotoDeydaEe	p37+970	3L	µg/b	<3L	<3L	L01	No bnDry
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 9) (Col: 1anD1DCl									
v u 11L058+7L51	Gh 05M	v PLp0: 1057MnRdlotoeydeEe	p376370	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Jb. oDeydaEe	p078870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71057MnRdlotoeydeEe	13+7+L73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotoeydaEe	p376076	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71057MnRdlotoeydeEe	13+73975	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010577TtnRdlotoeydaEe	p17337+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdloto4to4CeEe	3+67387+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: i atr oE TeytaRdlotn e	3+75673	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotoeydaEe	1Lp7L+75	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TtnRdlotoeydeEe	p97L17+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnrtoDoDeydaEe	p079376	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010577TtnRdlotoeydaEe	p97LL73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdloto4to4aEe	1057587 9	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010105 7TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71007MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rns71007MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1010557TeytaRdlotoeydaEe	p976073	3	µg/b	<3	<3	L01	No bnDry

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1DQi uf oVl3Vced									
v u 11L058+7L51	Gh 05M	v PLp0: 1056G7TtnRdloto4to4aEe	9+71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnrtoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: HexaRdlotor cya. reEe	8p7+876	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnRdloto. nlcotoD eydaEe	p37p178	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoD eydaEe	p078p76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: I nEG Rdlotn e	p37L170	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: XtoD oD eydaEe	p078679	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: TtnRdlotoflcotoD eydaEe	p37+970	3L	µg/b	<3L	<3L	L01	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: 1057MnRdlotoeydeEe	p376370	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Jb. oD eydaEe	p078870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71057MnRdlotoeydeEe	13+7+L73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotoeydaEe	p376076	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rts71057MnRdlotoeydeEe	13+73975	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057TtnRdlotoeydaEe	p17337+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdloto4to4OeEe	3+67387+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: i atr oE TeytaRdlotn e	3+75673	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotoeydaEe	1Lp7L+75	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TtnRdlotoeydeEe	p97L17+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnrtoD oD eydaEe	p079376	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1056G7TtnRdlotoeydaEe	p97LL73	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdloto4to4aEe	1057587 9	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1056G57TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: ytaEs71057MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: Rts71057MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1056G57TeytaRdlotoeydaEe	p976073	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1056G7TtnRdloto4to4aEe	9+71870	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnrtoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: HexaRdlotor cya. reEe	8p7+876	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: MnRdloto. nlcotoD eydaEe	p37p178	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoD eydaEe	p078p76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: I nEG Rdlotn e	p37L170	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: XtoD oD eydaEe	p078679	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	<3L	L01	No bnDry
		v PLp0: TtnRdlotoflcotoD eydaEe	p37+970	3L	µg/b	<3L	<3L	L01	No bnDry
Eb0a4F: 5svogeVsled t roNsl3f (oN 7ocVdP 8) (Col: 1anD1D1i									

Wcr 7u ay:nx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Eb0a4F: 5svogeVsled t roNsl3 (oN 7ocVdP 8) (Col: 1anD1D1i uf oVl3Vced									
v u 11L058+7LLp	Gh 16	v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 57 dlotoyolceEe	9370978	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 07 dlotoyolceEe	1L+70670	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1067MnRdlotor eE@Ee	3017p671	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1007MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotor eE@Ee	9373L71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 15007TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1506TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 57 dlotoyolceEe	9370978	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 07 dlotoyolceEe	1L+70670	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1067MnRdlotor eE@Ee	3017p671	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1007MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotor eE@Ee	9373L71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 15007TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1506TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	<3	L01	No bnDry
Eb0a4F: 5svogeVsled t roNsl3 (oN 7ocVdP 8) (Col: 1anD1DQi									
v u 11L058+7L51	Gh 05M	v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	8	8	L01	No bnDry
		v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 57 dlotoyolceEe	9370978	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 07 dlotoyolceEe	1L+70670	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1067MnRdlotor eE@Ee	3017p671	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1007MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotor eE@Ee	9373L71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 15007TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1506TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	<3	L01	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 57 dlotoyolceEe	9370978	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 07 dlotoyolceEe	1L+70670	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1067MnRdlotor eE@Ee	3017p671	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1007MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1057MnRdlotor eE@Ee	9373L71	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 15007TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	<3	L01	No bnDry
		v PLp0: 1506TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	<3	L01	No bnDry
Eb0a42 : Sr3hsvoNelhsVeP 8) (Col: 1anD1D1i									
v u 11L058+7LLp	Gh 16	v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	<3	L01	No bnDry

Wcr 7u ay tnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Eb0a42 : Sr3hsvoNelhsVeP 8) (Col: 1anD1Di i ufoVl3Vced									
v u 11L058+7LLp	Gh 16	v PLp0: XtoDo. mRdlotoDeydaEe	p375p70	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: Mnr toDoRdlotoDeydaEe	1507087l	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDofotD	p375375	3	µg/b	<3	<3	LQ.	No bnDry
v u 11L058+7L11	Gh 51	v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDo. mRdlotoDeydaEe	p375p70	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: Mnr toDoRdlotoDeydaEe	1507087l	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDofotD	p375375	3	µg/b	<3	<3	LQ.	No bnDry
Eb0a42 : Sr3hsvoNelhsVeP 8) (Col: 1anD1DQi									
v u 11L058+7L51	Gh 05M	v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDo. mRdlotoDeydaEe	p375p70	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: Mnr toDoRdlotoDeydaEe	1507087l	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDofotD	p375375	3	µg/b	<3	<3	LQ.	No bnDry
v u 11L058+7L61	AJNWTv 70	v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDo. mRdlotoDeydaEe	p375p70	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: Mnr toDoRdlotoDeydaEe	1507087l	3	µg/b	<3	<3	LQ.	No bnDry
		v PLp0: XtoDofotD	p375375	3	µg/b	<3	<3	LQ.	No bnDry
Eb0aQ8pLMiB: bov8Vcf vesr t roNsl3f 59drof srGoVP 8) (Col: 1anl QaQi									
v u 11L058+7L51	Gh 05M	v PLp3(Wu): XeE@(a)4QeEe	3L76578	LQ3	µg/b	<LQ3	<LQ3	LQ.	No bnDry
		v PLp3(Wu): Na4dydaleEe	9175L76	1Q.	µg/b	516	56G	1LQ0	L% 75L%
		v PLp3(Wu): VReEa4dydQeEe	5L879+78	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): VReEa4dydeEe	8676579	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): FlcoteEe	8+7p67p	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): PdeEaEydteEe	837L178	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): VEydtaReEe	15L7157p	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): FlcotaEydeEe	5L+7007L	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): PQeEe	1597LL7L	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): XeE@a)aEydtaReEe	3+73376	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): i dtQseEe	5187L179	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): XeE@(r)flcotaEydeEe	5L379975	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): XeE@(k)flcotaEydeEe	5Lp7L879	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): JE. eEo(1Q5GGR)4QeEe	1967697 3	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): MnreE@aQ)aEydtaReEe	367pL76	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
		v PLp3(Wu): XeE@(gQQ)4etQeEe	1917 5075	1Q.	µg/b	<1Q.	<1Q.	LQ.	No bnDry
Eb0m0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anl Qa4i									
v u 11L058+7L51	Gh 05M	v PLp1: i 13 7i 58 FtaRymE	7777	1LL	µg/b	13+L	190L	51G	L% 73L%
		v PLp1: i 1L 7i 10 FtaRymE	7777	3L	µg/b	59+L	6L8L	6G	L% 75L%
		v PLp1: i 59 7i 6+ FtaRymE	7777	3L	µg/b	5LL	6LL	0LG	No bnDry
Eb0m0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anD1DAi									
v u 11L058+7LLp	Gh 16	v PL8L: i + 7i 9 FtaRymE	7777	5L	µg/b	<5L	<5L	LQ.	No bnDry

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
Eb0m0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anD1DAi uf oVI3/ced									
v u 11L058+7L11	Gh 51	v PL8L: i + 7i 9 FtaRyroE	7777	5L	µg/b	<5L	<5L	LQ1	No bnDry
Eb0m0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anD1D4i									
v u 11L058+7L51	Gh 05M	v PL8L: i + 7i 9 FtaRyroE	7777	5L	µg/b	0pL	03L	60	L% 75L%
v u 11L058+7L61	AJNWTv 70	v PL8L: i + 7i 9 FtaRyroE	7777	5L	µg/b	<5L	<5L	LQ1	No bnDry
Eb0m0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anI Qa4i									
v u 11L058+7L51	Gh 05M	v PLp1: >i 1L 7i 1+ FtaRyroE	7777	1LL	µg/b	1p3L	185L	001	L% 73L%
		v PLp1: >i 1+ 7i 60 FtaRyroE	7777	1LL	µg/b	101L	183L	5+09	L% 73L%
		v PLp1: >i 60 7i 0L FtaRyroE	7777	1LL	µg/b	11L	19L	3003	No bnDry
Eb0m0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anD1DAi									
v u 11L058+7LLp	Gh 16	v PL8L: i + 7i 1L FtaRyroE	7777	5L	µg/b	<5L	<5L	LQ1	No bnDry
v u 11L058+7L11	Gh 51	v PL8L: i + 7i 1L FtaRyroE	7777	5L	µg/b	<5L	<5L	LQ1	No bnDry
Eb0m0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anD1D4i									
v u 11L058+7L51	Gh 05M	v PL8L: i + 7i 1L FtaRyroE	7777	5L	µg/b	08L	0+L	05	L% 75L%
v u 11L058+7L61	AJNWTv 70	v PL8L: i + 7i 1L FtaRyroE	7777	5L	µg/b	<5L	<5L	LQ1	No bnDry
Eb0m0: BSEXR 8) (Col: 1anD1DAi									
v u 11L058+7LLp	Gh 16	v PL8L: XeE@Ee	p170675	1	µg/b	<1	<1	LQ1	No bnDry
		v PL8L: TolceEe	1L878876	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: v ydCr eE@Ee	1LL70170	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: Deya7& 4ata72CeEe	1L876876 1L+70576	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: otydo72CeEe	9370p7+	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: Na4dydaleEe	9175L76	3	µg/b	<3	<3	LQ1	No bnDry
v u 11L058+7L11	Gh 51	v PL8L: XeE@Ee	p170675	1	µg/b	<1	<1	LQ1	No bnDry
		v PL8L: TolceEe	1L878876	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: v ydCr eE@Ee	1LL70170	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: Deya7& 4ata72CeEe	1L876876 1L+70576	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: otydo72CeEe	9370p7+	5	µg/b	<5	<5	LQ1	No bnDry
		v PL8L: Na4dydaleEe	9175L76	3	µg/b	<3	<3	LQ1	No bnDry
Eb0m0: BSEXR 8) (Col: 1anD1D4i									
v u 11L058+7L51	Gh 05M	v PL8L: XeE@Ee	p170675	1	µg/b	633	60+	5G+	L% 75L%
		v PL8L: TolceEe	1L878876	5	µg/b	+1	39	5G8	L% 75L%
		v PL8L: v ydCr eE@Ee	1LL70170	5	µg/b	6	6	LQ1	No bnDry
		v PL8L: Deya7& 4ata72CeEe	1L876876 1L+70576	5	µg/b	11	1L	LQ1	No bnDry
		v PL8L: otydo72CeEe	9370p7+	5	µg/b	9	9	LQ1	No bnDry
		v PL8L: Na4dydaleEe	9175L76	3	µg/b	66	0L	190	No bnDry
v u 11L058+7L61	AJNWTv 70	v PL8L: XeE@Ee	p170675	1	µg/b	<1	<1	LQ1	No bnDry
		v PL8L: TolceEe	1L878876	5	µg/b	<5	<5	LQ1	No bnDry

Wcr 7u aytnx: **Wt SEH**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
Eb0m0: BSEXR 8j (Col: 1anD1D4i uf oVl3Vced									
v u 11L058+7L61	AJNWTv 70	v PL8L: v ydCr eE@eEe	1LL7017 0	5	µg/b	<5	<5	L01.	No bnD ry
		v PL8L: D eya7& 4ata72 CeEe	1L876876 1L+70576	5	µg/b	<5	<5	L01.	No bnD ry
		v PL8L: otydo72 CeEe	9370p7+	5	µg/b	<5	<5	L01.	No bnD ry
		v PL8L: Na4dydaleEe	9175L76	3	µg/b	<3	<3	L01.	No bnD ry

Method Blank (MB) and Laboratory Control Spike (LCS) Report

Tde qcalnyC RoEytol yetD u eydo. / bar otayotC XlaEk tefets yo aE aEalOye ftee Daytnx yo z drnRd all teageEys ate a. . e. nE yde saDe molcDes ot 4to4otymoEs as cse. nE syaE. at. saD4le 4te4atayrnoEO Tde 4ct4ose of ydns Qi 4ataDeyet ns yo DoEnyot 4oyeEyral lar otayotC RoEyaDnEaymoEO Tde qcalnyC RoEytol yetD bar otayotC i oEytol WaD4le (bi W) tefets yo a Retyfne. tefeteERe Dayetnal, ot a kEoz E nEyetfeteERe ftee Daytnx s4nke. z nyd yatgey aEalOyesOTde 4ct4ose of ydns Qi 4ataDeyet ns yo DoEnyot Deydo. 4teRsrnoE aE. aRRctaRCnE. e4eE. eEyof saD4le DaytnxOMCEaDnRAeRometCbnDns ate r ase. oE syaysyRal emalcaymoE of 4toResse. bi WO

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Et 01Q: Solsv63PPowyed povBlP 8) (Col: 1anl n0mi								
v VL13H: Toyal Mnssolme. Wolns j 18L°i	GJW751L7L1L	3	Dg/b	<3	5LLL Dg/b	990	98	1L0
Et 01Q: Solsv63PPowyed povBlP 8) (Col: 1anQa0ni								
v VL13H: Toyal Mnssolme. Wolns j 18L°i	GJW751L7L1L	3	Dg/b	<3	5LLL Dg/b	980	98	1L0
Et 01Q: Solsv63PPowyed povBlP 8) (Col: 1anQa0ai								
v VL13H: Toyal Mnssolme. Wolns j 18L°i	GJW751L7L1L	3	Dg/b	<3	5LLL Dg/b	1L1	98	1L0
E60l ab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4a1i								
v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	7777	5LL Dg/b	953	pp	15p
E60l ab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4aAi								
v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	7777	5LL Dg/b	910	pp	15p
E60l ab: t vksv8V39 G9 b(S3rslor 8) (Col: 1anQ4a4i								
v ML6p7P: Toyal VlkalnEnyCas i ai B6	7777	1	Dg/b	7777	5LL Dg/b	955	pp	15p
E60412 : pcv-sle 8ScrG3d3N elr3f i sP pO4 AuG9 6t 8) (Col: 1an4A4Qi								
v ML01G: Wclfaye as WB0 7Tctr n nDeytnR	108L87p978	1	Dg/b	<1	153 Dg/b	1L8	81	153
E60412 : pcv-sle 8ScrG3d3N elr3f i sP pO4 AuG9 6t 8) (Col: 1an4AQDi								
v ML01G: Wclfaye as WB0 7Tctr n nDeytnR	108L87p978	1	Dg/b	<1	153 Dg/b	980	81	153
E6042 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4A44i								
v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	<1	1LLL Dg/b	115	89	11p
E6042 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4A4Di								
v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	<1	1LLL Dg/b	993	89	11p
E6042 : (hvor3de 63Pf rele sVsv9Per 8) (Col: 1an4AQ4i								
v ML03G: i dlotn e	1+88p7LL7+	1	Dg/b	<1	1LLL Dg/b	980	89	11p
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4A4l i								
v ML96F: i alRrcD	p00L7pL75	1	Dg/b	<1	3 Dg/b	1L1	81	159
v ML96F: u agEesrcD	p0697937O	1	Dg/b	<1	3 Dg/b	1L5	8L	15L
v ML96F: Wo. rcD	p00L75673	1	Dg/b	<1	3L Dg/b	1L3	p8	150
v ML96F: PoyassrcD	p00L7L97p	1	Dg/b	<1	3L Dg/b	980	p9	151
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4A4mi								
v ML96F: i alRrcD	p00L7pL75	1	Dg/b	<1	3 Dg/b	9+03	81	159
v ML96F: u agEesrcD	p0697937O	1	Dg/b	<1	3 Dg/b	935	8L	15L
v ML96F: Wo. rcD	p00L75673	1	Dg/b	<1	3L Dg/b	9LO	p8	150
v ML96F: PoyassrcD	p00L7L97p	1	Dg/b	<1	3L Dg/b	910	p9	151
E60DI F: 63PPowyed Msjor (sl3bVP 8) (Col: 1an4AQi i								

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
E6 0DI F: 6 3PPowed Msjor (slSvVP 8) (Col: 1an4AQi i uf oVI3Vced								
v ML96F: i alRrcD	p00L7pL75	1	Dg/b	<1	3 Dg/b	115	81	159
v ML96F: u agEesrcD	p0697937O	1	Dg/b	<1	3 Dg/b	95G6	8L	15L
v ML96F: Wb. rcD	p00L75673	1	Dg/b	<1	3L Dg/b	9pO+	p8	150
v ML96F: Poyassrc D	p00L7L97p	1	Dg/b	<1	3L Dg/b	9pG3	p9	151
E2 0A0F: 6 3PPowed MelsvP G9 l(buMp 8) (Col: 1an4Dm0i								
v GL5LV7F: VlcDrErcD	p05979L73	LQ1	Dg/b	<LQ1	LG3 Dg/b	1L5	8L	15L
v GL5LV7F: VtseErR	p00L76875	LQL1	Dg/b	<LQL1	LG Dg/b	1L+	8p	1L9
v GL5LV7F: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	LG Dg/b	1L0	88	11L
v GL5LV7F: i or aly	p00L70870	LQL1	Dg/b	<LQL1	LG Dg/b	1L+	8p	111
v GL5LV7F: i o44et	p00L73L78	LQL1	Dg/b	<LQL1	LG Dg/b	1LL	8+	1L8
v GL5LV7F: bea.	p0697957I	LQL1	Dg/b	<LQL1	LG Dg/b	1L3	9L	11L
v GL5LV7F: u aEgaEese	p06979+73	LQL1	Dg/b	<LQL1	LG Dg/b	9+G5	8p	111
v GL5LV7F: NnRkel	p00L7L57L	LQL1	Dg/b	<LQL1	LG Dg/b	1Lp	8+	115
v GL5LV7F: WeleErcD	pp8570975	LQ1	Dg/b	<LQ1	LG Dg/b	980Q	86	111
v GL5LV7F: ZnER	p00L7++7+	LQL3	Dg/b	<LQL3	LG Dg/b	1L6	8+	15L
v GL5LV7F: XotoE	p00L70578	LQ3	Dg/b	<LQ3	LG Dg/b	9+0Q	+1	166
v GL5LV7F: JtoE	p0697897+	LQ3	Dg/b	<LQ3	LG3 Dg/b	1L5	p9	119
E2 0A0F: 6 3PPowed MelsvP G9 l(buMp 8) (Col: 1an4DmAi								
v GL5LV7F: VlcDrErcD	p05979L73	LQ1	Dg/b	<LQ1	LG3 Dg/b	1L6	8L	15L
v GL5LV7F: VtseErR	p00L76875	LQL1	Dg/b	<LQL1	LG Dg/b	1L9	8p	1L9
v GL5LV7F: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	LG Dg/b	1L+	88	11L
v GL5LV7F: i or aly	p00L70870	LQL1	Dg/b	<LQL1	LG Dg/b	1L+	8p	111
v GL5LV7F: i o44et	p00L73L78	LQL1	Dg/b	<LQL1	LG Dg/b	1Lp	8+	1L8
v GL5LV7F: bea.	p0697957I	LQL1	Dg/b	<LQL1	LG Dg/b	1Lp	9L	11L
v GL5LV7F: u aEgaEese	p06979+73	LQL1	Dg/b	<LQL1	LG Dg/b	93G8	8p	111
v GL5LV7F: NnRkel	p00L7L57L	LQL1	Dg/b	<LQL1	LG Dg/b	11L	8+	115
v GL5LV7F: WeleErcD	pp8570975	LQ1	Dg/b	<LQ1	LG Dg/b	9+G6	86	111
v GL5LV7F: ZnER	p00L7++7+	LQL3	Dg/b	<LQL3	LG Dg/b	1L0	8+	15L
v GL5LV7F: XotoE	p00L70578	LQ3	Dg/b	<LQ3	LG Dg/b	96G3	+1	166
v GL5LV7F: JtoE	p0697897+	LQ3	Dg/b	<LQ3	LG3 Dg/b	98G1	p9	119
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi								
v GL5LV7T: VlcDrErcD	p05979L73	LQ1	Dg/b	<LQ1	LG3 Dg/b	1L+	83	156
v GL5LV7T: VtseErR	p00L76875	LQL1	Dg/b	<LQL1	LG Dg/b	1L5	8+	11L
v GL5LV7T: i a. DrcD	p00L70679	LQLL1	Dg/b	<LQLL1	LG Dg/b	1L5	8p	111
v GL5LV7T: i or aly	p00L70870	LQL1	Dg/b	<LQL1	LG Dg/b	1L3	88	110
v GL5LV7T: i o44et	p00L73L78	LQL1	Dg/b	<LQL1	LG Dg/b	1L+	88	11L
v GL5LV7T: bea.	p0697957I	LQL1	Dg/b	<LQL1	LG Dg/b	98G0	9L	110
v GL5LV7T: u aEgaEese	p06979+73	LQL1	Dg/b	<LQL1	LG Dg/b	1LL	8p	116
v GL5LV7T: NnRkel	p00L7L57L	LQL1	Dg/b	<LQL1	LG Dg/b	1L3	89	116

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi uf oVl3Vced								
v GL5LV7T: WeleEncD	pp8570975	LQ1	Dg/b	<LQ1	LQ1 Dg/b	90C3	81	1L9
v GL5LV7T: ZnER	p00L7++7+	LQL3	Dg/b	<LQL3	LQ1 Dg/b	1L6	85	11+
v GL5LV7T: XotoE	p00L70578	LQ3	Dg/b	<LQ3	LQ1 Dg/b	9pC3	+0	160
v GL5LV7T: JtoE	p0697897+	LQ3	Dg/b	<LQ3	LQ3 Dg/b	1L1	81	153
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4DaDi								
v GL63F: u etRctC	p06979p7+	LQLL1	Dg/b	<LQLL1	LQ1LL Dg/b	111	p1	153
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4Dm1i								
v GL63F: u etRctC	p06979p7+	LQLL1	Dg/b	<LQLL1	LQ1LL Dg/b	1L+	p1	153
E2 0l QS: SolsvHef oyersGve Merf cr9 G9 FLMp 8) (Col: 1aa0n11i								
v GL63T: u etRctC	p06979p7+	LQLL1	Dg/b	<LQLL1	LQ1LL Dg/b	1LL	+9	153
E2 0QDF: 63PPowyed 5exsysveVl (hroN3cN 8) (Col: 1anmmnAi								
v GL3LF: HexamaleEyi dtoDncD	1830L75979	LQ1	Dg/b	<LQ1	LQ3 Dg/b	1L+	8L	15L
E2 0QDF: 63PPowyed 5exsysveVl (hroN3cN 8) (Col: 1anmmn1i								
v GL3LF: HexamaleEyi dtoDncD	1830L75979	LQ1	Dg/b	<LQ1	LQ3 Dg/b	900L	8L	15L
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQni								
v KL53G: Ftee i CaEn e	7777	LQLL0	Dg/b	<LQLL0	LQ3 Dg/b	8+C5	p6	111
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQDi								
v KL53G: Ftee i CaEn e	7777	LQLL0	Dg/b	<LQLL0	LQ3 Dg/b	p+C8	p6	111
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anman0i								
v KL53G: Ftee i CaEn e	7777	LQLL0	Dg/b	<LQLL0	LQ3 Dg/b	86C6	p6	111
EK0An2: Solsv(9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anman1i								
v KL5+G: Toyal i CaEn e	3p71573	LQLL0	Dg/b	<LQLL0	LQ5 Dg/b	1Lp	83	153
EK0An2: Solsv(9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anmanAi								
v KL5+G: Toyal i CaEn e	3p71573	LQLL0	Dg/b	<LQLL0	LQ5 Dg/b	1L9	83	153
EK0Am2: Wesk t f 3d 63PPof 3sGve (9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anmanl i								
v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQLL0	Dg/b	<LQLL0	LQ3 Dg/b	83C8	+0	1L0
EK0Am2: Wesk t f 3d 63PPof 3sGve (9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anman4i								
v KL58G: h eak VRn MnssoRarle i CaEn e	7777	LQLL0	Dg/b	<LQLL0	LQ3 Dg/b	810L	+0	1L0
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4nDi								
v KL0LP: Flcotn e	1+98070878	LQ1	Dg/b	<LQ1	30L Dg/b	1L1	p8	15L
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4al i								
v KL0LP: Flcotn e	1+98070878	LQ1	Dg/b	<LQ1	30L Dg/b	99C+	p8	15L
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4aQi								
v KL0LP: Flcotn e	1+98070878	LQ1	Dg/b	<LQ1	30L Dg/b	99C+	p8	15L
EK0Qa2: R3r3e sP R G9 63Pf rele t Vsv9Per 8) (Col: 1an4A41i								
v KL3pG: Nnytne as N	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	8pQp	80	115

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0Qa2 : R3r3e sP R G9 6 3Pf rele t Vsv9Per 8) (Col: 1an4A4ai								
v KL3pG: Nnytne as N	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	9LQ	80	115
EK0Qa2 : R3r3e sP R G9 6 3Pf rele t Vsv9Per 8) (Col: 1an4AQAi								
v KL3pG: Nnytne as N	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	9LQ5	80	115
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 6 3Pf rele t Vsv9Per 8) (Col: 1anDmmi								
v KL39G: Nnytne w Nnytaye as N	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	91Q	p6	15p
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 6 3Pf rele t Vsv9Per 8) (Col: 1anDmmi								
v KL39G: Nnytne w Nnytaye as N	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	89Q	p6	15p
EK0a12 : Hesf l3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4A4ni								
v KLp1G: AeaRyme Pdos4dotcs as P	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	9pQ	80	1L8
EK0a12 : Hesf l3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4AQ1i								
v KLp1G: AeaRyme Pdos4dotcs as P	7777	LQ1	Dg/b	<LQ1	LQ3 Dg/b	91Q	80	1L8
EK0mQM: pcv3de sP pAu 8) (Col: 1an4QA1i								
v KL83: Wclfn e as W57	1809+75378	LQL	Dg/b	<LQ	LQ3 Dg/b	90Q	85	11+
EK0mQM: pcv3de sP pAu 8) (Col: 1an4QAAi								
v KL83: Wclfn e as W57	1809+75378	LQL	Dg/b	<LQ	LQ3 Dg/b	8+Q	85	11+
Eb0a4t : MoVof 9f v8f t roN sl3f 59drof srGoVP 8) (Col: 1anD1D1i								
v PLp0: WyQteEe	1LL70573	3	µg/b	<3	5L µg/b	91Q5	p0	155
v PLp0: Jso4to4Qr eE@Ee	9878578	3	µg/b	<3	5L µg/b	98Q	8L	15L
v PLp0: E7Pto4Qr eE@Ee	1L67+371	3	µg/b	<3	5L µg/b	98Qp	pL	15L
v PLp0: 1G3G7TtnDeydQr eE@Ee	1L87+p78	3	µg/b	<3	5L µg/b	98Q8	p1	119
v PLp0: seR7XcyQr eE@Ee	1637987 8	3	µg/b	<3	5L µg/b	1L1	p5	15L
v PLp0: 1G5Q7TtnDeydQr eE@Ee	937+67+	3	µg/b	<3	5L µg/b	1LL	p6	119
v PLp0: yety7XcyQr eE@Ee	987L+7+	3	µg/b	<3	5L µg/b	98Q	p6	119
v PLp0: 47Jso4to4QyolceEe	9978p7+	3	µg/b	<3	5L µg/b	1L1	p1	151
v PLp0: E7XcyQr eE@Ee	1L073178	3	µg/b	<3	5L µg/b	1L0	+3	151
Eb0a4t : MoVof 9f v8f t roN sl3f 59drof srGoVP 8) (Col: 1anD1DQ								
v PLp0: WyQteEe	1LL70573	3	µg/b	<3	5L µg/b	93Qp	p0	155
v PLp0: Jso4to4Qr eE@Ee	9878578	3	µg/b	<3	5L µg/b	98Q8	8L	15L
v PLp0: E7Pto4Qr eE@Ee	1L67+371	3	µg/b	<3	5L µg/b	90G+	pL	15L
v PLp0: 1G3G7TtnDeydQr eE@Ee	1L87+p78	3	µg/b	<3	5L µg/b	9pQ0	p1	119
v PLp0: seR7XcyQr eE@Ee	1637987 8	3	µg/b	<3	5L µg/b	93Q8	p5	15L
v PLp0: 1G5Q7TtnDeydQr eE@Ee	937+67+	3	µg/b	<3	5L µg/b	93Q8	p6	119
v PLp0: yety7XcyQr eE@Ee	987L+7+	3	µg/b	<3	5L µg/b	9pQp	p6	119
v PLp0: 47Jso4to4QyolceEe	9978p7+	3	µg/b	<3	5L µg/b	96Q0	p1	151
v PLp0: E7XcyQr eE@Ee	1L073178	3	µg/b	<3	5L µg/b	89G+	+3	151
Eb0a4B: Ox9geVsled (oN 7ocVdP 8) (Col: 1anD1D1i								
v PLp0: I rEQ VReyaye	1L87L370	3L	µg/b	<3L	5LL µg/b	+9Q8	3p	161

Wcr 7u ay:nx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Eb0a4B: Ox9geVsled (oN7ocVdP 8) (Col: 1anD1D1i uf oVl3/ced								
v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	5LL µg/b	1L0	+9	163
v PLp0: 07u eydO7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	5LL µg/b	9p01	+8	16+
v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	5LL µg/b	9p01	+8	168
Eb0a4B: Ox9geVsled (oN7ocVdP 8) (Col: 1anD1DQ)								
v PLp0: I rEO VReyaye	1L87L370	3L	µg/b	<3L	5LL µg/b	1L5	3p	161
v PLp0: 57XcyaEoEe (u v K)	p879676	3L	µg/b	<3L	5LL µg/b	1L3	+9	163
v PLp0: 07u eydO7574eEyaEoEe (u JXK)	1L871L71	3L	µg/b	<3L	5LL µg/b	11L	+8	16+
v PLp0: 57HexaEoEe (u XK)	3917p87+	3L	µg/b	<3L	5LL µg/b	11L	+8	168
Eb0a4(: pcv-oVsled (oN7ocVdP 8) (Col: 1anD1D1i								
v PLp0: i atr oE . rsclfn e	p37137L	3	µg/b	<3	5L µg/b	115	+p	15p
Eb0a4(: pcv-oVsled (oN7ocVdP 8) (Col: 1anD1DQ)								
v PLp0: i atr oE . rsclfn e	p37137L	3	µg/b	<3	5L µg/b	93O5	+p	15p
Eb0a46 : FcN3gsVIP 8) (Col: 1anD1D1i								
v PLp0: 5O67MnRdloto4to4aEe	39075L7p	3	µg/b	<3	5L µg/b	9p01	39	158
v PLp0: 1O67MnRdloto4to4aEe	p878p73	3	µg/b	<3	5L µg/b	9pO9	pp	151
v PLp0: Rts71O67MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	5L µg/b	96Op	pL	118
v PLp0: ytaEs71O67MnRdloto4to4OeEe	1LL+17L57+	3	µg/b	<3	5L µg/b	9801	++	15L
v PLp0: 1O67MnrtoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	5L µg/b	99O1	p8	150
Eb0a46 : FcN3gsVIP 8) (Col: 1anD1DQ)								
v PLp0: 5O67MnRdloto4to4aEe	39075L7p	3	µg/b	<3	5L µg/b	9pO9	39	158
v PLp0: 1O67MnRdloto4to4aEe	p878p73	3	µg/b	<3	5L µg/b	1L3	pp	151
v PLp0: Rts71O67MnRdloto4to4OeEe	1LL+17L173	3	µg/b	<3	5L µg/b	95O+	pL	118
v PLp0: ytaEs71O67MnRdloto4to4OeEe	1LL+17L57+	3	µg/b	<3	5L µg/b	8pO+	++	15L
v PLp0: 1O67MnrtoDoeydaEe (v MX)	1L+79670	3	µg/b	<3	5L µg/b	98Op	p8	150
Eb0a4E: 5svogeVsled t v87hsl3F (oN7ocVdP 8) (Col: 1anD1D1i								
v PLp0: MnRdloto. nlicotoDeydaEe	p37p178	3L	µg/b	<3L	5LL µg/b	118	38	108
v PLp0: i dlotoDeydaEe	p078p76	3L	µg/b	<3L	5LL µg/b	116	+5	105
v PLp0: I rEO RdlotnE	p37L170	3L	µg/b	<3L	5LL µg/b	110	+1	101
v PLp0: XtoDoDeydaEe	p078679	3L	µg/b	<3L	5LL µg/b	111	3p	161
v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	5LL µg/b	111	+0	168
v PLp0: TtnRdlotoflcotoDeydaEe	p37+970	3L	µg/b	<3L	5LL µg/b	1Lp	+p	161
v PLp0: 1O7MnRdlotoeydeEe	p376370	3	µg/b	<3	5L µg/b	1L5	p1	153
v PLp0: Jb. oDeydaEe	p078870	3	µg/b	<3	5L µg/b	95O1	+1	163
v PLp0: ytaEs71O67MnRdlotoeydeEe	13+7+L73	3	µg/b	<3	5L µg/b	1L5	p3	151
v PLp0: 1O7MnRdlotoeydaEe	p376076	3	µg/b	<3	5L µg/b	1L0	pp	151
v PLp0: Rts71O67MnRdlotoeydeEe	13+73975	3	µg/b	<3	5L µg/b	1LL	p8	155
v PLp0: 1O1O7TtnRdlotoeydaEe	p17337+	3	µg/b	<3	5L µg/b	99O+	pL	15L
v PLp0: 1O7MnRdloto4to4OeEe	3+67387+	3	µg/b	<3	5L µg/b	99O5	p0	155

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1D1i ufoVl3Vced								
v PLp0: i atr oE TeytaRdlotn e	3+7567 3	3	µg/b	<3	5L µg/b	1L5	3p	156
v PLp0: 1G67MnRdlotoeydaEe	1Lp7L+75	3	µg/b	<3	5L µg/b	1L0	p3	153
v PLp0: TtnRdlotoeydeEe	p97L17+	3	µg/b	<3	5L µg/b	1L5	pp	151
v PLp0: MnrtoDoDeydaEe	p07937 6	3	µg/b	<3	5L µg/b	99C	p+	155
v PLp0: 1CC67TtnRdlotoeydaEe	p97LL73	3	µg/b	<3	5L µg/b	98C	p8	15+
v PLp0: 1G67MnRdloto4to4aEe	1057 5879	3	µg/b	<3	5L µg/b	1LL	p9	153
v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	5L µg/b	98G	p+	155
v PLp0: 1CCG67TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	5L µg/b	91C	+3	119
v PLp0: ytaEs71G7MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	5L µg/b	8LG	0+	15+
v PLp0: Rts71G7MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	5L µg/b	8+G	30	165
v PLp0: 1CG567TeytaRdlotoeydaEe	p976073	3	µg/b	<3	5L µg/b	1L5	p3	161
v PLp0: 1G67TtnRdloto4to4aEe	9+71870	3	µg/b	<3	5L µg/b	9+C	p3	166
v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	5L µg/b	9pG	0+	118
v PLp0: 1G67MnrtoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	5L µg/b	9+G	30	150
v PLp0: HexaRdlotor cya. neEe	8p7+876	3	µg/b	<3	5L µg/b	111	3L	160
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1DCi								
v PLp0: MnRdloto. nlicotoDeydaEe	p37p178	3L	µg/b	<3L	5LL µg/b	960	38	108
v PLp0: i dlotoDeydaEe	p078p76	3L	µg/b	<3L	5LL µg/b	9pQ	+5	105
v PLp0: I nECi Rdlotn e	p37L170	3L	µg/b	<3L	5LL µg/b	896	+1	101
v PLp0: XtoDoDeydaEe	p078679	3L	µg/b	<3L	5LL µg/b	+pG	3p	161
v PLp0: i dlotoeydaEe	p37LL76	3L	µg/b	<3L	5LL µg/b	p8Q	+0	168
v PLp0: TtnRdlotoflcotoDeydaEe	p37+970	3L	µg/b	<3L	5LL µg/b	900	+p	161
v PLp0: 1G67MnRdlotoeydeEe	p37637 0	3	µg/b	<3	5L µg/b	906	p1	153
v PLp0: Jb. oDeydaEe	p078870	3	µg/b	<3	5L µg/b	115	+1	163
v PLp0: ytaEs71G67MnRdlotoeydeEe	13+7+L73	3	µg/b	<3	5L µg/b	95G	p3	151
v PLp0: 1G67MnRdlotoeydaEe	p37607 6	3	µg/b	<3	5L µg/b	98G	pp	151
v PLp0: Rts71G67MnRdlotoeydeEe	13+73975	3	µg/b	<3	5L µg/b	9+G	p8	155
v PLp0: 1CG67TtnRdlotoeydaEe	p17337+	3	µg/b	<3	5L µg/b	91G	pL	15L
v PLp0: 1G67MnRdloto4to4CeEe	3+67387+	3	µg/b	<3	5L µg/b	91C	p0	155
v PLp0: i atr oE TeytaRdlotn e	3+7567 3	3	µg/b	<3	5L µg/b	81G	3p	156
v PLp0: 1G67MnRdlotoeydaEe	1Lp7L+75	3	µg/b	<3	5L µg/b	950	p3	153
v PLp0: TtnRdlotoeydeEe	p97L17+	3	µg/b	<3	5L µg/b	93C	pp	151
v PLp0: MnrtoDoDeydaEe	p07937 6	3	µg/b	<3	5L µg/b	9pQ	p+	155
v PLp0: 1CC67TtnRdlotoeydaEe	p97LL73	3	µg/b	<3	5L µg/b	99G	p8	15+
v PLp0: 1G67MnRdloto4to4aEe	1057 5879	3	µg/b	<3	5L µg/b	1L1	p9	153
v PLp0: TeytaRdlotoeydeEe	15p71870	3	µg/b	<3	5L µg/b	936	p+	155
v PLp0: 1CCG67TeytaRdlotoeydaEe	+6L75L7+	3	µg/b	<3	5L µg/b	950	+3	119
v PLp0: ytaEs71G7MnRdloto757r cyeEe	11L73p7+	3	µg/b	<3	5L µg/b	93G	0+	15+
v PLp0: Rts71G7MnRdloto757r cyeEe	10p+71173	3	µg/b	<3	5L µg/b	88G	30	165

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Eb0a4E: 5svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1DQi ufoVl3Vced								
v PLp0: 1O1567TeytaRdlotoeydaEe	p976073	3	µg/b	<3	5L µg/b	1Lp	p3	161
v PLp0: 1567TtnRdloto4to4aEe	9+71870	3	µg/b	<3	5L µg/b	1L9	p3	166
v PLp0: PeEyaRdlotoeydaEe	p+7L17p	3	µg/b	<3	5L µg/b	8pO3	0+	118
v PLp0: 1567MnntoDo767Rdloto4to4aEe	9+71578	3	µg/b	<3	5L µg/b	9pO3	30	150
v PLp0: HexaRdlotor cya. neEe	8p7+876	3	µg/b	<3	5L µg/b	p3O+	3L	160
Eb0a4F: 5svogeVsled t roNsl3f (oN 7ocVdP 8) (Col: 1anD1D1i								
v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	<3	5L µg/b	1L5	81	151
v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	5L µg/b	980O	p3	119
v PLp0: 571 dlotoyolceEe	9370978	3	µg/b	<3	5L µg/b	1L1	p6	151
v PLp0: 071 dlotoyolceEe	1L+70670	3	µg/b	<3	5L µg/b	1L6	p5	15L
v PLp0: 1O67MnRdlotor eE@Ee	3017p671	3	µg/b	<3	5L µg/b	1L0	p6	119
v PLp0: 1O07MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	5L µg/b	1Lp	p0	15L
v PLp0: 1567MnRdlotor eE@Ee	9373L71	3	µg/b	<3	5L µg/b	1L0	p8	118
v PLp0: 1567O7TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	5L µg/b	11L	3+	158
v PLp0: 1567O7TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	5L µg/b	110	+9	156
Eb0a4F: 5svogeVsled t roNsl3f (oN 7ocVdP 8) (Col: 1anD1DQi								
v PLp0: i dlotor eE@Ee	1L879L7p	3	µg/b	<3	5L µg/b	1L1	81	151
v PLp0: XtoDor eE@Ee	1L878+71	3	µg/b	<3	5L µg/b	983O	p3	119
v PLp0: 571 dlotoyolceEe	9370978	3	µg/b	<3	5L µg/b	980L	p6	151
v PLp0: 071 dlotoyolceEe	1L+70670	3	µg/b	<3	5L µg/b	90O3	p5	15L
v PLp0: 1O67MnRdlotor eE@Ee	3017p671	3	µg/b	<3	5L µg/b	9+O3	p6	119
v PLp0: 1O07MnRdlotor eE@Ee	1L+70+7p	3	µg/b	<3	5L µg/b	9pO3	p0	15L
v PLp0: 1567MnRdlotor eE@Ee	9373L71	3	µg/b	<3	5L µg/b	990O	p8	118
v PLp0: 1567O7TtnRdlotor eE@Ee	15L78571	3	µg/b	<3	5L µg/b	83O3	3+	158
v PLp0: 1567O7TtnRdlotor eE@Ee	8p7+17+	3	µg/b	<3	5L µg/b	95O5	+9	156
Eb0a42 : Sr3hsvoNelhsVeP 8) (Col: 1anD1D1i								
v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	5L µg/b	1L3	pp	151
v PLp0: XtoDo. nRdlotoDeydaEe	p375p70	3	µg/b	<3	5L µg/b	9pO6	+9	11p
v PLp0: MnntoDoRdlotoDeydaEe	1507O871	3	µg/b	<3	5L µg/b	98O+	39	119
v PLp0: XtoDofotD	p375375	3	µg/b	<3	5L µg/b	995O	09	151
Eb0a42 : Sr3hsvoNelhsVeP 8) (Col: 1anD1DQi								
v PLp0: i dlotofotD	+p7++76	3	µg/b	<3	5L µg/b	96O1	pp	151
v PLp0: XtoDo. nRdlotoDeydaEe	p375p70	3	µg/b	<3	5L µg/b	889O	+9	11p
v PLp0: MnntoDoRdlotoDeydaEe	1507O871	3	µg/b	<3	5L µg/b	85O1	39	119
v PLp0: XtoDofotD	p375375	3	µg/b	<3	5L µg/b	8LO1	09	151
Eb0aQ8plMiB: bov8Vcfvesr t roNsl3f 59drofsrGoVP 8) (Col: 1anl Ql Di								
v PLp3(Wlu): Na4dydaleEe	9175L76	1	µg/b	<1O.	3 µg/b	00O6	5pO3	150
v PLp3(Wlu): VReEa4dydOeEe	5L879+78	1	µg/b	<1O.	3 µg/b	0+O.	63	159

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Eb0aC8plMiB: bov8Vcfvesr t roNsl3f 59drofsrGoVP 8) (Col: 1anl Cl Di uf oVl3Vced								
v PLp3(Wlu): VReEa4dydeEe	867659	1	µg/b	<10.	3 µg/b	083	63	15p
v PLp3(Wlu): FlcoteEe	8+7p67p	1	µg/b	<10.	3 µg/b	335	6+	16L
v PLp3(Wlu): PdeEaEydteEe	837L178	1	µg/b	<10.	3 µg/b	p69	05	165
v PLp3(Wlu): VEydtaReEe	15L7157p	1	µg/b	<10.	3 µg/b	p0G	05	165
v PLp3(Wlu): FlcotaEydeEe	5L+7007L	1	µg/b	<10.	3 µg/b	85G	01	101
v PLp3(Wlu): PCteEe	1597LL7L	1	µg/b	<10.	3 µg/b	8+0.	0L	105
v PLp3(Wlu): XeE@a)aEydtaReEe	3+73376	1	µg/b	<10.	3 µg/b	815	66	136
v PLp3(Wlu): i dtCseEe	5187L179	1	µg/b	<10.	3 µg/b	853	6p	103
v PLp3(Wlu): XeE@(r)flcotaEydeEe	5L379975	1	µg/b	<10.	3 µg/b	8+G5	63	131
v PLp3(Wlu): XeE@(k)flcotaEydeEe	5Lp7L879	1	µg/b	<10.	3 µg/b	p86	69	101
v PLp3(Wlu): XeE@(a)4CteEe	3L76578	LG3	µg/b	<LG3	3 µg/b	p93	01	169
v PLp3(Wlu): JE. eEo(1G5G6R)4CteEe	1967693	1	µg/b	<10.	3 µg/b	91p	63	101
v PLp3(Wlu): MrreE@aCl)aEydtaReEe	367pL76	1	µg/b	<10.	3 µg/b	950.	6+	105
v PLp3(Wlu): XeE@(gCl0)4etCeEe	1917S075	1	µg/b	<10.	3 µg/b	9Lp	1L	105
Eb0aC8plMiB: bov8Vcfvesr t roNsl3f 59drofsrGoVP 8) (Col: 1anl CaCl								
v PLp3(Wlu): Na4dydaleEe	9175L76	1	µg/b	<10.	3 µg/b	ppC	5pG3	150
v PLp3(Wlu): VReEa4dydCeEe	5L879+78	1	µg/b	<10.	3 µg/b	p80	63	159
v PLp3(Wlu): VReEa4dydeEe	867659	1	µg/b	<10.	3 µg/b	85G	63	15p
v PLp3(Wlu): FlcoteEe	8+7p67p	1	µg/b	<10.	3 µg/b	880.	6+	16L
v PLp3(Wlu): PdeEaEydteEe	837L178	1	µg/b	<10.	3 µg/b	89p	05	165
v PLp3(Wlu): VEydtaReEe	15L7157p	1	µg/b	<10.	3 µg/b	8+G3	05	165
v PLp3(Wlu): FlcotaEydeEe	5L+7007L	1	µg/b	<10.	3 µg/b	+93	01	101
v PLp3(Wlu): PCteEe	1597LL7L	1	µg/b	<10.	3 µg/b	pp0.	0L	105
v PLp3(Wlu): XeE@a)aEydtaReEe	3+73376	1	µg/b	<10.	3 µg/b	8+0.	66	136
v PLp3(Wlu): i dtCseEe	5187L179	1	µg/b	<10.	3 µg/b	p0C	6p	103
v PLp3(Wlu): XeE@(r)flcotaEydeEe	5L379975	1	µg/b	<10.	3 µg/b	869	63	131
v PLp3(Wlu): XeE@(k)flcotaEydeEe	5Lp7L879	1	µg/b	<10.	3 µg/b	p10.	69	101
v PLp3(Wlu): XeE@(a)4CteEe	3L76578	LG3	µg/b	<LG3	3 µg/b	+90.	01	169
v PLp3(Wlu): JE. eEo(1G5G6R)4CteEe	1967693	1	µg/b	<10.	3 µg/b	833	63	101
v PLp3(Wlu): MrreE@aCl)aEydtaReEe	367pL76	1	µg/b	<10.	3 µg/b	803	6+	105
v PLp3(Wlu): XeE@(gCl0)4etCeEe	1917S075	1	µg/b	<10.	3 µg/b	p+G	1L	105
Eb0m0/0a1: SolsvbelrovecN 59drofsrGoVP 8) (Col: 1anl Cl mi								
v PLp1: i 1L 7i 10 FtaRymE	7777	3L	µg/b	<3L	300L µg/b	8+G3	+0	150
v PLp1: i 13 7i 58 FtaRymE	7777	1LL	µg/b	<1LL	1p850 µg/b	9pQp	pL	16L
v PLp1: i 59 7i 6+ FtaRymE	7777	3L	µg/b	<3L	6+90 µg/b	1L0	+8	158
Eb0m0/0a1: SolsvbelrovecN 59drofsrGoVP 8) (Col: 1anl Ca4i								
v PLp1: i 1L 7i 10 FtaRymE	7777	3L	µg/b	<3L	300L µg/b	119	+0	150
v PLp1: i 13 7i 58 FtaRymE	7777	1LL	µg/b	<1LL	1p850 µg/b	11L	pL	16L
v PLp1: i 59 7i 6+ FtaRymE	7777	3L	µg/b	<3L	6+90 µg/b	115	+8	158

Wcr 7u aytnx: **Wt SEH**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Eb0n0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anD1DAi								
v PL8L: i + 7i 9 FtaRyoE	7777	5L	µg/b	<5L	65L µg/b	1L0	p5	16+
Eb0n0/0a1: SolsvbelrovecN 59drof srGoVP 8) (Col: 1anD1D4i								
v PL8L: i + 7i 9 FtaRyoE	7777	5L	µg/b	<5L	65L µg/b	1L1	p5	16+
Eb0n0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anl Cl mi								
v PLp1: >i 1L 7i 1+ FtaRyoE	7777	1LL	µg/b	<1LL	1L65L µg/b	p5O9	pL	16L
v PLp1: >i 1+ 7i 60 FtaRyoE	7777	1LL	µg/b	<1LL	1++0L µg/b	99O+	pL	16L
v PLp1: >i 60 7i 0L FtaRyoE	7777	1LL	µg/b	<1LL	1L8L µg/b	111	pL	16L
Eb0n0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anl Qa4i								
v PLp1: >i 1L 7i 1+ FtaRyoE	7777	1LL	µg/b	<1LL	1L65L µg/b	95O+	pL	16L
v PLp1: >i 1+ 7i 60 FtaRyoE	7777	1LL	µg/b	<1LL	1++0L µg/b	11L	pL	16L
v PLp1: >i 60 7i 0L FtaRyoE	7777	1LL	µg/b	<1LL	1L8L µg/b	113	pL	16L
Eb0n0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anD1DAi								
v PL8L: i + 7i 1L FtaRyoE	7777	5L	µg/b	<5L	6pL µg/b	1L0	pL	16L
Eb0n0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6rs-l 8) (Col: 1anD1D4i								
v PL8L: i + 7i 1L FtaRyoE	7777	5L	µg/b	<5L	6pL µg/b	99O1	pL	16L
Eb0n0: BSEXR 8) (Col: 1anD1DAi								
v PL8L: XeE@Ee	p170675	1	µg/b	<1	5L µg/b	99O9	p6	15p
v PL8L: TolceEe	1L878876	5	µg/b	<5	5L µg/b	9pO6	p0	158
v PL8L: v ydOr eE@Ee	1LL70170	5	µg/b	<5	5L µg/b	90Op	p5	15+
v PL8L: Deya7& 4ata72OeEe	1L876876 1L+70576	5	µg/b	<5	0L µg/b	9p01	+9	166
v PL8L: otydo72OeEe	9370p7+	5	µg/b	<5	5L µg/b	93O+	p0	158
v PL8L: Na4dydaleEe	9175L76	3	µg/b	<3	3 µg/b	1Lp	pL	16L
Eb0n0: BSEXR 8) (Col: 1anD1D4i								
v PL8L: XeE@Ee	p170675	1	µg/b	<1	5L µg/b	98O9	p6	15p
v PL8L: TolceEe	1L878876	5	µg/b	<5	5L µg/b	93Op	p0	158
v PL8L: v ydOr eE@Ee	1LL70170	5	µg/b	<5	5L µg/b	9+O+	p5	15+
v PL8L: Deya7& 4ata72OeEe	1L876876 1L+70576	5	µg/b	<5	0L µg/b	1L5	+9	166
v PL8L: otydo72OeEe	9370p7+	5	µg/b	<5	5L µg/b	9+O+	p0	158
v PL8L: Na4dydaleEe	9175L76	3	µg/b	<3	3 µg/b	ppO8	pL	16L

Matrix Spike (MS) Report

Tde qcalnyC RoEytol yetD u aytnx W4rnke (u Wj tefets yo aE nEytalar otayotC s4lny saD4le s4rnke. z nyd a te4teseEyaynne sey of yatgey aEalOyesO Tde 4ct4ose of ydns Qi 4ataDeyet ns yo DoEnyot 4oyeEyal Daytnx effeRys oE aEalOye teRometnesOWyaynR AeRometCbnDnys as 4et lar otayotCMaya QcalnyCBr -eRynnes (MQBs)QU eal teRometCtaEges syaye. DaCr e z annne. nEyde emeEyof saD4le Daytnx nEyetfeteERseO

Wcr 7u aytnx: **Wt SEH**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
E6 0412 : pcv-sle 8ScrG3d3N elr3f i sP pO4 AuG9 6 t 8) (Col: 1an4A4Qi							
v u 11L05+07LL5	VEoECDocs	v ML01G: Wclfaye as WB0 7Tctr n nDeytnR	108L87p978	1L Dg/b	# NoyMeyetDnEe.	pL	16L
E6 0412 : pcv-sle 8ScrG3d3N elr3f i sP pO4 AuG9 6 t 8) (Col: 1an4AQDi							
v u 11L058+7LL5	Gh 0	v ML01G: Wclfaye as WB0 7Tctr n nDeytnR	108L87p978	1L Dg/b	# NoyMeyetDnEe.	pL	16L
E6 04Q2 : (hvor3de 6 3Pf rele sVsv9Per 8) (Col: 1an4A44i							
v u 11L05+07LL5	VEoECDocs	v ML03G: i dlotn e	1+88p7LL7+	0LL Dg/b	# NoyMeyetDnEe.	pL	16L
E6 04Q2 : (hvor3de 6 3Pf rele sVsv9Per 8) (Col: 1an4A4Di							
v u 11L058+7LL5	Gh 0	v ML03G: i dlotn e	1+88p7LL7+	0LL Dg/b	86Q	pL	16L
E6 04Q2 : (hvor3de 6 3Pf rele sVsv9Per 8) (Col: 1an4AQ4i							
v u 11L058+7L55	Gh 06M	v ML03G: i dlotn e	1+88p7LL7+	0LL Dg/b	# NoyMeyetDnEe.	pL	16L
E2 0A0F: 63PPowyed MelsvP G9 l(buMp 8) (Col: 1an4Dm0i							
v u 11L05817LL1	VEoECDocs	v GL5LV7F: VtseEnR	p00L76875	L05 Dg/b	1L1	89	169
		v GL5LV7F: i a. DncD	p00L70679	L0L3 Dg/b	115	p3	161
		v GL5LV7F: i or aly	p00L70870	L05 Dg/b	116	pp	159
		v GL5LV7F: i o44et	p00L73L78	L05 Dg/b	1L8	p1	15p
		v GL5LV7F: bea.	p06979571	L05 Dg/b	9p09	p1	156
		v GL5LV7F: u aEgaEese	p06979+73	L05 Dg/b	1L0	++	165
		v GL5LV7F: NnRkel	p00L7L57L	L05 Dg/b	111	p6	159
		v GL5LV7F: ZnER	p00L7++7+	L05 Dg/b	1L+	+8	16+
E2 0A0F: 63PPowyed MelsvP G9 l(buMp 8) (Col: 1an4DmAi							
v u 11L058+7L5L	Gh 01	v GL5LV7F: VtseEnR	p00L76875	L05 Dg/b	990	89	169
		v GL5LV7F: i a. DncD	p00L70679	L0L3 Dg/b	115	p3	161
		v GL5LV7F: i or aly	p00L70870	L05 Dg/b	119	pp	159
		v GL5LV7F: i o44et	p00L73L78	L05 Dg/b	11L	p1	15p
		v GL5LV7F: bea.	p06979571	L05 Dg/b	980L	p1	156
		v GL5LV7F: u aEgaEese	p06979+73	L05 Dg/b	1L5	++	165
		v GL5LV7F: NnRkel	p00L7L57L	L05 Dg/b	110	p6	159
		v GL5LV7F: ZnER	p00L7++7+	L05 Dg/b	115	+8	16+
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi							
v u 11L056p7LL6	VEoECDocs	v GL5LV7T: VtseEnR	p00L76875	1 Dg/b	110	p5	10+
		v GL5LV7T: i a. DncD	p00L70679	L053 Dg/b	1Lp	p6	161
		v GL5LV7T: i or aly	p00L70870	1 Dg/b	1L9	+8	165
		v GL5LV7T: i o44et	p00L73L78	1 Dg/b	116	p1	153
		v GL5LV7T: bea.	p06979571	1 Dg/b	1L0	+8	16L
		v GL5LV7T: u aEgaEese	p06979+73	1 Dg/b	1L5	+6	159

Wcr 7u aytnx: **Wt SEH**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
E2 0A0S: SolsvMelsvP G9 l(buMp 8) (Col: 1an4Dnmi uf oVl3Vced							
v u 11L056p7LL6	VEoECDocs	v GL5LV7T: NnRkel	p00L7L57L	1 Dg/b	116	p5	158
		v GL5LV7T: ZnER	p00L7++7+	1 Dg/b	111	+p	159
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4DaDi							
v u 11L058+7LL1	Gh 6	v GL63F: u etRctC	p06979p7+	L01LL Dg/b	1L1	pL	16L
E2 0l QF: 63PPowyed Merf cr9 G9 FLMp 8) (Col: 1an4Dm1i							
v u 11L058+7L5L	Gh 01	v GL63F: u etRctC	p06979p7+	L01LL Dg/b	9L03	pL	16L
E2 0l QS: SolsvHef oyersGve Merf cr9 G9 FLMp 8) (Col: 1aa0n11i							
v u 11L056p7LL0	VEoECDocs	v GL63T: u etRctC	p06979p7+	L01LL Dg/b	1Lp	pL	16L
E2 0Q0F: 63PPowyed 5exsysveVl (hroN3cN 8) (Col: 1anmmnAi							
v u 11L05867L50	VEoECDocs	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LG3 Dg/b	8+01	pL	16L
E2 0Q0F: 63PPowyed 5exsysveVl (hroN3cN 8) (Col: 1anmmn1i							
v u 11L058+7L5L	Gh 01	v GL3LF: HexamaleEyi dtoDmcD	1830L75979	LG3 Dg/b	1L5	pL	16L
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQmi							
v u 11L019L7LL+	VEoECDocs	v KL53G: Ftee i CaEn e	7777	LG3 Dg/b	9803	pL	16L
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anmaQDi							
v u 11L058+7L16	Gh 56	v KL53G: Ftee i CaEn e	7777	LG3 Dg/b	p+01	pL	16L
EK0AQ2: Free f 9sV3de G9 63Pf rele t Vsv9Per 8) (Col: 1anman0i							
v u 11L058p7LL5	VEoECDocs	v KL53G: Ftee i CaEn e	7777	LG3 Dg/b	1L6	pL	16L
EK0An2: Solsv(9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anman1i							
v u 11L058+7LL5	Gh 0	v KL5+G: Toyal i CaEn e	3p71573	LG5 Dg/b	9p03	pL	16L
EK0An2: Solsv(9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anmanAi							
v u 11L058+7L55	Gh 06M	v KL5+G: Toyal i CaEn e	3p71573	LG5 Dg/b	pLG+	pL	16L
EK0Am2: Wesk t f3l 63PPof 3sGve (9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anmanl i							
v u 11L058+7LL5	Gh 0	v KL58G: h eak VRn MnssoRrarle i CaEn e	7777	LG3 Dg/b	9+03	pL	16L
EK0Am2: Wesk t f3l 63PPof 3sGve (9sV3de B9 63Pf rele t Vsv9Per 8) (Col: 1anman4i							
v u 11L058+7L55	Gh 06M	v KL58G: h eak VRn MnssoRrarle i CaEn e	7777	LG3 Dg/b	1L3	pL	16L
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4nDi							
v u 11L05L97LL5	VEoECDocs	v KL0LP: Flcotn e	1+98070878	301 Dg/b	8L05	pL	16L
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4al i							
v u 11L058+7L11	Gh 51	v KL0LP: Flcotn e	1+98070878	301 Dg/b	9001	pL	16L
EK040b: Fvcor3de G9 b(S3rslor 8) (Col: 1anQ4aQi							
v u 11L058p7LL5	VEoECDocs	v KL0LP: Flcotn e	1+98070878	301 Dg/b	9pG+	pL	16L
EK0Qa2: R3r3e sP R G9 63Pf rele t Vsv9Per 8) (Col: 1an4A41i							
v u 11L05097LL5	VEoECDocs	v KL3pG: Nnytne as N	7777	LG3 Dg/b	118	pL	16L

Wcr 7u aytnx: **Wt SEH**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EK0Qa2 : R3r3e sP R G9 6 3Pf rele t Vsv9Per 8) (Col: 1an4A4ai							
v u 11L058+7LL5	Gh 0	v KL3pG: Nnytne as N	7777	LQ3 Dg/b	11L	pL	16L
EK0Qa2 : R3r3e sP R G9 6 3Pf rele t Vsv9Per 8) (Col: 1an4AQAi							
v u 11L058+7L55	Gh 06M	v KL3pG: Nnytne as N	7777	LQ3 Dg/b	151	pL	16L
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 6 3Pf rele t Vsv9Per 8) (Col: 1anDmmi							
v u 11L058+7LL5	Gh 0	v KL39G: Nnytne w Nnytaye as N	7777	LQ3 Dg/b	# NoyMeyetDnEe.	pL	16L
EK0QD2 : R3r3e 7vcP R3rsle sP R 8ROxi G9 6 3Pf rele t Vsv9Per 8) (Col: 1anDmmi							
v u 11L058+7L51	Gh 05M	v KL39G: Nnytne w Nnytaye as N	7777	LQ3 Dg/b	155	pL	16L
EK0a12 : Hesf l3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4A4ni							
v u 11L058+7LL5	Gh 0	v KLp1G: AeaRyme Pdos4dotcs as P	7777	LQ3 Dg/b	115	pL	16L
EK0a12 : Hesf l3ye bhoP7horcP sP b G9 d3Pf rele sVsv9Per 8) (Col: 1an4AQIi							
v u 11L058+7L55	Gh 06M	v KLp1G: AeaRyme Pdos4dotcs as P	7777	LQ3 Dg/b	115	pL	16L
Eb0a4E: 5 svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1D1i							
v u 11L058+7LL5	Gh 0	v PLp0: 1Q7MnRdlotoeydeEe	p376370	5L µg/b	# 119	30	1L0
		v PLp0: TtnRdlotoeydeEe	p97L17+	5L µg/b	116	+5	15L
Eb0a4E: 5 svogeVsled t v87hsl3f (oN 7ocVdP 8) (Col: 1anD1DQi							
v u 11L058+7L55	Gh 06M	v PLp0: 1Q7MnRdlotoeydeEe	p376370	5L µg/b	83Q9	30	1L0
		v PLp0: TtnRdlotoeydeEe	p97L17+	5L µg/b	8pQ0	+5	15L
Eb0a4F: 5 svogeVsled t roN sl3f (oN 7ocVdP 8) (Col: 1anD1D1i							
v u 11L058+7LL5	Gh 0	v PLp0: i dlotor eE@Ee	1L879L7p	5L µg/b	111	+8	165
Eb0a4F: 5 svogeVsled t roN sl3f (oN 7ocVdP 8) (Col: 1anD1DQi							
v u 11L058+7L55	Gh 06M	v PLp0: i dlotor eE@Ee	1L879L7p	5L µg/b	98G6	+8	165
Eb0m0/0a1: Solsvbelrovec N 59drof srGoVP 8) (Col: 1anD1DAi							
v u 11L058+7LL5	Gh 0	v PL8L: i + 7i 9 FtaRymE	7777	58L µg/b	118	31	153
Eb0m0/0a1: Solsvbelrovec N 59drof srGoVP 8) (Col: 1anD1D4i							
v u 11L058+7L55	Gh 06M	v PL8L: i + 7i 9 FtaRymE	7777	58L µg/b	88G+	31	153
Eb0m0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6 rs-l 8) (Col: 1anD1DAi							
v u 11L058+7LL5	Gh 0	v PL8L: i + 7i 1L FtaRymE	7777	66L µg/b	151	pL	16L
Eb0m0/0a1: SolsvHef oyersGve 59drof srGoVP uREbM A010 6 rs-l 8) (Col: 1anD1D4i							
v u 11L058+7L55	Gh 06M	v PL8L: i + 7i 1L FtaRymE	7777	66L µg/b	91Q0	pL	16L
Eb0m0: BSEXR 8) (Col: 1anD1DAi							
v u 11L058+7LL5	Gh 0	v PL8L: XeE@Ee	p170675	5L µg/b	11L	+6	161
		v PL8L: TolceEe	1L878876	5L µg/b	1L+	+3	166
Eb0m0: BSEXR 8) (Col: 1anD1D4i							
v u 11L058+7L55	Gh 06M	v PL8L: XeE@Ee	p170675	5L µg/b	930Q	+6	161
		v PL8L: TolceEe	1L878876	5L µg/b	91G+	+3	166

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104286**	Page	: 1 of 3L
l ineEy	: v VI RDA VN v VTHb v HOTS c l RvVI v c	bat orayorC	: v EmnroED eEyai s nnMvoE N eit ourEe
l oEyaJy	: NO s HI Rs VHN v c	l oEyaJy	: l aroi h aiMd
H. . reMM	: PBABKA2 55F3 YAA Tc l OH, l R UH0 c TOHbRH 3L11	H. . reMM	: 4 h eMjaii O. c prnEgmaie l R HuMyraina 3171
v -Dani	: . jaDeM@eeMB nz	v -Dani	: JaroiBvaiMd@aiMeEmnroBloD
TeiepdoEe	: +61 96871666	TeiepdoEe	: +61-3-8F49 96L8
YaJMDnie	: +61 L3 96871844	YaJMDnie	: +61-3-8F49 96L1
ProjeJy	: 51LL74 HbXv OT PHOK GHc h A OKc	Ql bemei	: Vv PN 1999 c Jde. uie X(3) aE. Hbc Ql c 3 requnreD eEy
cnye	: ----		
l -A-l EuDt er	: ----	s aye c aD pieMOeJemne.	: 51-HPO-5L11
c aD pier	: ----	RMMue s aye	: L6-N H, -5L11
Ar. er EuDt er	: ----		
		VoBof MaD pieMreJemne.	: 3F
Quoye EuDt er	: N v/L1F/11 l 3	VoBof MaD pieMaEaiCMe.	: 3F

TdnMreporyMuperMe. eMaECpremnouMrepory(M) wnyd ydnMrefereEJeBOeMuiyMappiCyo yde MaD pie(M) aMMut Dnye. BHii pageMof ydnMreporydame t eeE JdeJke. aE. approme. for reieaMeB

TdnMREyerpreynne QuainyCl oEyroi OeporyJoEyanEMyde foiiownEg nEforDayroE:

- HEaiCMMSoi. nEg TnDe l oDpinaEJe
- QuainyCl oEyroi ParaDeyer YrequeEJCl oDpinaEJe
- Xnnef Neydo. cuDDarneM
- cuDDarCof AuyinerM

Analysis Holding Time Compliance

Tde foiiowrEg repory MuDDarrMeM exyraJyroE / preparayroE aE. aEaiCMM yrDeM aE. JoDpareM wryd reJoDDeE. e. doi. rEg yrDeMB s ayeM reporye. repreMeEy frrMy . aye of exyraJyroE or aEaiCMM aE. preJiu. eM MutMequeEy . riuyroEM aE. reruEMB REforDayroE rM aiMb promre. re yde MaDpie JoEyarEer (preMermayrre) froD wdrld yde aEaiCMM airquoy waM yakeEB viapMe. perro. yo aEaiCMM repreMeEyM EuDter of . aCM froD MaDpirEg wdere Eo exyraJyroE / . rgeMyroE rM rEmoire. or perro. froD exyraJyroE / . rgeMyroE wdere ydrM rM preMeEyB Yor JoDpoMye MaDpieMU MaDpirEg . aye rM aMMuDe. yo t e yday of yde oi. eMy MaDpie JoEyrtuyrEg yo yde JoDpoMyeB caDpie . aye for iat orayorC pro. uJe. ieaJdayeM rM aMMuDe. aM yde JoDpieyroE . aye of yde ieaJdrEg proJeMMB AuyirerM for doi. rEg yrDe are t aMe. oE 0cvPH ch 846UHPSHUHc aE. VvPN (1999)B H irMyrEg of t reaJdeM rM prorme. rE yde cuDDarCof AuyirerMB

Soi. rEg yrDeM for ieaJdaye Deydo. M (exJiu. rEg eiuyrayeM) rarC aJJor. rEg yo yde aEaiCyeM t erEg . eyerDrEe. oE yde reMuiyrEg MoiuyroEB Yor EoE-rroiayrie aEaiCyeMU yde doi. rEg yrDe JoDpirraEJe aMMeMMDeEy JoDpareM yde ieaJd . aye wryd yde MdoryeMy aEaiCye doi. rEg yrDe for yde equrrraieEy Mori Deydo. B TdeMe Mori doi. rEg yrDeM are: ArgaErJM (14 . aCM); NerJurC (58 . aCM) & oyder DeyaiM (18L . aCM)B H reJor. e. t reaJd yderefore . oeM Eoy guaraEyee a t reaJd for aii EoE-rroiayrie paraDeyerMB

Nayrrx: **WATER**

vrraiuayroE: × = Soi. rEg yrDe t reaJd ; ✓ = h rydrE doi. rEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	**----**	----	----	**27-APR-2011**	19-HPO-5L11	×
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	**----**	----	----	**27-APR-2011**	5L-HPO-5L11	×
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43sU	Gh 44sU							
s0P1U	cPbR1U							
s0P3U	cPbR3U							
Gh 19U	s0P4							
Clear Plastic Bottle - Natural								
Gh 45sU	cPbR4	**21-APR-2011**	**----**	----	----	**27-APR-2011**	51-HPO-5L11	×

Nayrx: **WATER**

vmaiuaymoE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / *Container* / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	**----**	----	----	**21-APR-2011**	56-HPO-5L11	✓
Clear Plastic Bottle - Natural								
Gh 39U	Gh 4L	**20-APR-2011**	**----**	----	----	**21-APR-2011**	57-HPO-5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	**----**	----	----	**27-APR-2011**	57-HPO-5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR1U							
s 0P3U	cPbR3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR4	**21-APR-2011**	**----**	----	----	**27-APR-2011**	58-HPO-5L11	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	**---**	L3-NH, -5L11	----	**28-APR-2011**	L3-NH, -5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	**---**	L4-NH, -5L11	----	**28-APR-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR1U							
s 0P3U	cPbR3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR4	**21-APR-2011**	**---**	LF-NH, -5L11	----	**28-APR-2011**	LF-NH, -5L11	✓

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**30-APR-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	---	18-NH, -5L11	----	**30-APR-2011**	18-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR 4	**21-APR-2011**	---	19-NH, -5L11	----	**30-APR-2011**	19-NH, -5L11	✓
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**30-APR-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	---	18-NH, -5L11	----	**30-APR-2011**	18-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR 4	**21-APR-2011**	---	19-NH, -5L11	----	**30-APR-2011**	19-NH, -5L11	✓

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yDe treaJd ; ✓ = h ndnE doi. nEg yDeB

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 1FU, Gh 36U, Gh 39U, Gh 41U, Gh 43s U, Gh 44s U, s0P1U, cPbRT1U, s0P4	**20-APR-2011**	---	18-NH, -5L11	----	**29-APR-2011**	18-NH, -5L11	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 45s	**21-APR-2011**	---	19-NH, -5L11	----	**29-APR-2011**	19-NH, -5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 9U, Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**29-APR-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 3U, Gh 4U, Gh 1LU, Gh 11U, Gh 13U, Gh 14U, Gh 16U, Gh 51U, Gh 55U, Gh 53U, Gh 54U, Gh 5FU, Gh 57U, Gh 4LU, s0P3U, cPbRT3U, Gh 19	**20-APR-2011**	---	18-NH, -5L11	----	**29-APR-2011**	18-NH, -5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
cPbRT4	**21-APR-2011**	---	19-NH, -5L11	----	**29-APR-2011**	19-NH, -5L11	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 1FU, Gh 36U, Gh 39U, Gh 41U, Gh 43s U, Gh 44s U, s0P1U, cPbRT1U, s0P4	**20-APR-2011**	---	17-AI T-5L11	----	**28-APR-2011**	17-AI T-5L11	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 45s	**21-APR-2011**	---	18-AI T-5L11	----	**28-APR-2011**	18-AI T-5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 9U, Gh 15	**19-APR-2011**	---	16-AI T-5L11	----	**28-APR-2011**	16-AI T-5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 3U, Gh 4U, Gh 1LU, Gh 11U, Gh 13U, Gh 14U, Gh 16U, Gh 51U, Gh 55U, Gh 53U, Gh 54U, Gh 5FU, Gh 57U, Gh 4LU, s0P3U, cPbRT3U, Gh 19	**20-APR-2011**	---	17-AI T-5L11	----	**28-APR-2011**	17-AI T-5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
cPbRT4	**21-APR-2011**	---	18-AI T-5L11	----	**28-APR-2011**	18-AI T-5L11	✓

Nayrnx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unspecified; Lab-acidified							
ORVcHTv-4	**21-APR-2011**	**28-APR-2011**	18-AI T-5L11	✓	**29-APR-2011**	18-AI T-5L11	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural							
Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**03-MAY-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 1FU Gh 39U Gh 43sU s0P1U s0P4	**20-APR-2011**	---	L4-NH, -5L11	----	**03-MAY-2011**	L4-NH, -5L11	✓
Gh 36U Gh 41U Gh 44sU cPbRT1U							
Clear Plastic Bottle - Unfiltered; Lab-acidified							
Gh 45s	**21-APR-2011**	---	LF-NH, -5L11	----	**03-MAY-2011**	LF-NH, -5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 9	**19-APR-2011**	---	17-NH, -5L11	----	**03-MAY-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Unspecified; Lab-acidified							
Gh 3U Gh 1LU Gh 13U Gh 16U Gh 55U Gh 54U Gh 57U s0P3U Gh 19	**20-APR-2011**	---	18-NH, -5L11	----	**03-MAY-2011**	18-NH, -5L11	✓
Gh 4U Gh 11U Gh 14U Gh 51U Gh 53U Gh 5FU Gh 4LU cPbRT3U							
Clear Plastic Bottle - Unspecified; Lab-acidified							
cPbRT4	**21-APR-2011**	---	19-NH, -5L11	----	**03-MAY-2011**	19-NH, -5L11	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unspecified; Lab-acidified							
ORVcHTv-4	**21-APR-2011**	**----**	----	----	**03-MAY-2011**	19-NH, -5L11	✓

Nayrx: **WATER**

vmaiuaymoE: × = Soi. nEg yDe treaJd ; ✓ = h ndnE doi. nEg yDeB

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG050F: Dissolved Hexavalent Chromium								
Clear Plastic Bottle - NaOH								
Gh 9U	Gh 15	**19-APR-2011**	**----**	----	----	**02-MAY-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - NaOH								
Gh 3U	Gh 4U	**20-APR-2011**	**----**	----	----	**02-MAY-2011**	18-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	Gh 19U							
s0P4								
Clear Plastic Bottle - NaOH								
Gh 45s U	cPbR4U	**21-APR-2011**	**----**	----	----	**02-MAY-2011**	19-NH, -5L11	✓
ORVcHTv-4								
EK025G: Free cyanide by Discrete Analyser								
White Plastic Bottle-NaOH								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
White Plastic Bottle-NaOH								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	Gh 19U							
s0P4								
White Plastic Bottle-NaOH								
Gh 45s U	cPbR4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**02-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4								

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe treaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
White Plastic Bottle-NaOH								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43sU	Gh 44sU							
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	Gh 19U							
s0P4								
White Plastic Bottle-NaOH								
Gh 45sU	cPbR4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4								
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
White Plastic Bottle-NaOH								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43sU	Gh 44sU							
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	Gh 19U							
s0P4								
White Plastic Bottle-NaOH								
Gh 45sU	cPbR4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**02-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4								

Nayrnx: **WATER**

vmaiuaymoE: × = Soi. nEg ynDe t reaJd ; ✓ = h nydnE doi. nEg ynDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**28-APR-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	---	18-NH, -5L11	----	**28-APR-2011**	18-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR 4	**21-APR-2011**	---	19-NH, -5L11	----	**28-APR-2011**	19-NH, -5L11	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	---	51-HPO-5L11	----	**21-APR-2011**	51-HPO-5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	---	55-HPO-5L11	----	**21-APR-2011**	55-HPO-5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR 4	**21-APR-2011**	---	53-HPO-5L11	----	**21-APR-2011**	53-HPO-5L11	✓

Nayrx: **WATER**

vmaiuaymoE: × = Soi. nEg yrDe treaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
Gh 9U	Gh 15	**19-APR-2011**	---	17-NH, -5L11	----	**04-MAY-2011**	17-NH, -5L11	✓
Clear Plastic Bottle - Sulfuric Acid								
Gh 3U	Gh 4U	**20-APR-2011**	---	18-NH, -5L11	----	**04-MAY-2011**	18-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Sulfuric Acid								
Gh 45s U	cPbR 4	**21-APR-2011**	---	19-NH, -5L11	----	**04-MAY-2011**	19-NH, -5L11	✓
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural								
Gh 9U	Gh 15	**19-APR-2011**	---	51-HPO-5L11	----	**21-APR-2011**	51-HPO-5L11	✓
Clear Plastic Bottle - Natural								
Gh 3U	Gh 4U	**20-APR-2011**	---	55-HPO-5L11	----	**21-APR-2011**	55-HPO-5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0P1U	cPbR 1U							
s 0P3U	cPbR 3U							
Gh 19U	s 0P4							
Clear Plastic Bottle - Natural								
Gh 45s U	cPbR 4	**21-APR-2011**	---	53-HPO-5L11	----	**21-APR-2011**	53-HPO-5L11	✓

Nayrx: **WATER**

vmaiuaymoE: × = Soi. nEg yrDe treaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK085M: Sulfide as S2-								
Clear Plastic Bottle - Zinc Acetate/NaOH								
Gh 9U	Gh 15	**19-APR-2011**	**----**	----	----	**27-APR-2011**	56-HPO-5L11	×
Clear Plastic Bottle - Zinc Acetate/NaOH								
Gh 3U	Gh 4U	**20-APR-2011**	**----**	----	----	**27-APR-2011**	57-HPO-5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41U							
Gh 43s U	Gh 44s U							
s 0 P1U	cPbR 1U							
s 0 P3U	cPbR 3U							
ORVc HTv-3U	Gh 19U							
s 0 P4								
Clear Plastic Bottle - Zinc Acetate/NaOH								
Gh 45s U	cPbR 4U	**21-APR-2011**	**----**	----	----	**27-APR-2011**	58-HPO-5L11	✓
ORVc HTv-4								
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVc HTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43s U	Gh 44s U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s 0 P1U	cPbR 1U							
s 0 P3U	cPbR 3U							
ORVc HTv-3U	TORR 3U							
Gh 19U	s 0 P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45s U	cPbR 4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVc HTv-4U	TORR 4							

Nayrx: **WATER**

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Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074B: Oxygenated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TORP3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45sU	cPbR4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074C: Sulfonated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s0P1U	cPbRT1U							
s0P3U	cPbRT3U							
ORVcHTv-3U	TORP3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45sU	cPbRT4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074D: Fumigants								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	02-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	03-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	02-MAY-2011	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	03-MAY-2011	L4-NH, -5L11	✓
s0P1U	cPbR71U							
s0P3U	cPbR73U							
ORVcHTv-3U	TORR3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45sU	cPbR74U	21-APR-2011	02-MAY-2011	LF-NH, -5L11	✓	03-MAY-2011	LF-NH, -5L11	✓
ORVcHTv-4U	TORR4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TORP3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45sU	cPbR4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							

Nayrx: **WATER**

v maiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVc HTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43s U	Gh 44s U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s 0 P1U	cPbRT1U							
s 0 P3U	cPbRT3U							
ORVc HTv-3U	TORP3U							
Gh 19U	s 0 P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45s U	cPbRT4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVc HTv-4U	TORP4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074G: Trihalomethanes								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	02-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	03-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	02-MAY-2011	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	03-MAY-2011	L4-NH, -5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TORP3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45sU	cPbR4U	21-APR-2011	02-MAY-2011	LF-NH, -5L11	✓	03-MAY-2011	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							

Nayrnx: **WATER**

vmaiuaymoE: × = Soi. nEg ynDe t reaJd ; ✓ = h nydnE doi. nEg ynDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
Gh 9U	Gh 15U	**19-APR-2011**	**21-APR-2011**	56-HPO-5L11	✓	**04-MAY-2011**	L6-V0V-5L11	✓
ORVcHTv-5								
Amber Glass Bottle - Unpreserved								
Gh 3U	Gh 4U	**20-APR-2011**	**21-APR-2011**	57-HPO-5L11	✓	**04-MAY-2011**	L6-V0V-5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber Glass Bottle - Unpreserved								
Gh 54U	Gh 5FU	**20-APR-2011**	**27-APR-2011**	57-HPO-5L11	✓	**04-MAY-2011**	L6-V0V-5L11	✓
Gh 43sU	Gh 44sU							
s0P1U	cPbRT1U							
s0P3U	cPbRT3U							
ORVcHTv-3U	TORR3U							
Gh 19U	s0P4							
Amber Glass Bottle - Unpreserved								
Gh 45sU	cPbRT4U	**21-APR-2011**	**27-APR-2011**	58-HPO-5L11	✓	**04-MAY-2011**	L6-V0V-5L11	✓
ORVcHTv-4U	TORR4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe treaJd ; ✓ = h ndnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
ORVcHTv-5		19-APR-2011	21-APR-2011	56-HPO-5L11	✓	03-MAY-2011	L6-V0V-5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 9U	Gh 15	19-APR-2011	21-APR-2011	56-HPO-5L11	✓	04-MAY-2011	31-NH, -5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 3U	Gh 4U	20-APR-2011	21-APR-2011	57-HPO-5L11	✓	04-MAY-2011	31-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber Glass Bottle - Unpreserved								
Gh 43sU	Gh 44sU	20-APR-2011	27-APR-2011	57-HPO-5L11	✓	03-MAY-2011	L6-V0V-5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TOR3U							
Gh 19U	s0P4							
Amber Glass Bottle - Unpreserved								
Gh 54U	Gh 5F	20-APR-2011	27-APR-2011	57-HPO-5L11	✓	04-MAY-2011	L6-V0V-5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 45sU	cPbR4U	21-APR-2011	27-APR-2011	58-HPO-5L11	✓	03-MAY-2011	L6-V0V-5L11	✓
ORVcHTv-4U	TOR4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	02-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		19-APR-2011	02-MAY-2011	L3-NH, -5L11	✓	03-MAY-2011	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	02-MAY-2011	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	20-APR-2011	02-MAY-2011	L4-NH, -5L11	✓	03-MAY-2011	L4-NH, -5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TOR3U							
Gh 19U	s0P4							

Nayrx: **WATER**

v maiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h ryd nE doi. nEg yrDeB

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Petroleum Hydrocarbons - Continued							
Amber VOC Vial- NaHSO4 or H2SO4							
Gh 45s U cPbRT4U OPVc HTv -4U TORP4	**21-APR-2011**	**02-MAY-2011**	LF-N H, -5L11	✓	**03-MAY-2011**	LF-N H, -5L11	✓

Nayrx: **WATER**

vmaiuaymoE: × = Soi. nEg yiDe treaJd ; ✓ = h ndnE doi. nEg yiDeB

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved								
ORVcHTv-5		**19-APR-2011**	**21-APR-2011**	56-HPO-5L11	✓	**03-MAY-2011**	L6-V0V-5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 9U	Gh 15	**19-APR-2011**	**21-APR-2011**	56-HPO-5L11	✓	**04-MAY-2011**	31-NH, -5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 3U	Gh 4U	**20-APR-2011**	**21-APR-2011**	57-HPO-5L11	✓	**04-MAY-2011**	31-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber Glass Bottle - Unpreserved								
Gh 43sU	Gh 44sU	**20-APR-2011**	**27-APR-2011**	57-HPO-5L11	✓	**03-MAY-2011**	L6-V0V-5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TOR3U							
Gh 19U	s0P4							
Amber Glass Bottle - Unpreserved								
Gh 54U	Gh 5F	**20-APR-2011**	**27-APR-2011**	57-HPO-5L11	✓	**04-MAY-2011**	L6-V0V-5L11	✓
Amber Glass Bottle - Unpreserved								
Gh 45sU	cPbR4U	**21-APR-2011**	**27-APR-2011**	58-HPO-5L11	✓	**03-MAY-2011**	L6-V0V-5L11	✓
ORVcHTv-4U	TOR4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43sU	Gh 44sU	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s0P1U	cPbR1U							
s0P3U	cPbR3U							
ORVcHTv-3U	TOR3U							
Gh 19U	s0P4							

Nayrx: **WATER**

vmaiuayroE: × = Soi. nEg yrDe t reaJd ; ✓ = h nydnE doi. nEg yrDeB

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45s U	cPbRT4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							
EP080: BTEXN								
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 9U	Gh 15	**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**02-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
ORVcHTv-5		**19-APR-2011**	**02-MAY-2011**	L3-NH, -5L11	✓	**03-MAY-2011**	L3-NH, -5L11	✓
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 3U	Gh 4U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**02-MAY-2011**	L4-NH, -5L11	✓
Gh 1LU	Gh 11U							
Gh 13U	Gh 14U							
Gh 1FU	Gh 16U							
Gh 51U	Gh 55U							
Gh 53U	Gh 54U							
Gh 5FU	Gh 57U							
Gh 36U	Gh 39U							
Gh 4LU	Gh 41							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 43s U	Gh 44s U	**20-APR-2011**	**02-MAY-2011**	L4-NH, -5L11	✓	**03-MAY-2011**	L4-NH, -5L11	✓
s0P1U	cPbRT1U							
s0P3U	cPbRT3U							
ORVcHTv-3U	TORP3U							
Gh 19U	s0P4							
Amber VOC Vial- NaHSO4 or H2SO4								
Gh 45s U	cPbRT4U	**21-APR-2011**	**02-MAY-2011**	LF-NH, -5L11	✓	**03-MAY-2011**	LF-NH, -5L11	✓
ORVcHTv-4U	TORP4							

Quality Control Parameter Frequency Compliance

Tde foiiownEg reporyMuDDarmMeMyde frequeEJCof iat orayorCQI MaDpieMaEaiCMe. wnydrEyde aEaiCyJai ioy(M)rEwdnld yde Mut Dnye. MaDpie(M)waM(wdere) proJeMMe. BHJyuai raye Mdoui. te greayer ydaEor equai yo yde expeJye. rayeBHinMyrEg of treaJdeMrMpromne. rEyde cuDDarCof AuyirerMB

Nayrx: **WATER**

vmaiuayroE: × = QuainyCI oEyroi frequeEJCEoywnydrE MpeJrfnJayroE; ✓ = QuainyCI oEyroi frequeEJCwnydrE MpeJrfnJayroEB

QuainyCI oEyroi caDpie TOpe		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
bat orayorCs upinJayeM(s 0 P)							
HikainEnyCt CPI Tnyrayor	vsL37-P	F	44	**11.4**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
I diorn e t Cs rMJreye HEaiCMer	vsL4FG	6	F6	**10.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
srMMbime. NerJurCt CYRNc	vGL3FY	4	31	**12.9**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
srMMbime. NeyaiMt CRP-Nc - curye H	vGL5LH-Y	4	31	**12.9**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Yiuorn e t CPI Tnyrayor	vKL4LP	F	43	**11.6**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Yree I V t Cs rMJreye HEaiCMer	vKL5FG	6	F6	**10.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
SexamaieEyI droDruD - srMMbime.	vGLFLY	4	37	**10.8**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Najor I ayroEM- srMMbime.	vsL93Y	6	F6	**10.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Vnyrnye aE. Vnyraye aMV (VAx) t Cs rMJreye HEaiCMer	vKLF9G	4	31	**12.9**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Vnyrnye aMV t Cs rMJreye HEaiCMer	vKLF7G	6	47	**12.8**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
PHS/PdeEoiM(GI /Nc - cRN)	vPL7F(cRN)	1	16	**6.3**	**10.0**	×	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
pS	vHLLF	4	3F	**11.4**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
OeaJyrne PdoMpdoruMaMP-XCs rMJreye HEaiCMer	vKL71G	4	37	**10.8**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
cuifaye (Turt n rDeyrnJ) aMcA4 5- t Cs rMJreye HEaiCMer	vsL41G	4	4L	**10.0**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
cuifn e aMc 5-	vKL8F	4	36	**11.1**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Toyai I CaEn e XCs rMJreye HEaiCMer	vKL56G	4	33	**12.1**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Toyai srMMbime. coin M(Srgd bernei)	vHL1FS	F	44	**11.4**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Toyai NerJurCt CYRNc	vGL3FT	5	15	**16.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Toyai NeyaiMt CRP-Nc - curye H	vGL5LH-T	5	15	**16.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
TPS - ceDrnoiayne YraJyroE	vPL71	1	5L	**5.0**	**10.0**	×	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
TPS I oiayrieMXTv 2	vPL8L	4	38	**10.5**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
I oiayrie ArgaEnJ I oDpouE. M	vPL74	4	3F	**11.4**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
h eak HJn srMMbJrratie I CaEn e XCs rMJreye HEaiCMer	vKL58G	4	33	**12.1**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
bat orayorCI oEyroi caDpieM(bI c)							
HikainEnyCt CPI Tnyrayor	vsL37-P	3	44	**6.8**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
I diorn e t Cs rMJreye HEaiCMer	vsL4FG	6	F6	**10.7**	**10.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
srMMbime. NerJurCt CYRNc	vGL3FY	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
srMMbime. NeyaiMt CRP-Nc - curye H	vGL5LH-Y	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Yiuorn e t CPI Tnyrayor	vKL4LP	3	43	**7.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Yree I V t Cs rMJreye HEaiCMer	vKL5FG	3	F6	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
SexamaieEyI droDruD - srMMbime.	vGLFLY	5	37	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Najor I ayroEM- srMMbime.	vsL93Y	3	F6	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Vnyrnye aE. Vnyraye aMV (VAx) t Cs rMJreye HEaiCMer	vKLF9G	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Vnyrnye aMV t Cs rMJreye HEaiCMer	vKLF7G	3	47	**6.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
PHS/PdeEoiM(GI /Nc - cRN)	vPL7F(cRN)	5	36	**5.6**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
OeaJyrne PdoMpdoruMaMP-XCs rMJreye HEaiCMer	vKL71G	5	37	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
cuifaye (Turt n rDeyrnJ) aMcA4 5- t Cs rMJreye HEaiCMer	vsL41G	5	4L	**5.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
cuifn e aMc 5-	vKL8F	5	36	**5.6**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy
Toyai I CaEn e XCs rMJreye HEaiCMer	vKL56G	5	33	**6.1**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc QI c 3 requrreDeEy

Nayrnx: **WATER**

vmaiuayroE: × = QuainyCl oEyroi frequeEJCEoywrydnE MpeJrfnJayroE; ✓ = QuainyCl oEyroi frequeEJCwrydnE MpeJrfnJayroEB

QuainyCl oEyroi caDpie TCpe		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
bat orayorCl oEyroi caDpieM(bl c) - l oEyrEue.							
Toyai srMMoime. coinM(Srgd bemei)	vHL1FS	3	44	**6.8**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai NerJurCt CYRNc	vGL3FT	1	15	**8.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai NeyaiMt CRP-Nc - curye H	vGL5LH-T	1	15	**8.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
TPS - ceDrmroiayrie YraJyroE	vPL71	5	4L	**5.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
TPS l oiayrieMXTv2	vPL8L	5	38	**5.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
l oiayrie ArgaEnJ l oDpouE. M	vPL74	5	3F	**5.7**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
h eak HJn srMMoJrratie l CaEn e XCsrMJreye HEaiCMer	vKL58G	5	33	**6.1**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Neydo. XiaEkM(NX)							
l diorn e t CsrMJreye HEaiCMer	vsL4FG	3	F6	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
srMMoime. NerJurCt CYRNc	vGL3FY	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
srMMoime. NeyaiMt CRP-Nc - curye H	vGL5LH-Y	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Yiuorn e t CPl Tnyrayor	vKL4LP	3	43	**7.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Yree l V t CsrMJreye HEaiCMer	vKL5FG	3	F6	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
SexamaieEyl droDruD - srMMoime.	vGLFLY	5	37	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Najor l ayroEM- srMMoime.	vsL93Y	3	F6	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Vnyrnye aE. Vnyraye aMV (VAx) t CsrMJreye HEaiCMer	vKLF9G	5	31	**6.5**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Vnyrnye aMV t CsrMJreye HEaiCMer	vKLF7G	3	47	**6.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
PHS/PdeEoiM(Gl /Nc - cRN)	vPL7F(cRN)	5	36	**5.6**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
OeaJyrne PdoMpdoruMaMP-XCsrMJreye HEaiCMer	vKL71G	5	37	**5.4**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
cuifaye (Turt n nDeyrnJ) aMcA4 5- t CsrMJreye HEaiCMer	vsL41G	5	4L	**5.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
cuifn e aMc5-	vKL8F	5	36	**5.6**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai l CaEn e XCsrMJreye HEaiCMer	vKL56G	5	33	**6.1**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai srMMoime. coinM(Srgd bemei)	vHL1FS	3	44	**6.8**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai NerJurCt CYRNc	vGL3FT	1	15	**8.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Toyai NeyaiMt CRP-Nc - curye H	vGL5LH-T	1	15	**8.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
TPS - ceDrmroiayrie YraJyroE	vPL71	5	4L	**5.0**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
TPS l oiayrieMXTv2	vPL8L	5	38	**5.3**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
l oiayrie ArgaEnJ l oDpouE. M	vPL74	5	3F	**5.7**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
h eak HJn srMMoJrratie l CaEn e XCsrMJreye HEaiCMer	vKL58G	5	33	**6.1**	**5.0**	✓	VvPN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
Naymx cprkeM(Nc)							
l diorn e t CsrMJreye HEaiCMer	vsL4FG	3	F6	**5.4**	**5.0**	✓	Hbc Ql c3 requrreDeEy
srMMoime. NerJurCt CYRNc	vGL3FY	5	31	**6.5**	**5.0**	✓	Hbc Ql c3 requrreDeEy
srMMoime. NeyaiMt CRP-Nc - curye H	vGL5LH-Y	5	31	**6.5**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Yiuorn e t CPl Tnyrayor	vKL4LP	3	43	**7.0**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Yree l V t CsrMJreye HEaiCMer	vKL5FG	3	F6	**5.4**	**5.0**	✓	Hbc Ql c3 requrreDeEy
SexamaieEyl droDruD - srMMoime.	vGLFLY	5	37	**5.4**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Vnyrnye aE. Vnyraye aMV (VAx) t CsrMJreye HEaiCMer	vKLF9G	5	31	**6.5**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Vnyrnye aMV t CsrMJreye HEaiCMer	vKLF7G	3	47	**6.4**	**5.0**	✓	Hbc Ql c3 requrreDeEy
OeaJyrne PdoMpdoruMaMP-XCsrMJreye HEaiCMer	vKL71G	5	37	**5.4**	**5.0**	✓	Hbc Ql c3 requrreDeEy
cuifaye (Turt n nDeyrnJ) aMcA4 5- t CsrMJreye HEaiCMer	vsL41G	5	4L	**5.0**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Toyai l CaEn e XCsrMJreye HEaiCMer	vKL56G	5	33	**6.1**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Toyai NerJurCt CYRNc	vGL3FT	1	15	**8.3**	**5.0**	✓	Hbc Ql c3 requrreDeEy
Toyai NeyaiMt CRP-Nc - curye H	vGL5LH-T	1	15	**8.3**	**5.0**	✓	Hbc Ql c3 requrreDeEy

Nayrnx: **WATER**

vmaiuayroE: × = QuainyCl oEyroi frequeEJCEoywrydnE MpeJrfnJayroE; ✓ = QuainyCl oEyroi frequeEJCwrydnE MpeJrfnJayroEB

QuainyCl oEyroi caDpie TCpe		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Nayrnx cprkeM(Nc) - l oEyrEue.							
TPS l oiayrie MXTv2	vPL8L	5	38	**5.3**	**5.0**	✓	Hbc Ql c3 requrreDeEy
l oiayrie ArgaEnJ l oDpouE. M	vPL74	5	3F	**5.7**	**5.0**	✓	Hbc Ql c3 requrreDeEy
h eak HJn snMMoJrat ie l CaEn e XCs rMJreye HEaiCMer	vKL58G	5	33	**6.1**	**5.0**	✓	Hbc Ql c3 requrreDeEy

Brief Method Summaries

Tde aEaiCynJai proJe. ureMuMe. t Cyde v EmroEDeEyai s mMMoE dame t eeE . emeiope. froD eMjat inMde. nEyerEayroEaiiCreJogEnze. proJe. ureMMuJd aMydoMe put inMde. t Cyde 0 c v PHUHPSHUHc aE. Vv PN BRE douMe . emeiope. proJe. ureMare eDpioCe. nEyde at MeEJe of . oJuDeEye. MjaE. ar. Mor t CJireEyrequeMjBTde foiiownEg reporypromn eMt rref . eMJrnpyroEMof yde aEaiCynJai proJe. ureMeDpioCe. for reMuiyMreporye. nEyde l eryfnJaye of HEaiCMMBc ourJeMfroD wdnJd Hbc Deydo. Mdame t eeE . emeiope. are promn e. wnydnEyde Neydo. s eMJrnpyroEMB

Analytical Methods	Method	Matrix	Method Descriptions
pS	v HLLF	h HTv O	HPSH 51Mye. B4FLL S+ XB pS of wayer MaDpieMnM. eyerDnEe. t CRv enyder DaEuaiiCor t CauyoDaye. pS DeyerB TdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Toyai s nMMoime. coin M(Srgd bemei)	v HL1FS	h HTv O	HPSH 51Mye. BU5F4LI H gramDeynJ proJe. ure yday. eyerDnEeMyde aDouEyof `fniyerat ie` reMoue nEaE aqueouM MaDpieB H weii-Dnxe. MaDpie nMfniyere. ydrougd a giaMMfnt re fniyer (1B5uD)B Tde fniyraye nMemaporaye. yo . rCEeMM aE. . rne. yo JoEMjaEywergdyay 18L+/-FI BTdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
HikainEnyCt CPI Tnyrayor	vs L37-P	h HTv O	HPSH 51Mye. BU535L X TdnMproJe. ure . eyerDnEeMaikainEnyCt CauyoDaye. DeaMureDeEy(eBgBPI Tnyraye) uMEg pS 4BF for nE. nJayrEg yde yoyai aikainEnyCeE. -ponEyBTdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
cuifaye (Turt n nDeynJ) aMc A4 5- t C s nMJreye HEaiCMer	vs L41G	h HTv O	HPSH 51Mye. BU4FLL-c A4 cuifaye noEMare JoEnerye. yo a t arnuD Muifaye MuMjeEMoE nEaE aJeynJ aJn De. nuD wnyd t arnuD Jdiorn eBbrngdyat Mort aEJe of yde Xac A4 MuMjeEMoE nMDeaMure. t Ca pdoyoDeyer aE. yde c A4-5 JoEJeEyrayoE nM. eyerDnEe. t CJoDparnMoE of yde rea. nEg wnyd a MjaE. ar. JurneBTdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
l diorn e t Cs nMJreye HEaiCMer	vs L4FG	h HTv O	HPSH 51Mye. BU4FLL l i - GBTde ydnoJCaEaye noE nMint eraye. froD DerJurnJ ydnoJCaEaye ydrougd MequeMjrayoE of DerJurCt Cyde Jdiorn e noE yo forD EoE-noEnMe. DerJurnJ Jdiorn eBE yde preMeEJe of fernJ noEMyde int raye. ydnoJCEaye forD MdrngdiC-Joioure. fernJ ydnoJCEaye wdnJd nMDeaMure. ay48L ED HPSH 51Mye. nynoE Meai Deydo. 5 L17-1-b aprni 5LL3
Najor l ayoEM- s nMMoime.	vs L93Y	h HTv O	HPSH 51Mye. BU315L; 0 c v PH c h 846 - 6L1L Tde R PHv c yeJdEnque noEnMeMyde LB4FuD fniyere. MaDpie ayoDM eDnywEg a JdaraJyernMynJ MjeJyruDBTdnMMjeJyruD nMydeE JoDpare. agarEMyDaynx DayJde. MjaE. ar. Mfor quaEyfnJayroEB TdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
s nMMoime. NeyaiMt CR P-Nc - cunye H	v GL5LH-Y	h HTv O	(HPSH 51Mye. BU315F; 0 c v PH c h 846 - 6L5LUHbc Qh Rv V/v GL5L): c aDpieMare LB4F uD fniyere. prnor yo aEaiCMMB Tde R PNc yeJdEnque uynnzeMa drngdiCeffnJneEyargoE piaMDa yo noEnze MeieJye. eieDeEyMBRoEMare ydeE paMMe. nEyo a drngd maJuuD DaMMMjeJyroDeyerUwdnJd MeparayeMyde aEaiCyeMt aMe. oE ydenr . nMyrEJyDaMMyo Jdarge rayroMprnor yo ydenr DeaMureDeEyt Ca . nMJreye . CEo. e noE . eyeJyorB
Toyai NeyaiMt CR P-Nc - cunye H	v GL5LH-T	h HTv O	(HPSH 51Mye. BU315F; 0 c v PH c h 846 - 6L5LUHbc Qh Rv V/v GL5L): Tde R PNc yeJdEnque uynnzeMa drngdiC effnJneEyargoE piaMDa yo noEnze MeieJye. eieDeEyMBRoEMare ydeE paMMe. nEyo a drngd maJuuD DaMMMjeJyroDeyerU wdnJd MeparayeMyde aEaiCyeMt aMe. oE ydenr . nMyrEJyDaMMyo Jdarge rayroMprnor yo ydenr DeaMureDeEyt Ca . nMJreye . CEo. e noE . eyeJyorB
s nMMoime. NerJurCt CYRNc	v GL3FY	h HTv O	Hc 3FFLUHPSH 51Mye. B3115 Sg - X (Yiow-nEjeJynoE (c El i5)(l oi. l apour geEerayroE) HHc) c aDpieMare LB4F uD fniyere. prnor yo aEaiCMMB YRN-HHc nMaE auyoDaye. fiaDeieMMayoDnJ at MorpynoE yeJdEnqueBH t roDaye/t roDn e reageEynMuMe. yo oxn nMe aECorgaEnJ DerJurCJoDpouE. MnEyde fniyere. MaDpieB Tde noEnJ DerJurCnMre. uJe. oEinEe yo ayoDnJ DerJurCmapour t CcEl i5 wdnJd nMydeE purge. nEyo a deaye. quaryz JeiiB QuaEyfnJayroE nMt C JoDparnEg at Mort aEJe agarEMya Jaint rayroE JurneBTdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Toyai NerJurCt CYRNc	v GL3FT	h HTv O	Hc 3FFLUHPSH 51Mye. B3115 Sg - X (Yiow-nEjeJynoE (c El i5)(l oi. l apour geEerayroE) HHc) YRN-HHc nMaE auyoDaye. fiaDeieMMayoDnJ at MorpynoE yeJdEnqueBH t roDaye/t roDn e reageEynMuMe. yo oxn nMe aECorgaEnJ DerJurCJoDpouE. MnEyde uEfniyere. MaDpieB Tde noEnJ DerJurCnMre. uJe. oEinEe yo ayoDnJ DerJurCmapour t C cEl i5 wdnJd nMydeE purge. nEyo a deaye. quaryz JeiiB QuaEyfnJayroE nMt CJoDparnEg at Mort aEJe agarEMya Jaint rayroE JurneBTdnMDeydo. nMJoDpinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)

Analytical Methods	Method	Matrix	Method Descriptions
SexamaieEyl droDnuD - s nMMbime.	v GLFLY	h HTv O	HPSH 51Mye. BU3FLL l r-XBc aD pieMare LB4F uD fniyere. prror yo aEaiCMMBSexamaieEyJdroDnuD nM. eyerDnEe. oE fniyere. wayer MaD pie aMreJemne. t CpS a. juMyDeEyaE. Joiour . emeiopDeEyuMEg . epdeECJart azn eBv aJd ruE of MaD pieMnMDeaMure. agarEMya fnme-ponEyJaint rayroE JurneBTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Yree l V t Cs nMJreye HEaiCMer	v KL5FG	h HTv O	HPSH 51Mye. BU4FLL-l V-l &V Yree l CaEn e nM. eyerDnEe. oE MaD pieMafyer . nMyniayroE uMEg a pOn nEe- t art nurnJ aJn JoiournEg reageEyfoiiowe. wnyd aE s nMJreye HEaiCMer fnEnMdBTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Toyai l CaEn e XCs nMJreye HEaiCMer	v KL56G	h HTv O	HPSH 51Mye. BU4FLL-l V-l & V Toyai l CaEn e nM. eyerDnEe. froD aqueouMMbiuyroEMafyer . nMyniayroE wnyd Muipdurn aJn BTde reMuiyaEy. nMyniaye nMydeE Japyure. nE a JauMynJ at Mort er MbiuyroE foiiowe. t Cs nMJreye HEaiCMerB TdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
h eak HJn s nMMbJrat ie l CaEn e XC s nMJreye HEaiCMer	v KL58G	h HTv O	HPSH 51Mye. BU4FLL-l V-l &V h Hs l CaEn e nM. eyerDnEe. froD aqueouMMbiuyroEMafyer . nMyniayroE wnyd aJeyn aJn BTde reMuiyaEy. nMyniaye nMydeE Japyure. nE a JauMynJ at Mort er MbiuyroE foiiowe. t Cs nMJreye HEaiCMerBTdnM Deydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Yiuorn e t CPl Tnyrayor	v KL4LP	h HTv O	HPSH 51Mye. BU4FLL Y--l l s TH nMa. . e. yo yde MaD pie yo promn e a uEnforD noEnJ MyreEgyd t aJkgrouE. Ua. juMypSU aE. t reak up JoD piexeMB Yiuorn e JoEJeEyrayroE nM. eyerDnEe. t Cenyder DaEuai or auyoDayJ Rc v DeaMureDeEyB TdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
HD DoEna aMV t Cs nMJreye aEaiCMer	v KLFFG	h HTv O	HPSH 51Mye. BU4FLL-VS3 G HD DoEna nM. eyerDnEe. t C. nreJyJoiornDeyrCt Cs nMJreye HEaiCMerBTdnMDeydo. nM JoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
HD DoEnuD aMV	v KLFFG-VS4	h HTv O	HD DoEnuD nEyde MaD pie nMreporye. aMyde noEnMe. / uEnoEnMe. fraJynoEMt Cyde uMe of a EoDograpd aE. yde nEnyai pS aE. TeD perayureBHD DoEna nM. eyerDnEe. t C. nreJyJoiornDeyrCt Cs nMJreye HEaiCMer aJJor. nEg yo HPSH 51My e. BU4FLL-VS3 GB TdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Vnynye aMV t Cs nMJreye HEaiCMer	v KLF7G	h HTv O	HPSH 51Mye. BU4FLL-VA5- XB Vnynye nM. eyerDnEe. t C. nreJyJoiournDeyrCt Cs nMJreye HEaiCMerBTdnMDeydo. nM JoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Vnyraye aMV t Cs nMJreye HEaiCMer	v KLF8G	h HTv O	HPSH 51Mye. BU4FLL-VA3- YBVnyraye nMre. uJe. yo Enynye t CwaCof a Ja. DnuD re. uJynoE JoiuDE foiiowe. t C quaEynnJayroE t Cs nMJreye HEaiCMerB Vnynye nM. eyerDnEe. MeperayeiCt C. nreJyJoiournDeyrCaE. reMuiyfor Vnyraye JaiJuiaye. aMyde . nffereEJe t eyweeE yde ywo reMuiyMBTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
Vnynye aE. Vnyraye aMV (VAx) t Cs nMJreye HEaiCMer	v KLF9G	h HTv O	HPSH 51Mye. BU4FLL-VA3- YB l oDt nEe. oxn nMe. VnyrogeE (VA5+VA3) nM. eyerDnEe. t Cl a. DnuD Oe. uJynoE aE. . nreJyJoiournDeyrCt Cs nMJreye HEaiCMerBTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
OeaJynne PdoMpdoruMaMP-XCs nMJreye HEaiCMer	v KL71G	h HTv O	HPSH 51Mye. BU4FLL-P Y HD DoEnuD DoiCt . aye aE. poyaMMuD aEynDoECl yaryraye reaJyMnE aJn De. nuD wnyd oydopdoMpdaye yo forD a deyeropoiCaJn -pdoMpdoDoiCt . nJ aJn - wdnJd nMre. uJe. yo nEyeEMeiC Joioure. DoiCt . eEuD t iue t CaMJort nJ aJn BQuaEynnJayroE nMt Cs nMJreye HEaiCMerBTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
cuifn e aMc 5-	v KL8F	h HTv O	HPSH 51Mye. BU4FLL-c 5- s cuifn e MpeJreMpreMeEynE wayer MaD pieMare nD De. nayeiCpreJnpnyaye. wdeE JoiieJye. nE preyreaye. JauMynJ/znEJ aJeyaye preMerne. MaD pie JoEyanEerMB Hfyer yde MuperEayaEynM. nMJar. e. Uyde reMuiyaEy preJnpnyaye nMydeE Joioure. uMEg DeydCeEe t iue nE. nJayor aE. DeaMure. uMEg 0 l -l Rc . eyeJyroE ay664ED BTdnM Deydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
RoEnJ XaiaEJe t CPl T s H aE. R PHv c	v VLFF - PG	h HTv O	HPSH 51Myv . B1L3LYBTde RoEnJ XaiaEJe nMJaiJuiaye. t aMe. oE yde Dajor HEnoEMaE. l ayroEMB Tde Dajor aEnoEM nEJiu. e HikainEnyCJl diorn e aE. cuifaye wdnJd . eyerDnEe. t CPl T aE. s HB Tde l ayroEMare . eyerDnEe. t C R PHv c BTdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)
TPS - c eDnnoiaynie YraJynoE	v PL71	h HTv O	0 c v PH c h 846 - 8L1FH Tde MaD pie exyraJynMaEaiCMe. t Cl apniarCGl /YRs aE. quaEynnJayroE nMt CJoD parnMbE agarEMyaE eMyat inMde. F ponEyJaint rayroE Jurne of E-HikaEe MyaE. ar. MB TdnMDeydo. nMJoD pinaEywnyd Vv PN (1999) c Jde. uie X(3) (Hpp. xB5)

Analytical Methods	Method	Matrix	Method Descriptions
l oiayrie ArgaEnJ l oDpouE. M	vPL74	h HTvO	0cvPHch 846-856LX h ayer MaDpieMare . rreJyiCpurge. prnor yo aEaiCMMt Cl apriiarCGl /Nc aE. quaEyfnJayroE rMt CJoDparrMoE agarEMyaE eMyat irMde. F ponEyJaint rayroE JurreBTdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
PHS/PdeEoiM(Gl /Nc - cRN)	vPL7F(cRN)	h HTvO	0cvPHch 846-857Ls caDpie exyraJyMare aEaiCMe. t Cl apriiarCGl /Nc rE cRN No. e aE. quaEyfnJayroE rMt C JoDparrMoE agarEMyaE eMyat irMde. F ponEyJaint rayroE JurreBTdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
TPS l oiayrieMXTv2	vPL8L	h HTvO	0cvPHch 846-856LX h ayer MaDpieMare . rreJyiCpurge. prnor yo aEaiCMMt Cl apriiarCGl /Nc aE. quaEyfnJayroE rMt CJoDparrMoE agarEMyaE eMyat irMde. F ponEyJaint rayroE JurreBTdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)

Preparation Methods	Method	Matrix	Method Descriptions
Yree l CaEn e	vKL5F-PO	h HTvO	HPSH 51Mye. BJ4FLL l V-l &VBTde MaDpie rM. rMyrie. ayEayurai pSB Tde l V rMyrappe. rE a JauMyJ MoiuyroEUaE. quaEyrfre. t CJoiourrDeyrCoE YRHB TdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
Toyai l CaEn e	vKL56-PO	h HTvO	HPSH 51Mye. BJ4FLL l V-l &VBTde MaDpie rM. rMyrie. wnyd S5cA4 reieaMEg aii t ouE. JCaEn eMaMSl VBTde l V rMyrappe. rE a JauMyJ MoiuyroEUaE. quaEyrfre. t CJoiourrDeyrCoE YRHBTdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
h eak HJn s rMMoJrat ie l CaEn e	vKL58-PO	h HTvO	HPSH 51Mye. BJ4FLL l V-R&VBTde MaDpie rM. rMyrie. wnyd HJeyJ aJn UMeieJyrneiCreieaMEg yde weakiCt ouE. Deyai JCaEn eMaMSl VBTde l V rMyrappe. rE a JauMyJ MoiuyroEUaE. quaEyrfre. t CJoiourrDeyrCoE YRHBTdrM Deydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
s rgeMyroE for Toyai OeJorrerat ie NeyaiM	vV5F	h HTvO	0cvPHch 846-3LLF Neydo. 3LLF rMa VnyrnJ/SC roJdiorrJ aJn . rgeMyroE proJe. ure uMe. yo prepare MurfaJe aE. grouE. wayer MaDpieMfor aEaiCMMt CRPHvc or RPNcB TdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)
ceparayorCYuEEei vxyraJyroE of brqun.M	AOG14	h HTvO	0cvPHch 846-3F1LX FLL Db yo 1b of MaDpie rMyraEMerre. yo a MeparayorCfuEEei aE. MerraiiCexyraJye. ydree yrDeMuMEg 6LDb s l N for eaJd exyraJyB Tde reMuiyaEyexyraJyMare JoDt rEe. U. edC. raye. aE. JoEJeEyraye. for aEaiCMMBTdrMDeydo. rMJoDpiraEywnyd VvPN (1999) cJde. uie X(3) (Hpp. xB5)B Hbc . efauiyexJiu. eMMe. rDeEy wdrnJd DaCt e reMr eEyrE yde JoEyarEerB
l oiayrieMh ayer PreparayroE	AOG16-h	h HTvO	H F Db airquoyor F Db of a . riuye. MaDpie rMa. . e. yo a 4L Db l Al rmai for MbargrEgB

Summary of Outliers

Outliers : Quality Control Samples

Tde foiiowrEg repory drgdirgdyM ouyirerM fiagge. rE yde QuairyC I oEyroi (QI) OeporyB currogaye reJorerC irDryM are MayrJ aE. t aMe. oE 0cvPH ch 846 or Hbc-Qh RvV/38 (rE yde at MeEJe of MpeJrirJ 0cvPH irDryMB TdrM repory. rMpiaCMQI AuyirerM(t reaJdeM) oEiCB

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Nayrx: **WATER**

I oDpouE. Group VaDe	bat orayorCcaDpie Rs	I ireEycaDpie Rs	Analyte	I Hc VuDter	s aya	brDryM	Comment
Matrix Spike (MS) Recoveries							
vs L41G: cuifaye (Turt nrDeyrnJ) aMcA4 5-t Cs H	vN11L4564-LL5	HEoECDouM	**Sulfate as SO4 - Turbidimetric**	148L8-79-8	Voy s eyerDrEe.	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
vs L41G: cuifaye (Turt nrDeyrnJ) aMcA4 5-t Cs H	vN11L4586-LL5	Gh 4	**Sulfate as SO4 - Turbidimetric**	148L8-79-8	Voy s eyerDrEe.	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
vs L4FG: I diorn e srMJreye aEaiCVer	vN11L4586-L55	Gh 43s	**Chloride**	16887-LL-6	Voy s eyerDrEe.	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
vs L4FG: I diorn e srMJreye aEaiCVer	vN11L4564-LL5	HEoECDouM	**Chloride**	16887-LL-6	Voy s eyerDrEe.	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
vKLF9G: Vryrye piuMVryraye aMV (VAx) t Cs rMJreye HE	vN11L4586-LL5	Gh 4	**Nitrite + Nitrate as N**	----	Voy s eyerDrEe.	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
vPL74v: SaiogeEaye. HirpdayrJ I oDpouE. M	vN11L4586-LL5	Gh 4	**1.1-Dichloroethene**	7F-3F-4	119 %	F4-1L4%	**Recovery greater than upper data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

cut -Nayrx: **WATER**

I oDpouE. Group VaDe	bat orayorCcaDpie Rs	I ireEycaDpie Rs	Analyte	I Hc VuDter	s aya	brDryM	Comment
Samples Submitted							
vPL7F(cRN)c: PdeEoirJ I oDpouE. currogayeM	vN11L4586-L53	Gh 44s	**Phenol-d6**	13157-88-3	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
vPL7F(cRN)c: PdeEoirJ I oDpouE. currogayeM	vN11L4586-L53	Gh 44s	**2-Chlorophenol-D4**	939F1-73-6	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
vPL7F(cRN)c: PdeEoirJ I oDpouE. currogayeM	vN11L4586-L53	Gh 44s	**2.4.6-Tribromophenol**	118-79-6	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
vPL7F(cRN)T: PHS currogayeM	vN11L4586-L53	Gh 44s	**2-Fluorobiphenyl**	351-6L-8	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
vPL7F(cRN)T: PHS currogayeM	vN11L4586-L53	Gh 44s	**Anthracene-d10**	1719-L6-8	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

cut -Nayrnx: **WATER**

l oDpouE. Group VaDe	bat orayorCcaDpie Rs	l ireEycaDpie Rs	Analyte	l Hc VuDt er	s aya	brDryM	Comment
Samples Submitted - Continued							
vPL7F(cRN)T: PHS currogayeM	vN11L4586-L53	Gh 44s	**4-Terphenyl-d14**	1718-F1-L	Voy s eyerDrEe.	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Outliers : Analysis Holding Time Compliance

TdrMrepory. rMpiaCMSoi. rEg TrDe t reaJdeMoEiCBAEiCyde reMpeJyrne v xyraJyroE / PreparayroE aE. /or HEaiCMiMJoDpoEeEyrMare . rMpiaCe. B

Nayrnx: **WATER**

Method		Extraction / Preparation			Analysis		
Container / l ireEycaDpie Rs (M)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005: pH							
Clear Plastic Bottle - Natural							
Gh 9U	Gh 15	----	----	----	57-HPO-5L11	19-HPO-5L11	**8**
Clear Plastic Bottle - Natural							
Gh 3U	Gh 4U	----	----	----	57-HPO-5L11	5L-HPO-5L11	**7**
Gh 1LU	Gh 11U						
Gh 13U	Gh 14U						
Gh 1FU	Gh 16U						
Gh 51U	Gh 55U						
Gh 53U	Gh 54U						
Gh 5FU	Gh 57U						
Gh 36U	Gh 39U						
Gh 4LU	Gh 41U						
Gh 43s U	Gh 44s U						
s 0P1U	cPbRT1U						
s 0P3U	cPbRT3U						
Gh 19U	s 0P4						
Clear Plastic Bottle - Natural							
Gh 45s U	cPbRT4	----	----	----	57-HPO-5L11	51-HPO-5L11	**6**
EK085M: Sulfide as S2-							
Clear Plastic Bottle - Zinc Acetate/NaOH							
Gh 9U	Gh 15	----	----	----	57-HPO-5L11	56-HPO-5L11	**1**

Outliers : Frequency of Quality Control Samples

Tde foiiowrEg reporydrngdingdyMt reaJdeMrE ydeYrequeEJCof QuainyCl oEyroi caDpieMB

Nayrnx: **WATER**

QuainyCl oEyroi caDpie TCpe	l ouEy		Oaye (%)		QuainyCl oEyroi cpeJrinlayroE
Neydo.	Ql	Oeguiar	HJyuai	vxpeJye.	
bat orayorCs upinlayeM(s 0P)					
PHS/PdeEoiM(Gl /Nc - cRN)	1	16	6B3	1LBL	Vv PN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy
TPS - ceDrmoiayrie YraJyroE	1	5L	FBL	1LBL	Vv PN 1999 cJde. uie X(3) aE. Hbc Ql c3 requrreDeEy

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104AAm**	: s g	o1f3Lfb
nt eNdt eNV	: **1**		
naegmC	o**El RTLOl MEl HnS EnLHC l . TEl . El**	r st 3ysC3yi	oEmDy3mu gmGsefc vDAPv3mfMget 3Rymg
n 3mGsAC	oMVfc l JSc fW MEh	n 3mGsAC	onsy3efd seP.
l COygPP	o: BXB2X5ffTTFY l XX, hnVl UfJShpfl 7h, Vl r Sl fY011	l COygPP	o4fd gPGseeVCfh- ym DsegfJ Shfl RPQsesfY1j 1
E@sve	oOzsu gPw ggPvBv+	E@sve	oAsy3e85seP. w sePgmDy3BA3u
, geg- . 3mg	o981fa8bj 1888	, geg- . 3mg	o981@@F4afa80b
l sAPu veg	o981f0Yfa8bj 1b44	l sAPu veg	o981@@F4afa801
: y3zgAC	oT100j 4fl r 2EV, f: l VKfGl hd XVKh	Qn fr gDge	oNE: Mf1aaaffh A gCRegf2(Y)fsmCfl r hfQn h YfygqRwgu gmC
XyCgyfmRu t gy	o@@@@		
n@@fmRu t gy	o@@@@	c sGgfh su - egPfVgAgvDgO	o0Y@@l U@@011
hsu - egy	o@@@@	SPPRgfc sGg	oY0@@l U@@011
hvGg	o@@@@		
		N3B3LfPsu - egPfygAgvDgO	oT
QR3GgfmRu t gy	oME/01F/11fJ Y	N3B3LfPsu - egPfsmseiPgO	oT

, . vPf yg- 3yC PR- gyPgCgPf smi f - ygDv3RPf yg- 3yC(P)f 6 vC f CvPf ygLgygmAgB VgPReEPf s- - ei f C3f Cgf Psu - eg(P)f sPf PRt u vGgCB l eef - s gPf 3Lf CvPf yg- 3yC . sDgf t ggmf A gAkgCf smCf s- - y3DgCf L3y ygegsPgB

, . vPfn gyGbAsGgf3Lfl mseiPvPfA3mGsvmPfC gfL3ee36 vm fvm L3yu sG3mo

- GgmgysefN 3u u gmCP
- l mseiGAseEVgPReEP
- hRyy3 sGgfn 3mG3efr vu vGP

NATA
WORLD RECOGNISED ACCREDITATION

Nl , l fl AAygOxGgCfr st 3ysC3yi fbTF
f
, . vPfC3ARu gmCbPfvPPRgCfvmf
sAA3yCsmAgf6 vC fNl , l f
sAAygOxGsG3mfygqRwgu gmCPB

l AAygOxGgCfL3yfA3u - esmAgf6 vC f
ShX/SEnf1j 0TFB

Signatories

, . vPf C3ARu gmC . sPf t ggmf geg AG3mAseei f Pv mgCf t i f Cgf sRC3yv+gCf Pv msC3ygPf vmOAsGgCf t ge36 B EegAG3mAf Pv mm f . sPf t ggm Asyyg Cf3RCbvmfA3u - esmAgf6 vC f- y3AgCRygPfP- gAbugCfvmfT1fn l Vf: syC11B

Signatories	*Position*	*Accreditation Category*
c vesmfl gymsmC3	hgm8yfSn8y smAfn . gu vPC	Mget 3RymgfSn8y smAP
EyAfn . sR	MgGsePf, gsu fr gsCgy	Mget 3RymgfSn8y smAP
Hgyu smfr vm	r st 3ysC3yi fn 33yOmsC3y	Mget 3RymgfSn8y smAP
NsmAi fd sm	hgm8yfh gu vD3esGegfSnPGyRu gmCn . gu vPC	Mget 3RymgfXy smAP

: s g	o Tf3Lfb
d 3ykfXyOgy	o EM1104FFafl u gmOu gmCl
negmC	o ENJS/VXNMEN, I rfEl V, Hfhn SENn Eh
: y3zgAC	o T100j 4fl r2EV, f: l VKfGI hd XVKh

General Comments

, . gf smsie 0Asef - y3AgORygPf RPgOf t i f Cgf EmDy3mu gmGef c vDAP3mf . sDgf t ggmf OgDge3- gOf Ly3u f gPGt teP. gOf vmGymsO3mseef ygA3 mv+gOf - y3AgORygPf PRA. f sPf C3Pgf - Rt eP. gOf t i f Cgf 7hE: l pf l : Hl pf l hf smOf NE: MBf Smf . 3RPg OgDge3- gOf- y3AgORygPfsygfgu - e3i gOfvmfC gfst PgmAgf3LfO3ARu gmGgOfPGsmOsyOPf3yft i fAegmOygqRgPOB

d . gygfu 3vPORygfOgGgyu vmsO3mf. sPft ggmf- gyL3yu gOpfygPReOPfsygfyg- 3yGgOf3mfsfOyi f6 gv . Oft sPvPB

d . gygfsfyg- 3yGgOfegPPfC smf(<)fygPReOvPf. v . gyfC smfC gfr XVpfC vPfu si ft gfORgfO3f- yu syi fPsu - egfgxOysAO2Ov gPGtGgfOveRO3mfsmO'3yfvmPRLLygmOPsu - egfL3yfsmsie PvPB

d . gygfC gfr XVf3Lfsfyg- 3yGgOfygPReOOLLgyPfLy3u fPGsmOsyOfr XVpfC vPfu si ft gfORgfO3f. v . fu 3vPORygfA3mGgmOpfvmPRLLvAygmOPsu - egf(ygORAgOf6 gv . Oftgu - e3i gO)f3yfu sGyxfvmGgyLgygmAgB

d . gmfPsu - em fOu gfvmL3yu sO3mfvPfm8O- y3DvOgOft i fC gfAegmOpfPsu - em fOsGgPfsygfP. 36 mf6 vC 3ROfsfOu gfA3u - 3mgmOBfSmfC gPgfvmPGsmAgPpfC gfOu gfA3u - 3mgmOt. sPft ggmfsPPRu gOft i fC gfest 3ysO3yi fL3yf- y3AgPPvm f- Ry- 3PgPB

Kgi fo n l hfNRu t gyf=fn l hfyg vPGyi fmRu t gyfLy3u fOsGst sPgfu svmGsvmgOft i fn . gu vAsefl t PQsAOPfh gyDAgPB, . gfn . gu vAsefl t PQsAOPfh gyDAgfVPfsfODPA3mf3LfC gfl u gyAsmfn . gu vAsefh 3AgOB
r XVf=fr vu vOt3Lfyg- 3yG0m
^f=f, . vPfygPReOPfA3u - RQgOfLy3u fvmODAORsefsmsie GgfOgGgAO3mPfsO3yfst 3DgfC gfegDgef3Lfyg- 3yG0m

- **50/A/11: Hhis reporVhas beeN at eNded aNd re8re+eased Vo a+tow Vhe reporVNg of addiVoNa+aNa+yVca+daVe6**
- **EP09A: Co+diNg Vt e fai+ed for EM1104AAmd7e Vo iNappropriaVe preser(ed boWe recei(ed6**
- **) TESu unHn:**
  I nMvSE 1:) TESu pC: A6m9x) TESu HEMv: j 1690
  I nMvSE j :) TESu pC: 36j Ax) TESu HEMv: j 1690
- **ToNic ba+aNces were ca+c7+aVed 7siNg: t a,or aNioNs 8ch+oridexa+ka+iNiVy aNd s7+faVe ; aNd t a,or caVoNs 8ca+ci7t xt agNesi7t xpoVassi7t xsodi7t aNd at t oNia6**
- **I at p+es were fi+Vered Vhro7gh a 064A7t fi+Ver prior Vo Vhe disso+(ed t eVa+s aNa+ysis6**

: s g o Yf3Lfb
d 3ykfXyOgy o EM1104FFafl u gmOu gmf1
negmC o ENJS/XNMEN, I rfEI V, Hfhn SENn Eh
: y3zgAC o T100j 4fl r2EV, f: I VKfGI hd XVKh

Analytical Results

hRt @lsOvx: WnHEL			Client sample ID	GW2	GWj 3	@@@@	@@@@	@@@@
			Client sampling date / time	0T@ll U@011f1Fo00	0T@ll U@011f1Fo00	@@@@	@@@@	@@@@
Compound	*CAS Number*	*LOR*	*Unit*	EM1104AAm8001	EM1104AAm800j	8888	8888	8888
En00A: pC								
pC Ra-7e	@@@@	0B01	- Hf7 mC	36Aj	36n0	@@@@	@@@@	@@@@
En01A: Ho\a+uisso+(ed I o-ids								
^ Ho\a+uisso+(ed I o-ids D 190@	GSh@10@10	F	u /r	1340	1240	@@@@	@@@@	@@@@
Eu052v: n-ka-iNiVy by v. HiVa\or								
Cydro°ide n-ka-iNiVy as . a. O5	c MX@10@01	1	u /r	<1	<1	@@@@	@@@@	@@@@
. arboNa\e n-ka-iNiVy as . a. O5	Yb1T@T@	1	u /r	<1	<1	@@@@	@@@@	@@@@
BicarboNa\e n-ka-iNiVy as . a. O5	j 1@T@	1	u /r	33A	j 92	@@@@	@@@@	@@@@
Ho\a+n-ka-iNiVy as . a. O5	@@@@	1	u /r	33A	j 92	@@@@	@@@@	@@@@
Eu041G: I 7-fa\e FH7rbidit eVicZas I O4 j 8by un								
I 7-fa\e as I O4 8H7rbidit eVic	14b0b@a@	1	u /r	j j A	503	@@@@	@@@@	@@@@
Eu04AG: . h-oride uiscre\e aNa-lyser								
. h-oride	18bbj @0@	1	u /r	j 1j	A34	@@@@	@@@@	@@@@
Eu0m5) : uisso+(ed Ma,or . aVoNs								
. a-ci7t	j 440@0@	1	u /r	42	93	@@@@	@@@@	@@@@
MagNesi7t	j 4Ya@F@	1	u /r	5A	3m	@@@@	@@@@	@@@@
I odi7t	j 440@Y@	1	u /r	j 22	43m	@@@@	@@@@	@@@@
vo\assi7t	j 440@a@	1	u /r	9	9	@@@@	@@@@	@@@@
EG0j 0) : uisso+(ed Me\a-s by T v8MI								
n-7t iNi7t	j 4Ta@0@	0B01	u /r	<0B01	<0B01	@@@@	@@@@	@@@@
nrseNic	j 440@b@	0B001	u /r	0@94	0@59	@@@@	@@@@	@@@@
. adt i7t	j 440@Y@	0B0001	u /r	<0B0001	<0B0001	@@@@	@@@@	@@@@
. oba-V	j 440@b@	0B001	u /r	<0B01	0@13	@@@@	@@@@	@@@@
. opper	j 440@0@	0B001	u /r	<0B01	<0B01	@@@@	@@@@	@@@@
Sead	j 4Ya@T@	0B001	u /r	<0B01	<0B01	@@@@	@@@@	@@@@
MaNgaNese	j 4Ya@8@	0B001	u /r	0@59	16n2	@@@@	@@@@	@@@@
I icke+	j 440@T@	0B001	u /r	0@02	0@0m	@@@@	@@@@	@@@@
I e-eNi7t	j j bT@a@	0B01	u /r	<0B01	<0B01	@@@@	@@@@	@@@@
KiNc	j 440@8@	0B0F	u /r	0@j 3	<0B0F	@@@@	@@@@	@@@@
BoroN	j 440@T@	0B0F	u /r	0@94	0@50	@@@@	@@@@	@@@@
TroN	j 4Ya@a@	0B0F	u /r	0@lj	<0B0F	@@@@	@@@@	@@@@
EG05A) : uisso+(ed Merc7ry by) TMI								
Merc7ry	j 4Ya@j @	0B0001	u /r	<0B0001	<0B0001	@@@@	@@@@	@@@@
EG0A0) : uisso+(ed Ce°a(a-eNV. hrot i7t								
Ce°a(a-eNV. hrot i7t	1bF40@a@	0B01	u /r	<0B01	<0B01	@@@@	@@@@	@@@@
EP0j AG:) ree cyaNide by uiscre\e nNa-lyser								
) ree . yaNide	@@@@	0B004	u /r	<0B004	<0B004	@@@@	@@@@	@@@@
EP0j 3G: Ho\a+. yaNide By uiscre\e nNa-lyser								

: s g o 4f3Lfb
d 3ykfXyOgy o EM1104FFafl u gmOu gmC1
negmC o ENJS/XNMEN, I rfEl V, Hfhn SENn Eh
: y3zgAC o T100j 4fl r2EV, f: I VKfGI hd XVKh

Analytical Results

hRt @lsOvx: WnHEL	Client sample ID	GW2	GWj 3	@@@@	@@@@	@@@@
	Client sampling date / time	0T@ll U@011f1Fc00	0T@ll U@011f1Fc00	@@@@	@@@@	@@@@
Compound CAS Number	LOR Unit	EM1104AAm8001	EM1104AAm800j	8888	8888	8888
EP0j 3G: HoVa+. yaNide By uiscreVé nNa+yser 8. oNVN7ed						
HoVa+. yaNide Fj @T@	0B04 u /r	0642	0600A	@@@@	@@@@	@@@@
EP0j 9G: Weak ncid uissociab+e . yaNide By uiscreVé nNa+yser						
Weak ncid uissociab+e . yaNide @@@@	0B04 u /r	<0B04	<0B04	@@@@	@@@@	@@@@
EP040v:)+7oride by v. HiVaVor						
)+7oride 18ab4@b@	0B1 u /r	16A	063	@@@@	@@@@	@@@@
EP0AAG: nt t oNia as I by uiscreVé nNa+yser						
nt t oNia as I j 884@1@	0B01 u /r	11j	0618	@@@@	@@@@	@@@@
EP0A2G: I iVriVé as I by uiscreVé nNa+yser						
I iVriVé as I @@@@	0B01 u /r	0601	0601	@@@@	@@@@	@@@@
EP0A9G: I iVraVé as I by uiscreVé nNa+yser						
^ I iVraVé as I 14j aj @F@	0B01 u /r	<0B01	0650	@@@@	@@@@	@@@@
EP0AmG: I iVriVé p+7s I iVraVé as I Fl O°Z by uiscreVé nNa+yser						
I iVriVé - I iVraVé as I @@@@	0B01 u /r	0601	0651	@@@@	@@@@	@@@@
EP021G: LeacV(e vhosphor7s as v by discreVé aNa+yser						
LeacV(e vhosphor7s as v @@@@	0B01 u /r	<0B01	<0B01	@@@@	@@@@	@@@@
EP09AM: I 7+ide as I j 8						
I 7+ide as I j 8 1b4a8@F@	0B1 u /r	<0B1	<0B1	@@@@	@@@@	@@@@
El 0AA: ToNic Ba+aNce						
^ HoVa+nNioNs @@@@	0B01 u gq/r	j 460	j 960	@@@@	@@@@	@@@@
^ HoVa+. aVoNs @@@@	0B01 u gq/r	@@@@	506A	@@@@	@@@@	@@@@
HoVa+. aVoNs @@@@	0B01 u gq/r	j A64	@@@@	@@@@	@@@@	@@@@
^ ToNic Ba+aNce @@@@	0B01 %	@@@@	4650	@@@@	@@@@	@@@@
ToNic Ba+aNce @@@@	0B01 %	j 6nj	@@@@	@@@@	@@@@	@@@@
Ev024n: MoNocyc+ic nrot aVc CydrocarboNs						
I VyreNe 100@T@	F µ /r	<F	<F	@@@@	@@@@	@@@@
Tsopropy+beNzeNe ab@T@	F µ /r	<F	<F	@@@@	@@@@	@@@@
N8vropy+beNzeNe 10Y@F@	F µ /r	<F	<F	@@@@	@@@@	@@@@
1656A8Hrit eVhy+beNzeNe 10b@j @	F µ /r	<F	<F	@@@@	@@@@	@@@@
sec8B7Vy+beNzeNe 1YF@b@	F µ /r	<F	<F	@@@@	@@@@	@@@@
16j 6t8Hrit eVhy+beNzeNe aF@Y@	F µ /r	<F	<F	@@@@	@@@@	@@@@
VérV8B7Vy+beNzeNe ab@8@	F µ /r	<F	<F	@@@@	@@@@	@@@@
p8Tsopropy+Vo+7eNe aa@j @	F µ /r	<F	<F	@@@@	@@@@	@@@@
N8B7Vy+beNzeNe 104@f1@	F µ /r	<F	<F	@@@@	@@@@	@@@@
Ev024B: O°ygeNaVed . ot po7Nds						
RiNy+nceVaVe 10b@F@	F0 µ /r	<F0	<F0	@@@@	@@@@	@@@@
j 8B7VaNoNe FMEPZ j b@Y@	F0 µ /r	<F0	<F0	@@@@	@@@@	@@@@

: s g
d 3ykfXyOgy
negmC
: y3zgAC

o Ff3Lfb
o EM1104FFafl u gmOu gmf1
o ENJS/XNMEN, I rfEl V, Hfhn 5ENn Eh
o T100j 4fl r2EV, f: I VKfGI hd XVKh

Analytical Results

hRt @lsQx: WnHEL	Client sample ID	GW2	GWj 3	@@@	@@@	@@@
	Client sampling date / time	0T@ll U@011f1Fo00	0T@ll U@011f1Fo00	@@@	@@@	@@@
Compound	*CAS Number* / *LOR* / *Unit*	EM1104AAm8001	EM1104AAm800j	8888	8888	8888
Ev024B: O°ygeNaVéd . ot po7Nds 8. oNVN7ed						
48MeVhy-6j 8peNVaNoNe RMTBPZ	10b@0@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
j 8Ce°aNoNe RMBPZ	Fa1@b@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
Ev024. : l 7-foNaVéd . ot po7Nds						
. arboN dis7-fide	j F@F@ F µ /r	<F	<F	@@@	@@@	@@@
Ev024u:) 7t igaNVs						
j 6 8uich-oropropaNe	Fa4@0@ F µ /r	<F	<F	@@@	@@@	@@@
16 8uich-oropropaNe	j b@j @ F µ /r	<F	<F	@@@	@@@	@@@
cis8165 8uich-oropropy-eNe	10081@1@ F µ /r	<F	<F	@@@	@@@	@@@
VaNs8165 8uich-oropropy-eNe	10081@T@ F µ /r	<F	<F	@@@	@@@	@@@
16 8uibrot oeVhaNe REu BZ	108@Y@ F µ /r	<F	<F	@@@	@@@	@@@
Ev024E: CaogeNaVéd n-iphaVc . ot po7Nds						
uich-orodif-7orot eVhaNe	j F@1@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
. h-orot eVhaNe	j 4@j @ F0 µ /r	<F0	<F0	@@@	@@@	@@@
RiNy-ch-oride	j F@1@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
Brot ot eVhaNe	j 4@Y@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
. h-oroeVhaNe	j F@0@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
Hrich-orof-7orot eVhaNe	j F@a@ F0 µ /r	<F0	<F0	@@@	@@@	@@@
1618uich-oroeVheNe	j F@F@ F µ /r	<F	<F	@@@	@@@	@@@
Todot eVhaNe	j 4@b@ F µ /r	<F	<F	@@@	@@@	@@@
VaNs816 8uich-oroeVheNe	1F8@0@ F µ /r	<F	<F	@@@	@@@	@@@
1618uich-oroeVhaNe	j F@4@ F µ /r	<F	<F	@@@	@@@	@@@
cis816 8uich-oroeVheNe	1F8@a@ F µ /r	<F	<F	@@@	@@@	@@@
16161 8Hrich-oroeVhaNe	j 1@F@ F µ /r	<F	<F	@@@	@@@	@@@
1618uich-oropropy-eNe	F8Y@b@ F µ /r	<F	<F	@@@	@@@	@@@
. arboN HeVach-oride	F8@Y@ F µ /r	<F	<F	@@@	@@@	@@@
16 8uich-oroeVhaNe	10j @8@ F µ /r	<F	<F	@@@	@@@	@@@
Hrich-oroeVheNe	j a@1@ F µ /r	<F	<F	@@@	@@@	@@@
uibrot ot eVhaNe	j 4@F@ F µ /r	<F	<F	@@@	@@@	@@@
1616 8Hrich-oroeVhaNe	j a@0@ F µ /r	<F	<F	@@@	@@@	@@@
165 8uich-oropropaNe	14T@b@ F µ /r	<F	<F	@@@	@@@	@@@
HeVach-oroeVheNe	1Tj @b@ F µ /r	<F	<F	@@@	@@@	@@@
1616 6 8HeVach-oroeVhaNe	8Y0@0@ F µ /r	<F	<F	@@@	@@@	@@@
VaNs8164 8uich-oro6 8o7VéNe	110@j @ F µ /r	<F	<F	@@@	@@@	@@@
cis8164 8uich-oro6 8o7VéNe	14j 8@1@ F µ /r	<F	<F	@@@	@@@	@@@
1616 6 8HeVach-oroeVhaNe	j a@4@ F µ /r	<F	<F	@@@	@@@	@@@
16 658Hrich-oropropaNe	a8@b@ F µ /r	<F	<F	@@@	@@@	@@@
veNVach-oroeVhaNe	j 8@1@ F µ /r	<F	<F	@@@	@@@	@@@
16 8uibrot o858ch-oropropaNe	a8@T@ F µ /r	<F	<F	@@@	@@@	@@@

: s g o 8f3Lfb
d 3ykfXyOgy o EM1104FFafl u gmOu gmf1
negmC o ENJS/XNMEN, I rfEI V, Hfhn SENn Eh
: y3zgAC o T100j 4fl r2EV, f: I VKfGI hd XVKh

Analytical Results

hRt @lsOyx: WnHEL				Client sample ID	GW2	GWj 3	@@@@	@@@@	@@@@
				Client sampling date / time	0T@ll U@011f1Fo00	0T@ll U@011f1Fo00	@@@@	@@@@	@@@@
Compound	CAS Number	LOR	Unit		EM1104AAm8001	EM1104AAm800j	8888	8888	8888
Ev024E: CatogeNaVed nitphaVc . ot po7Nds 8. oNVN7ed									
Ce° achtorob7VadieNe	bj @b@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Ev024) : CatogeNaVed nrot aVc . ot po7Nds									
. htorobeNzeNe	10b@0@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Brot obeNzeNe	10b@8@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
j 8 htoroVo7eNe	aF@a@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
48 htoroVo7eNe	108@Y@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
1658uichtorobeNzeNe	F41@Y@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
1648uichtorobeNzeNe	108@8@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
1ĵ 8uichtorobeNzeNe	aF@0@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
1ĵ 648HrichtorobeNzeNe	1T0@T@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
1ĵ 658HrichtorobeNzeNe	bj @1@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Ev024G: Hrihatot eVhaNes									
. htorofort	8j @8@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Brot odichtorot eVhaNe	j F@j @	F	µ /r		<F	<F	@@@@	@@@@	@@@@
uibrot ochtorot eVhaNe	1T4@b@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Brot ofort	j F@F@	F	µ /r		<F	<F	@@@@	@@@@	@@@@
Ev02AR TMZB: votyN7c-ear nrot aVc CydrocarboNs									
I aphVhateNe	a1@0@	1E0	µ /r		m6l	<1E0	@@@@	@@@@	@@@@
nceNaphVhyteNe	T0b@8@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
nceNaphVheNe	bY@T@	1E0	µ /r		168	<1E0	@@@@	@@@@	@@@@
)7oreNe	b8@Y@	1E0	µ /r		16A	<1E0	@@@@	@@@@	@@@@
vheNaNVhreNe	bF@1@	1E0	µ /r		164	<1E0	@@@@	@@@@	@@@@
nNVhraceNe	1T0@T@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
)7oraNVheNe	T08@4@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
vyreNe	1Ta@0@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
BeNzFaZaNVhraceNe	F8@F@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
. hryseNe	T1b@1@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
BeNzoFbZ7oraNVheNe	T0F@a@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
BeNzoFkZ7oraNVheNe	T0j @b@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
BeNzoFaZpyreNe	F0@T@	0EF	µ /r		<0EF	<0EF	@@@@	@@@@	@@@@
TNdeNoP1ĵ 656cdZpyreNe	1aY@a@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
uibeNzFa6hZaNVhraceNe	FY@0@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
BeNzoFg6h6Zpery+eNe	1a1@4@	1E0	µ /r		<1E0	<1E0	@@@@	@@@@	@@@@
^l 7t of po+ycyc+ic arot aVc hydrocarboNs	@@@@	0EF	µ /r		1563	<1E0	@@@@	@@@@	@@@@
Ev090/021: HoVa+veVo+e7t CydrocarboNs									
. 3 8. m) racVoN	@@@@	T0	µ /r		<T0	<T0	@@@@	@@@@	@@@@
. 10 8. 14) racVoN	@@@@	F0	µ /r		<F0	<F0	@@@@	@@@@	@@@@

: s g
d 3ykfXyOgy
negmC
: y3zgAC

o j f3Lfb
o EM1104FFafl u gmOu gmf1
o ENJS/XNMEN, I rfEl V, Hfhn SENn Eh
o T100j 4fl r2EV, f: I VKfGI hd XVKh

Analytical Results

hRt @lsOyx: WnHEL			Client sample ID	GW2	GWj 3	@@@@	@@@@	@@@@
			Client sampling date / time	0T@ll U@011f1Fo00	0T@ll U@011f1Fo00	@@@@	@@@@	@@@@
Compound	CAS Number	LOR	Unit	EM1104AAm8001	EM1104AAm800j	8888	8888	8888
Ev090/021: HoVa+veVo+e7t CydrocarboNs 8. oNVN7ed								
. 1A8. j 9) racVoN	@@@@	100	µ /r	**jj 0**	**120**	@@@@	@@@@	@@@@
. j m8. 53) racVoN	@@@@	F0	µ /r	**30**	**90**	@@@@	@@@@	@@@@
^. 10 8. 53) racVoNFs7t Z	@@@@	F0	µ /r	**j 90**	**j A0**	@@@@	@@@@	@@@@
Ev090/021: HoVa+Leco(erab+e CydrocarboNs 8I EvM j 010 urafV								
. 3 8. 10) racVoN	@@@@	T0	µ /r	<T0	<T0	@@@@	@@@@	@@@@
^. 3 8. 10) racVoN t iN7s BHEX Fj 1Z	@@@@	T0	µ /r	<T0	<T0	@@@@	@@@@	@@@@
>. 10 8. 13) racVoN	@@@@	100	µ /r	<100	<100	@@@@	@@@@	@@@@
>. 13 8. 54) racVoN	@@@@	100	µ /r	**j 50**	**j 10**	@@@@	@@@@	@@@@
>. 54 8. 40) racVoN	@@@@	100	µ /r	<100	<100	@@@@	@@@@	@@@@
^>. 10 8. 40) racVoNFs7t Z	@@@@	100	µ /r	**j 50**	**j 10**	@@@@	@@@@	@@@@
Ev090: BHEXI								
BeNzeNe	j 1@Y@	1	µ /r	<1	<1	@@@@	@@@@	@@@@
Ho+7eNe	10b@b@	T	µ /r	<T	<T	@@@@	@@@@	@@@@
EVhy+beNzeNe	100@1@	T	µ /r	<T	<T	@@@@	@@@@	@@@@
t eVa8& para8Xy+eNe	10b@b@f108@T@	T	µ /r	<T	<T	@@@@	@@@@	@@@@
orVho8Xy+eNe	aF@j @	T	µ /r	<T	<T	@@@@	@@@@	@@@@
^ HoVa+Xy+eNes	1YY0@0@	T	µ /r	<T	<T	@@@@	@@@@	@@@@
^I 7t of BHEX	@@@@	1	µ /r	<1	<1	@@@@	@@@@	@@@@
I aphVha+eNe	a1@0@	F	µ /r	<F	<F	@@@@	@@@@	@@@@
Ev024I : RO. I 7rrogaVés								
1ç 8uich+oroeVhaNe8u4	1j 080@j @	0BI	%	**mj 0**	**9m9**	@@@@	@@@@	@@@@
Ho+7eNe8u9	T0Yj @8@	0BI	%	**mm9**	**9A8m**	@@@@	@@@@	@@@@
48Brot of+7orobeNzeNe	480@0@	0BI	%	**mA8**	**936I**	@@@@	@@@@	@@@@
Ev02AFI TMZI : vheNo+ic . ot po7Nd I 7rrogaVés								
vheNo+8d3	1Y1Tj @b@	0BI	%	**116**	**j 16**	@@@@	@@@@	@@@@
j 8. h+oropheNo+8u4	aYaF1@Y@	0BI	%	**4m8**	**A96m**	@@@@	@@@@	@@@@
j 6t68Hribrot opheNo+	11b@a@	0BI	%	**5m6I**	**236I**	@@@@	@@@@	@@@@
Ev02AFI TMZH: vnC I 7rrogaVés								
j 8)+7orobipheNy+	YT1@0@	0BI	%	**4A6I**	**9A6m**	@@@@	@@@@	@@@@
nNVhraceNe8d10	1j 1a@8@	0BI	%	**AA8**	**2j 62**	@@@@	@@@@	@@@@
48HerpheNy+8d14	1j 1b@1@	0BI	%	**A06I**	**2560**	@@@@	@@@@	@@@@
Ev090I : HvCFRZBHEX I 7rrogaVés								
1ç 8uich+oroeVhaNe8u4	1j 080@j @	0BI	%	**m46**	**mj 6I**	@@@@	@@@@	@@@@
Ho+7eNe8u9	T0Yj @8@	0BI	%	**mj 6I**	**2m6I**	@@@@	@@@@	@@@@
48Brot of+7orobeNzeNe	480@0@	0BI	%	**m160**	**906j**	@@@@	@@@@	@@@@

Surrogate Control Limits

hRt @Mls9yx: WnHEL		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
Ev024I : RO. I 7rrogaVés			
16j 8uich+oroeVhaNe8u4	1j 080@j @	j T	1YT
Ho+7eNe8u9	T0Yj @8@	j 4	1Tb
48Brot of+7orobeNzeNe	480@0@	j 0	1YT
Ev02AFi TMZI : vheNo+ic . ot po7Nd I 7rrogaVés			
vheNo+8d3	1Y1Tj @b@	10	Fb
j 8 h+oropheNo+8u4	aYaF1@Y@	10	1T4
j 6468Hribrot opheNo+	11b@a@	T8	1Yb
Ev02AFi TMZH: vnC I 7rrogaVés			
j 9)+7orobipheNy+	YT1@0@	YT	1TT
nNVhraceNe8d10	1j 1a@8@	Y4	1Y8
48HerpheNy+8d14	1j 1b@1@	Y4	140
Ev090I : HvCFRZBHEX I 7rrogaVés			
16j 8uich+oroeVhaNe8u4	1j 080@j @	j Y	1Y1
Ho+7eNe8u9	T0Yj @8@	j T	1T4
48Brot of+7orobeNzeNe	480@0@	j 0	1T8

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Environmental Earth Sciences	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: P.O.BOX 2253, FOOTSCRAY , VIC, 3011	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: 210074 ALBERT PARK GAS WORKS	ALS QUOTE NO.: ME/015/11 V3	COC SEQUENCE NUMBER (Circle)
ORDER NUMBER:		CO 1 2 3 4 5
PROJECT MANAGER: DAVID JAMES	CONTACT PH: 0437 033 796	OI 1 2 3 4 5
SAMPLER:	SAMPLER MOBILE: 0437 033 796	Free ice/ frozen ice bricks present upon receipt? Yes No N/A
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): ENMRG & ESDAT	Random Sample Temperature on Receipt: 22.7 °C
Email Reports to (will default to PM if no other addresses are listed):		Other comment:
Email Invoice to (will default to PM if no other addresses are listed):		

RELINQUISHED BY: DJ	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 3/5/2011 10:30am	DATE/TIME:	DATE/TIME:	DATE/TIME: 3/5/11 10:30

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH, TDS, Free Cyanide, Total cyanide, WAD cyanide, Sulphide	NT-1 package - Ca, Mg, Na, K	NT-2 Package - Cl, SO4, Alk	NT-3 Package - NO2, NO3, Fl, Reactive P	NH4 - Ammonium - (field pH and field temperature must be recorded)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B, Mn & Hg (lab to centrifuge, filter and acidify from red/green metals bottle)	Hexavalent Chromium	W-10 Package - TPH/BTEX/PAH Plus VOC		Sample Ph	Sample Temp		
1	GW7	2/05/2011			8	X	X	X	X	X	X	X	X		5.98	21.80		
2	GW26	20/04/2011			8	X	X	X	X	X	X	X	X		6.25	21.80		
				TOTAL	16	2	2	2	2	2	2		2					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde P
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

COC rec'd 3/5/11 3:50 Peter

Environmental Division
Melbourne
JL
Work Order
EM1104559

Telephone : +61-3-8549 9600

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1104559**	Page	: 1 of 16
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 6 Westall Rd S4ringvale VIC Australia 31p1
E7mail	: d-amesj eesi.bi@	E7mail	: carol.z alshj alsenviro.com
Tele4hone	: w+1 9+8p1+++	Tele4hone	: w+17378569 9+08
Facsimile	: w+1 03 9+8p1866	Facsimile	: w+17378569 9+01
Pro-ect	: 2100p6 ALBERT PARK GASWORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: 7777		
C7O7C number	: 7777	Date Sam4les Received	: 037MAY72011
Sam4ler	: 7777	Issue Date	: 107MAY72011
Order number	: 7777		
		No. of sam4les received	: 2
Quote number	: ME/015/11 V3	No. of sam4les analysed	: 2

This re4ort su4ersedes any 4revious re4ort(s) z ith this reference. Results a44ly to the sam4le(s) as submitted. All 4ages of this re4ort have been checked and a44roved for release.

This Quality Control Re4ort contains the folloz ing information:

- Laboratory Du4licate (DUP) Re4ort; Relative Percentage Difference (RPD) and Acce4tance Limits
- Method Blank (MB) and Laboratory Control S4ike (LCS) Re4ort; Recovery and Acce4tance Limits
- Matrix S4ike (MS) Re4ort; Recovery and Acce4tance Limits

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

This document is issued in accordance z ith NATA accreditation requirements.

Accredited for com4liance z ith ISO/IEC 1p025.

Signatories

This document has been electronically signed by the authori@ed signatories indicated beloz. Electronic signing has been carried out in com4liance z ith 4rocedures s4ecified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical 4rocedures used by the Environmental Division have been develo4ed from established internationally recogni@d 4rocedures such as those 4ublished by the USEPA, APHA, AS and NEPM. In house develo4ed 4rocedures are em4loyed in the absence of documented standards or by client request.

Where moisture determination has been 4erformed, results are re4orted on a dry z eight basis.

Where a re4orted less than (<) result is higher than the LOR, this may be due to 4rimary sam4le extract/digestate dilution and/or insuffient sam4le for analysis.

Where the LOR of a re4orted result differs from standard LOR, this may be due to high moisture content, insufficient sam4le (reduced z eight em4loyed) or matrix interference.

Key : Anonymous = Refers to sam4les z hich are not s4ecifically 4art of this z ork order but formed 4art of the QC 4rocess lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of re4orting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Du4licate refers to a randomly selected intralaboratory s4lit. Laboratory du4licates 4rovide information regarding method 4recision and sam4le heterogeneity. The 4ermitted ranges for the Relative Percent Deviation (RPD) of Laboratory Du4licates are s4ecified in ALS Method QWI7EN/38 and are de4endent on the magnitude of results in com4arison to the level of re4orting: Result < 10 times LOR:7 No Limit; Result betz een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pH (QC Lot: 1774124)									
EM11065517001	Anonymous	EA005: 4H Value	7777	0.01	4H Unit	+.90	+.90	0.0	0% 720%
EM11065p1700+	Anonymous	EA005: 4H Value	7777	0.01	4H Unit	p.1+	p.18	0.3	0% 720%
EA015: Total Dissolved Solids (QC Lot: 1773871)									
EM11065597001	GWp	EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	1+60	1++0	1.6	0% 720%
EM11065927002	Anonymous	EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	+000	5890	1.9	0% 720%
ED037P: Alkalinity by PC Titrator (QC Lot: 1773304)									
EM11065607008	Anonymous	ED03p7P: Hydroxide Alkalinity as CaCO3	DMO72107001	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Carbonate Alkalinity as CaCO3	38127327+	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Bicarbonate Alkalinity as CaCO3	p175273	1	mg/L	38p	388	0.0	0% 720%
		ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	38p	388	0.0	0% 720%
EM11065617005	Anonymous	ED03p7P: Hydroxide Alkalinity as CaCO3	DMO72107001	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Carbonate Alkalinity as CaCO3	38127327+	1	mg/L	<1	2	0.0	No Limit
		ED03p7P: Bicarbonate Alkalinity as CaCO3	p175273	1	mg/L	3	3	0.0	No Limit
		ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	3	5	68.6	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 1774116)									
EM11065937006	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	392	392	0.0	0% 720%
EM11065627001	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	15p	1+3	3.8	0% 720%
ED045G: Chloride Discrete analyser (QC Lot: 1774138)									
EM11065627001	Anonymous	ED065G: Chloride	1+88p7007+	1	mg/L	2690	3020	19.2	0% 720%
EM1106562702p	Anonymous	ED065G: Chloride	1+88p7007+	1	mg/L	1p80	1+30	8.8	0% 720%
ED093F: Dissolved Major Cations (QC Lot: 1774140)									
EM11065517001	Anonymous	ED093F: Calcium	p6607p072	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	p6397957 6	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	p6607237 5	1	mg/L	1	<1	0.0	No Limit
		ED093F: Potassium	p6607097p	1	mg/L	<1	<1	0.0	No Limit
EM11065+9700+	Anonymous	ED093F: Calcium	p6607p072	1	mg/L	3+0	3++	1.p	0% 720%
		ED093F: Magnesium	p6397957 6	1	mg/L	1020	1030	0.8	0% 720%
		ED093F: Sodium	p6607237 5	1	mg/L	+5p0	+p+0	2.8	0% 720%
		ED093F: Potassium	p6607097p	1	mg/L	62p	630	0.p	0% 720%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1776768)									
EM11065597001	GWp	EG020A7F: Cadmium	p6607637 9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	p6607387 2	0.001	mg/L	0.086	0.085	0.0	0% 720%
		EG020A7F: Cobalt	p6607687 6	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Co44er	p6607507 8	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1776768) - continued									
EM11065597001	GWp	EG020A7F: Lead	p6397927l	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	p6397+75	0.001	mg/L	0.138	0.160	1.6	0% 720%
		EG020A7F: Nickel	p6607027O	0.001	mg/L	0.00p	0.00p	0.0	No Limit
		EG020A7F: Zinc	p6607++7+	0.005	mg/L	0.02+	0.01p	60.0	No Limit
		EG020A7F: Aluminium	p6297907S	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	pp827697Z	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	p6607627B	0.05	mg/L	0.86	0.82	3.6	0% 750%
		EG020A7F: Iron	p6397897+	0.05	mg/L	0.12	0.11	12.3	No Limit
EM11065pp7001	Anonymous	EG020A7F: Cadmium	p6607637Q	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	p6607387Z	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	p6607687G	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Co44er	p6607507B	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Lead	p6397927l	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	p6397+75	0.001	mg/L	0.015	0.009	69.2	No Limit
		EG020A7F: Nickel	p6607027O	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Zinc	p6607++7+	0.005	mg/L	0.02+	<0.005	13+	No Limit
		EG020A7F: Aluminium	p6297907S	0.01	mg/L	0.31	0.36	8.1	0% 720%
		EG020A7F: Selenium	pp827697Z	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	p6607627B	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	p6397897+	0.05	mg/L	0.29	0.25	13.3	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1776767)									
EM11065597001	GWp	EG035F: Mercury	p6397p7+	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM11065987008	Anonymous	EG035F: Mercury	p6397p7+	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG050F: Dissolved Hexavalent Chromium (QC Lot: 1778417)									
EM11065517001	Anonymous	EG050F: Hexavalent Chromium	185607297Q	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1776352)									
EM11065517001	Anonymous	EK025G: Free Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM11065pp7008	Anonymous	EK025G: Free Cyanide	7777	0.006	mg/L	0.168	0.159	+.9	0% 720%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1776357)									
EM11066257006	Anonymous	EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM1106+097002	Anonymous	EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1774001)									
EM11061807001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM11061807011	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 1773302)									
EM11065257001	Anonymous	EK060P: Fluoride	1+9867687B	0.1	mg/L	0.8	0.8	0.0	No Limit
EM110653+7001	Anonymous	EK060P: Fluoride	1+9867687B	0.1	mg/L	0.+	0.+	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1774137)									
EM11065627001	Anonymous	EK05pG: Nitrite as N	7777	0.01	mg/L	0.01	0.01	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1774137) - continued									
EM1106562702p	Anonymous	EK05pG: Nitrite as N	7777	0.01	mg/L	0.02	0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1774233)									
EM1106562700+	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1106551701	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 1774141)									
EM1106559701	GWp	EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM11065+9700+	Anonymous	EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK085M: Sulfide as S2- (QC Lot: 1773968)									
EM110660p7001	Anonymous	EK085: Sulfide as S27	1869+72578	0.1	mg/L	32.8	32.8	0.0	0% 720%
EM11066p57006	Anonymous	EK085: Sulfide as S27	1869+72578	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1776895)									
EM1106559701	GWp	EP0p6: Styrene	1007627 5	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Iso4ro4ylben@ne	9878278	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: n7Pro4ylben@ne	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.3.57Trimethylben@ne	1087+p78	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: sec7Butylben@ne	1357987 8	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.67Trimethylben@ne	957+37+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: tert7Butylben@ne	9870+7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 47Iso4ro4yltoluene	9978p7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: n7Butylben@ne	1067517 8	5	µg/L	<5	<5	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 1776895)									
EM1106559701	GWp	EP0p6: Vinyl Acetate	1087057 6	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 27Butanone (MEK)	p879373	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 67Methyl7274entanone (MIBK)	1087107 1	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 27Hexanone (MBK)	5917p87+	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 1776895)									
EM1106559701	GWp	EP0p6: Carbon disulfide	p571570	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 1776895)									
EM1106559701	GWp	EP0p6: 2.27Dichloro4ro4ane	5967207p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloro4ro4ane	p878p75	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.37Dichloro4ro4ylene	100+170175	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.37Dichloro4ro4ylene	100+17027+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dibromoethane (EDB)	10+79376	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 1776895)									
EM1106559701	GWp	EP0p6: 1.17Dichloroethene	p573576	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Iodomethane	p678876	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.27Dichloroethene	15+7+075	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.17Dichloroethane	p573673	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.27Dichloroethene	15+75972	5	µg/L	<5	<5	0.0	No Limit

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 1776895) - continued									
EM11065597001	GWp	EP0p6: 1.1.17Trichloroethane	p17557+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.17Dichloro4ro4ylene	5+37587+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Carbon Tetrachloride	5+72375	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloroethane	10p70+72	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Trichloroethene	p97017+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dibromomethane	p679573	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.27Trichloroethane	p970075	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.37Dichloro4ro4ane	16272879	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Tetrachloroethene	12p71876	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.1.27Tetrachloroethane	+307207+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.67Dichloro727butene	11075p7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.67Dichloro727butene	16p+71175	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.2.27Tetrachloroethane	p973675	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.37Trichloro4ro4ane	9+71876	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Pentachloroethane	p+7017p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dibromo737chloro4ro4ane	9+71278	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Hexachlorobutadiene	8p7+873	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dichlorodifluoromethane	p57p178	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Chloromethane	p678p73	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Vinyl chloride	p570176	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Bromomethane	p678379	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Chloroethane	p570073	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Trichlorofluoromethane	p57+976	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 1776895)									
EM11065597001	GWp	EP0p6: Chloroben@ene	1087907p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Bromoben@ene	1087871	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 27Chlorotoluene	957697871	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 67Chlorotoluene	10+76376	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.37Dichloroben@ene	5617p371	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.67Dichloroben@ene	10+76+7p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloroben@ene	957507871	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.67Trichloroben@ene	12078271	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.37Trichloroben@ene	8p7+17+	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 1776895)									
EM11065597001	GWp	EP0p6: Chloroform	+p7++73	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Bromodichloromethane	p572p76	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dibromochloromethane	12676871	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Bromoform	p572572	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1776896)									

Sub7Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1776896) - continued									
EM11065597001	GWp	EP080: C+ 7C9 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1776896)									
EM11065597001	GWp	EP080: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1776896)									
EM11065597001	GWp	EP080: Ben@ne	p176372	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	1087883	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylben@ne	1007617	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta7& 4ara7Xylene	1087383 10+76273	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho7Xylene	9576p7+	2	µg/L	<2	<2	0.0	No Limit
		EP080: Na4hthalene	917203	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to z hich all reagents are added in the same volumes or 4ro4ortions as used in standard sam4le 4re4aration. The 4ur4ose of this QC 4arameter is to monitor 4otential laboratory contamination. The quality control term Laboratory Control Sam4le (LCS) refers to a certified reference material, or a knoz n interference free matrix s4iked z ith target analytes. The 4ur4ose of this QC 4arameter is to monitor method 4recision and accuracy inde4endent of sam4le matrix. Dynamic Recovery Limits are based on statistical evaluation of 4rocessed LCS.

Sub7Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids (QCLot: 1773871)								
EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	<5	2000 mg/L	101	98	106
ED037P: Alkalinity by PC Titrator (QCLot: 1773304)								
ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	92.5	pp	12p
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1774116)								
ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	<1	12.5 mg/L	9p.+	81	125
ED045G: Chloride Discrete analyser (QCLot: 1774138)								
ED065G: Chloride	1+88p7007+	1	mg/L	<1	1000 mg/L	111	89	11p
ED093F: Dissolved Major Cations (QCLot: 1774140)								
ED093F: Calcium	p6607p072	1	mg/L	<1	5 mg/L	116	81	129
ED093F: Magnesium	p6397957 6	1	mg/L	<1	5 mg/L	10p	80	120
ED093F: Sodium	p6607237 5	1	mg/L	<1	50 mg/L	105	p8	126
ED093F: Potassium	p660709 7p	1	mg/L	<1	50 mg/L	119	p9	121
EG020F: Dissolved Metals by ICP-MS (QCLot: 1776768)								
EG020A7F: Aluminium	p6297907 5	0.01	mg/L	<0.01	0.5 mg/L	102	80	120
EG020A7F: Arsenic	p6607387 2	0.001	mg/L	<0.001	0.1 mg/L	93.+	8p	109
EG020A7F: Cadmium	p6607637 9	0.0001	mg/L	<0.0001	0.1 mg/L	96.3	88	110
EG020A7F: Cobalt	p6607687 6	0.001	mg/L	<0.001	0.1 mg/L	92.5	8p	111
EG020A7F: Co44er	p6607507 8	0.001	mg/L	<0.001	0.1 mg/L	90.6	8+	108
EG020A7F: Lead	p6397927 1	0.001	mg/L	<0.001	0.1 mg/L	100	90	110
EG020A7F: Manganese	p6397 9+75	0.001	mg/L	<0.001	0.1 mg/L	93.1	8p	111
EG020A7F: Nickel	p6607027 0	0.001	mg/L	<0.001	0.1 mg/L	92.2	8+	112
EG020A7F: Selenium	pp827697 2	0.01	mg/L	<0.01	0.1 mg/L	95.2	83	111
EG020A7F: Zinc	p6607++7+	0.005	mg/L	<0.005	0.1 mg/L	95.+	8+	120
EG020A7F: Boron	p6607627 8	0.05	mg/L	<0.05	0.1 mg/L	106	+1	133
EG020A7F: Iron	p639789 7+	0.05	mg/L	<0.05	0.5 mg/L	95.2	p9	119
EG035F: Dissolved Mercury by FIMS (QCLot: 1776767)								
EG035F: Mercury	p6397 9p7+	0.0001	mg/L	<0.0001	0.0100 mg/L	90.+	p1	125
EG050F: Dissolved Hexavalent Chromium (QCLot: 1778417)								
EG050F: Hexavalent Chromium	185607297 9	0.01	mg/L	<0.01	0.5 mg/L	102	80	120
EK025G: Free cyanide by Discrete Analyser (QCLot: 1776352)								
EK025G: Free Cyanide	7777	0.006	mg/L	<0.006	0.5 mg/L	p9.6	p3	111
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1776357)								
EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	0.2 mg/L	111	85	125

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1774001)								
EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	0.5 mg/L	p9.8	+6	106
EK040P: Fluoride by PC Titrator (QCLot: 1773302)								
EK060P: Fluoride	1+9867687 8	0.1	mg/L	<0.1	5 mg/L	99.+	p8	120
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1774137)								
EK05pG: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	89.9	86	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1774233)								
EK059G: Nitrite wNitrate as N	7777	0.01	mg/L	<0.01	0.5 mg/L	9+.2	p3	12p
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1774141)								
EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	0.5 mg/L	95.6	86	108
EK085M: Sulfide as S2- (QCLot: 1773968)								
EK085: Sulfide as S27	1869+7257 8	0.10	mg/L	<0.1	0.5 mg/L	95.0	82	11+
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1776895)								
EP0p6: Styrene	1007627 5	5	µg/L	<5	20 µg/L	105	p6	122
EP0p6: Iso4ro4ylben@ne	987827 8	5	µg/L	<5	20 µg/L	105	80	120
EP0p6: n7Pro4ylben@ne	1037+571	5	µg/L	<5	20 µg/L	91.2	p0	120
EP0p6: 1.3.57Trimethylben@ne	1087+p78	5	µg/L	<5	20 µg/L	93.3	p1	119
EP0p6: sec7Butylben@ne	1357987 8	5	µg/L	<5	20 µg/L	95.6	p2	120
EP0p6: 1.2.67Trimethylben@ne	957+37+	5	µg/L	<5	20 µg/L	96.p	p3	119
EP0p6: tert7Butylben@ne	987 0+7+	5	µg/L	<5	20 µg/L	96.3	p3	119
EP0p6: 47Iso4ro4yltoluene	997 8p7+	5	µg/L	<5	20 µg/L	95.1	p1	121
EP0p6: n7Butylben@ne	1067517 8	5	µg/L	<5	20 µg/L	9+.3	+5	121
EP074B: Oxygenated Compounds (QCLot: 1776895)								
EP0p6: Vinyl Acetate	1087057 6	50	µg/L	<50	200 µg/L	99.+	5p	131
EP0p6: 27Butanone (MEK)	p879373	50	µg/L	<50	200 µg/L	111	+9	135
EP0p6: 67Methyl727 4entanone (MIBK)	1087107 1	50	µg/L	<50	200 µg/L	111	+8	13+
EP0p6: 27Hexanone (MBK)	5917p87+	50	µg/L	<50	200 µg/L	111	+8	138
EP074C: Sulfonated Compounds (QCLot: 1776895)								
EP0p6: Carbon disulfide	p571570	5	µg/L	<5	20 µg/L	90.6	+p	12p
EP074D: Fumigants (QCLot: 1776895)								
EP0p6: 2.27Dichloro4ro4ane	5967207p	5	µg/L	<5	20 µg/L	9+.1	59	128
EP0p6: 1.27Dichloro4ro4ane	p878p75	5	µg/L	<5	20 µg/L	100	pp	121
EP0p6: cis71.37Dichloro4ro4ylene	100+170175	5	µg/L	<5	20 µg/L	100	p0	118
EP0p6: trans71.37Dichloro4ro4ylene	100+17027+	5	µg/L	<5	20 µg/L	95.8	++	120
EP0p6: 1.27Dibromoethane (EDB)	10+79376	5	µg/L	<5	20 µg/L	10+	p8	126
EP074E: Halogenated Aliphatic Compounds (QCLot: 1776895)								
EP0p6: Dichlorodifluoromethane	p57p178	50	µg/L	<50	200 µg/L	82.0	58	168
EP0p6: Chloromethane	p678p73	50	µg/L	<50	200 µg/L	8+.0	+2	162

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 1776895) - continued								
EP0p6: Vinyl chloride	p570176	50	µg/L	<50	200 µg/L	p8.2	+1	161
EP0p6: Bromomethane	p678379	50	µg/L	<50	200 µg/L	81.8	5p	131
EP0p6: Chloroethane	p570073	50	µg/L	<50	200 µg/L	99.p	+6	138
EP0p6: Trichlorofluoromethane	p57+976	50	µg/L	<50	200 µg/L	9+.0	+p	131
EP0p6: 1.17Dichloroethene	p573576	5	µg/L	<5	20 µg/L	9+.2	p1	125
EP0p6: Iodomethane	p678876	5	µg/L	<5	20 µg/L	9+.0	+1	135
EP0p6: trans71.27Dichloroethene	15+7+075	5	µg/L	<5	20 µg/L	98.8	p5	121
EP0p6: 1.17Dichloroethane	p573673	5	µg/L	<5	20 µg/L	101	pp	121
EP0p6: cis71.27Dichloroethene	15+75972	5	µg/L	<5	20 µg/L	100	p8	122
EP0p6: 1.1.17Trichloroethane	p17557+	5	µg/L	<5	20 µg/L	95.1	p0	120
EP0p6: 1.17Dichloro4ro4ylene	5+37587+	5	µg/L	<5	20 µg/L	99.1	p6	122
EP0p6: Carbon Tetrachloride	5+72375	5	µg/L	<5	20 µg/L	8+.2	5p	123
EP0p6: 1.27Dichloroethane	10p70+72	5	µg/L	<5	20 µg/L	99.6	p5	125
EP0p6: Trichloroethene	p97017+	5	µg/L	<5	20 µg/L	101	pp	121
EP0p6: Dibromomethane	p679573	5	µg/L	<5	20 µg/L	102	p+	122
EP0p6: 1.1.27Trichloroethane	p970075	5	µg/L	<5	20 µg/L	112	p8	12+
EP0p6: 1.37Dichloro4ro4ane	1627879	5	µg/L	<5	20 µg/L	109	p9	125
EP0p6: Tetrachloroethene	12p71876	5	µg/L	<5	20 µg/L	10+	p+	122
EP0p6: 1.1.1.27Tetrachloroethane	+307207+	5	µg/L	<5	20 µg/L	9p.+	+5	119
EP0p6: trans71.67Dichloro727butene	11075p7+	5	µg/L	<5	20 µg/L	91.5	6+	12+
EP0p6: cis71.67Dichloro727butene	16p+71175	5	µg/L	<5	20 µg/L	103	56	132
EP0p6: 1.1.2.27Tetrachloroethane	p973675	5	µg/L	<5	20 µg/L	116	p5	131
EP0p6: 1.2.37Trichloro4ro4ane	9+71876	5	µg/L	<5	20 µg/L	123	p5	133
EP0p6: Pentachloroethane	p+7017p	5	µg/L	<5	20 µg/L	83.1	6+	118
EP0p6: 1.27Dibromo737chloro4ro4ane	9+71278	5	µg/L	<5	20 µg/L	10+	56	126
EP0p6: Hexachlorobutadiene	8p7+873	5	µg/L	<5	20 µg/L	89.+	50	136
EP074F: Halogenated Aromatic Compounds (QCLot: 1776895)								
EP0p6: Chloroben@ne	1087907p	5	µg/L	<5	20 µg/L	108	81	121
EP0p6: Bromoben@ne	1087871	5	µg/L	<5	20 µg/L	9p.8	p5	119
EP0p6: 27Chlorotoluene	957697	5	µg/L	<5	20 µg/L	93.2	p3	121
EP0p6: 67Chlorotoluene	10+76376	5	µg/L	<5	20 µg/L	96.8	p2	120
EP0p6: 1.37Dichloroben@ne	5617p371	5	µg/L	<5	20 µg/L	105	p3	119
EP0p6: 1.67Dichloroben@ne	10+76+7p	5	µg/L	<5	20 µg/L	105	p6	120
EP0p6: 1.27Dichloroben@ne	957507	5	µg/L	<5	20 µg/L	106	p8	118
EP0p6: 1.2.67Trichloroben@ne	1207827	5	µg/L	<5	20 µg/L	9p.2	5+	128
EP0p6: 1.2.37Trichloroben@ne	8p7+17+	5	µg/L	<5	20 µg/L	101	+9	123
EP074G: Trihalomethanes (QCLot: 1776895)								
EP0p6: Chloroform	+p7++73	5	µg/L	<5	20 µg/L	100	pp	121
EP0p6: Bromodichloromethane	p572p76	5	µg/L	<5	20 µg/L	95.2	+9	11p

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)
				Result	Concentration	LCS	Low	High
EP074G: Trihalomethanes (QCLot: 1776895) - continued								
EP0p6: Dibromochloromethane	12676871	5	µg/L	<5	20 µg/L	9+.+	59	119
EP0p6: Bromoform	p572572	5	µg/L	<5	20 µg/L	96.1	69	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1776648)								
EP0p5(SIM): Na4hthalene	9172073	1	µg/L	<1.0	5 µg/L	50.+	2p.5	126
EP0p5(SIM): Acena4hthylene	20879+78	1	µg/L	<1.0	5 µg/L	+0.3	35	129
EP0p5(SIM): Acena4hthene	837327 9	1	µg/L	<1.0	5 µg/L	51.0	35	12p
EP0p5(SIM): Fluorene	8+7p37p	1	µg/L	<1.0	5 µg/L	55.0	3+	130
EP0p5(SIM): Phenanthrene	8570178	1	µg/L	<1.0	5 µg/L	59.8	62	132
EP0p5(SIM): Anthracene	1207127p	1	µg/L	<1.0	5 µg/L	5p.8	62	132
EP0p5(SIM): Fluoranthene	20+76670	1	µg/L	<1.0	5 µg/L	+6.0	61	161
EP0p5(SIM): Pyrene	1297 0070	1	µg/L	<1.0	5 µg/L	++.p	60	162
EP0p5(SIM): Ben@a)anthracene	5+75573	1	µg/L	<1.0	5 µg/L	8p.2	33	153
EP0p5(SIM): Chrysene	21870179	1	µg/L	<1.0	5 µg/L	++.8	3p	165
EP0p5(SIM): Ben@(b)fluoranthene	20579972	1	µg/L	<1.0	5 µg/L	86.8	35	151
EP0p5(SIM): Ben@(k)fluoranthene	20p70879	1	µg/L	<1.0	5 µg/L	+3.3	39	161
EP0p5(SIM): Ben@(a)4yrene	5073278	0.5	µg/L	<0.5	5 µg/L	p0.0	61	139
EP0p5(SIM): Indeno(1.2.3.cd)4yrene	19373975	1	µg/L	<1.0	5 µg/L	++.p	35	161
EP0p5(SIM): Diben@a.h)anthracene	537p073	1	µg/L	<1.0	5 µg/L	++.9	3+	162
EP0p5(SIM): Ben@(g.h.i)4erylene	19172672	1	µg/L	<1.0	5 µg/L	+8.1	10	162
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1776646)								
EP0p1: C10 7C16 Fraction	7777	50	µg/L	<50	5660 µg/L	9p.6	+6	126
EP0p1: C15 7C28 Fraction	7777	100	µg/L	<100	1p826 µg/L	85.5	p0	130
EP0p1: C29 7C3+ Fraction	7777	50	µg/L	<50	3+96 µg/L	88.2	+8	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1776896)								
EP080: C+ 7C9 Fraction	7777	20	µg/L	<20	320 µg/L	102	p2	13+
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1776646)								
EP0p1: >C10 7C1+ Fraction	7777	100	µg/L	<100	10320 µg/L	p5.2	p0	130
EP0p1: >C1+ 7C36 Fraction	7777	100	µg/L	<100	1++60 µg/L	85.9	p0	130
EP0p1: >C36 7C60 Fraction	7777	100	µg/L	<100	1080 µg/L	98.1	p0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1776896)								
EP080: C+ 7C10 Fraction	7777	20	µg/L	<20	3p0 µg/L	102	p0	130
EP080: BTEXN (QCLot: 1776896)								
EP080: Ben@ne	p176372	1	µg/L	<1	20 µg/L	98.5	p3	12p
EP080: Toluene	10878873	2	µg/L	<2	20 µg/L	101	p6	128
EP080: Ethylben@ne	1007 6176	2	µg/L	<2	20 µg/L	9p.5	p2	12+
EP080: meta7& 4ara7Xylene	10873873 10+76273	2	µg/L	<2	60 µg/L	106	+9	133
EP080: ortho7Xylene	9576p7+	2	µg/L	<2	20 µg/L	98.8	p6	128

Sub7Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 1776896) - continued								
EP080: Na4hthalene	9172073	5	µg/L	<5	5 µg/L	90.2	p0	130

Matrix Spike (MS) Report

The quality control term Matrix S4ike (MS) refers to an intralaboratory s4lit sam4le s4iked z ith a re4resentative set of target analytes. The 4ur4ose of this QC 4arameter is to monitor 4otential matrix effects on analyte recoveries. Static Recovery Limits as 4er laboratory Data Quality Ob-ectives (DQOs). Ideal recovery ranges stated may be z aived in the event of sam4le matrix interference.

Sub7Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1774116)							
EM11065937005	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	10 mg/L	# Not Determined	p0	130
ED045G: Chloride Discrete analyser (QCLot: 1774138)							
EM11065627003	Anonymous	ED065G: Chloride	1+88p7007+	6000 mg/L	10+	p0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 1776768)							
EM11065597001	GWp	EG020A7F: Arsenic	p6607387 2	0.2 mg/L	93.2	89	139
		EG020A7F: Cadmium	p6607637 9	0.05 mg/L	113	p5	131
		EG020A7F: Cobalt	p6607687 6	0.2 mg/L	116	pp	129
		EG020A7F: Co44er	p6607507 8	0.2 mg/L	12+	p1	12p
		EG020A7F: Lead	p6397927 1	0.2 mg/L	112	p1	123
		EG020A7F: Manganese	p6397 9+7 5	0.2 mg/L	pp.9	++	132
		EG020A7F: Nickel	p6607027 0	0.2 mg/L	11+	p3	129
		EG020A7F: Zinc	p6607++7+	0.2 mg/L	119	+8	13+
EG035F: Dissolved Mercury by FIMS (QCLot: 1776767)							
EM11065597002	GW2+	EG035F: Mercury	p6397 9p7+	0.0100 mg/L	8p.2	p0	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 1778417)							
EM11065517002	Anonymous	EG050F: Hexavalent Chromium	1856072979	0.5 mg/L	9+.+	p0	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1776352)							
EM11065517002	Anonymous	EK025G: Free Cyanide	7777	0.5 mg/L	99.p	p0	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1776357)							
EM11065197001	Anonymous	EK02+G: Total Cyanide	5p71275	0.2 mg/L	112	p0	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1774001)							
EM1106180 7002	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.5 mg/L	95.5	p0	130
EK040P: Fluoride by PC Titrator (QCLot: 1773302)							
EM110653+7001	Anonymous	EK060P: Fluoride	1+98676878	5.0 mg/L	106	p0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1774137)							
EM11065627003	Anonymous	EK05pG: Nitrite as N	7777	0.5 mg/L	11p	p0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1774233)							
EM1106562700p	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.5 mg/L	98.9	p0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1774141)							
EM11065597002	GW2+	EK0p1G: Reactive Phos4horus as P	7777	0.5 mg/L	103	p0	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 1776895)							
EM11065597002	GW2+	EP0p6: 1.17Dichloroethene	p573576	20 µg/L	p+.0	56	106

Sub7Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP074E: Halogenated Aliphatic Compounds (QCLot: 1776895) - continued							
EM11065597002	GW2+	EP0p6: Trichloroethene	p97017+	20 µg/L	88.p	+2	120
EP074F: Halogenated Aromatic Compounds (QCLot: 1776895)							
EM11065597002	GW2+	EP0p6: Chloroben@ne	1087907p	20 µg/L	91.8	+8	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1776896)							
EM11065597002	GW2+	EP080: C+ 7C9 Fraction	7777	280 µg/L	81.+	51	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1776896)							
EM11065597002	GW2+	EP080: C+ 7C10 Fraction	7777	330 µg/L	86.0	p0	130
EP080: BTEXN (QCLot: 1776896)							
EM11065597002	GW2+	EP080: Ben@ne	p176372	20 µg/L	80.1	+3	131
		EP080: Toluene	10878873	20 µg/L	83.+	+5	133

QUALITY CONTROL REPORT

Work Order	: **EM1104AAm**	Page	: 1 of 16
nt eNdt eNV	: **1**		
Client	: **El RTLOI MEI HnS EnLHC 5pTEI pE5**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 6 Westall Rd S4ringvale VIC Australia 31p1
E7mail	: d-amesj eesi.bi@	E7mail	: carol.z alshj alsenviro.com
Tele4hone	: w+1 9+8p1+++	Tele4hone	: w+17378569 9+08
Facsimile	: w+1 03 9+8p1866	Facsimile	: w+17378569 9+01
Pro-ect	: 2100p6 ALBERT PARK GASWORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: 7777		
C7O7C number	: 7777	Date Sam4les Received	: 037MAY72011
Sam4ler	: 7777	Issue Date	: 307MAY72011
Order number	: 7777		
		No. of sam4les received	: 2
Quote number	: ME/015/11 V3	No. of sam4les analysed	: 2

This re4ort su4ersedes any 4revious re4ort(s) z ith this reference. Results a44ly to the sam4le(s) as submitted. All 4ages of this re4ort have been checked and a44roved for release.

This Quality Control Re4ort contains the folloz ing information:

- Laboratory Du4licate (DUP) Re4ort; Relative Percentage Difference (RPD) and Acce4tance Limits
- Method Blank (MB) and Laboratory Control S4ike (LCS) Re4ort; Recovery and Acce4tance Limits
- Matrix S4ike (MS) Re4ort; Recovery and Acce4tance Limits

NATA Accredited Laboratory 825

This document is issued in accordance z ith NATA accreditation requirements.

Accredited for com4liance z ith ISO/IEC 1p025.

Signatories

This document has been electronically signed by the authori@ed signatories indicated beloz. Electronic signing has been carried out in com4liance z ith 4rocedures s4ecified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
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General Comments

The analytical 4rocedures used by the Environmental Division have been develo4ed from established internationally recogni@d 4rocedures such as those 4ublished by the USEPA, APHA, AS and NEPM. In house develo4ed 4rocedures are em4loyed in the absence of documented standards or by client request.

Where moisture determination has been 4erformed, results are re4orted on a dry z eight basis.

Where a re4orted less than (<) result is higher than the LOR, this may be due to 4rimary sam4le extract/digestate dilution and/or insuffient sam4le for analysis.

Where the LOR of a re4orted result differs from standard LOR, this may be due to high moisture content, insufficient sam4le (reduced z eight em4loyed) or matrix interference.

Key : Anonymous = Refers to sam4les z hich are not s4ecifically 4art of this z ork order but formed 4art of the QC 4rocess lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of re4orting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Du4licate refers to a randomly selected intralaboratory s4lit. Laboratory du4licates 4rovide information regarding method 4recision and sam4le heterogeneity. The 4ermitted ranges for the Relative Percent Deviation (RPD) of Laboratory Du4licates are s4ecified in ALS Method QWI7EN/38 and are de4endent on the magnitude of results in com4arison to the level of re4orting: Result < 10 times LOR:7 No Limit; Result betz een 10 and 20 times LOR:70% 750%; Result > 20 times LOR:70% 720%.

Sub7Matrix: **WnHEL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
En00A: (C Q p SoV 18841) 4a									
EM11065517001	Anonymous	EA005: 4H Value	7777	0.01	4H Unit	+.90	+.90	0.0	0% 720%
EM11065p1700+	Anonymous	EA005: 4H Value	7777	0.01	4H Unit	p.1+	p.18	0.3	0% 720%
En01A: HoV Di svvoBed 5oDdv Q p SoV 1883P81a									
EM11065597001	GWp	EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	1+60	1++0	1.6	0% 720%
EM11065927002	Anonymous	EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	+000	5890	1.9	0% 720%
Ei 038y: n Dl BNsb 9b yp HsVl Vor Q p SoV 1883304a									
EM11065607008	Anonymous	ED03p7P: Hydroxide Alkalinity as CaCO3	DMO72107001	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Carbonate Alkalinity as CaCO3	38127327+	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Bicarbonate Alkalinity as CaCO3	p175273	1	mg/L	38p	388	0.0	0% 720%
		ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	38p	388	0.0	0% 720%
EM11065617005	Anonymous	ED03p7P: Hydroxide Alkalinity as CaCO3	DMO72107001	1	mg/L	<1	<1	0.0	No Limit
		ED03p7P: Carbonate Alkalinity as CaCO3	38127327+	1	mg/L	<1	2	0.0	No Limit
		ED03p7P: Bicarbonate Alkalinity as CaCO3	p175273	1	mg/L	3	3	0.0	No Limit
		ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	3	5	68.6	No Limit
Ei 041G: 5uDl Ve Qur9sds eVscal v 5O4) 29b i n Q p SoV 188411- a									
EM11065937006	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	392	392	0.0	0% 720%
EM11065627001	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	15p	1+3	3.8	0% 720%
Ei 04AG: phDorsde i svcreVé l NI Dover Q p SoV 188413Pa									
EM11065627001	Anonymous	ED065G: Chloride	1+88p7007+	1	mg/L	2690	3020	19.2	0% 720%
EM1106562702p	Anonymous	ED065G: Chloride	1+88p7007+	1	mg/L	1p80	1+30	8.8	0% 720%
Ei 0m3F: i svvoBed Ml jor pl VsoNv Q p SoV 1884140a									
EM11065517001	Anonymous	ED093F: Calcium	p6607p072	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	p6397957 6	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	p6607237 5	1	mg/L	1	<1	0.0	No Limit
		ED093F: Potassium	p6607097p	1	mg/L	<1	<1	0.0	No Limit
EM11065+9700+	Anonymous	ED093F: Calcium	p6607p072	1	mg/L	3+0	3++	1.p	0% 720%
		ED093F: Magnesium	p6397957 6	1	mg/L	1020	1030	0.8	0% 720%
		ED093F: Sodium	p6607237 5	1	mg/L	+5p0	+p+0	2.8	0% 720%
		ED093F: Potassium	p6607097p	1	mg/L	62p	630	0.p	0% 720%
EG0) 0F: i svvoBed MeV Dr 9b Tpy 2M5 Q p SoV 188- 8- Pa									
EM11065597001	GWp	EG020A7F: Cadmium	p6607637 9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	p6607387 2	0.001	mg/L	0.086	0.085	0.0	0% 720%
		EG020A7F: Cobalt	p6607687 6	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Co44er	p6607507 8	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub7Matrix: **WnHEL**

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Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG0) 0F: i svvoDsed MeV Dr 9b Tpy2M5 Cl p SoV 188-8-Pa 2coNV8Nued									
EM11065597001	GWp	EG020A7F: Lead	p6397927l	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	p6397+75	0.001	mg/L	0.138	0.160	1.6	0% 720%
		EG020A7F: Nickel	p6607027O	0.001	mg/L	0.00p	0.00p	0.0	No Limit
		EG020A7F: Zinc	p6607++7+	0.005	mg/L	0.02+	0.01p	60.0	No Limit
		EG020A7F: Aluminium	p6297907S	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Selenium	pp827697Z	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	p6607627B	0.05	mg/L	0.86	0.82	3.6	0% 750%
		EG020A7F: Iron	p6397897+	0.05	mg/L	0.12	0.11	12.3	No Limit
EM11065pp7001	Anonymous	EG020A7F: Cadmium	p6607637O	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A7F: Arsenic	p6607387Z	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Cobalt	p6607687O	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Co44er	p6607507B	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Lead	p6397927l	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A7F: Manganese	p6397+75	0.001	mg/L	0.015	0.009	69.2	No Limit
		EG020A7F: Nickel	p6607027O	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A7F: Zinc	p6607++7+	0.005	mg/L	0.02+	<0.005	13+	No Limit
		EG020A7F: Aluminium	p6297907S	0.01	mg/L	0.31	0.36	8.1	0% 720%
		EG020A7F: Selenium	pp827697Z	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A7F: Boron	p6607627B	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A7F: Iron	p6397897+	0.05	mg/L	0.29	0.25	13.3	No Limit
EG03AF: i svvoDsed Mercurb 9b FTM5 Cl p SoV 188-8-8a									
EM11065597001	GWp	EG035F: Mercury	p6397p7+	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EM11065987008	Anonymous	EG035F: Mercury	p6397p7+	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG0A0F: i svvoDsed Cexl 6l DeNVphrot sut Cl p SoV 188P418a									
EM11065517001	Anonymous	EG050F: Hexavalent Chromium	185607297O	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK0) AG: Free cbl Nsde 9b i svcreVé nNl Dover Cl p SoV 188-3A) a									
EM11065517001	Anonymous	EK025G: Free Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM11065pp7008	Anonymous	EK025G: Free Cyanide	7777	0.006	mg/L	0.168	0.159	+.9	0% 720%
EK0) - G: HoV Dpbl Nsde Bb i svcreVé nNl Dover Cl p SoV 188-3A8a									
EM11066257006	Anonymous	EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM1106+097002	Anonymous	EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EK0) PG: Wel k ncsd i svvocs l 9De pbl Nsde Bb i svcreVé nNl Dover Cl p SoV 1884001a									
EM11061807001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EM11061807011	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	<0.006	0.0	No Limit
EK040y: FDuorsde 9b yp HsVl Vor Cl p SoV 188330) a									
EM11065257001	Anonymous	EK060P: Fluoride	1+9867687B	0.1	mg/L	0.8	0.8	0.0	No Limit
EM110653+7001	Anonymous	EK060P: Fluoride	1+9867687B	0.1	mg/L	0.+	0.+	0.0	No Limit
EK0AAG: nt t oNsl l v l 9b i svcreVé nNl Dover Cl p SoV 1884) 34a									
EM11065517001	Anonymous	EK055G: Ammonia as N	p++67617p	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Sub7Matrix: **WnHEL**

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EK0AAG: nt t oNsl v l 9b i svcreVé nNl Dover Q p SoV 1884) 34a 2coNVéNued									
EM11065p1700+	Anonymous	EK055G: Ammonia as N	p++67617p	0.01	mg/L	1p.0	1+.2	5.0	0% 720%
EK0A8G: I svfsVé l v l 9b i svcreVé nNl Dover Q p SoV 1884138a									
EM1106562700l	Anonymous	EK05pG: Nitrite as N	7777	0.01	mg/L	0.01	0.01	0.0	No Limit
EM1106562702p	Anonymous	EK05pG: Nitrite as N	7777	0.01	mg/L	0.02	0.02	0.0	No Limit
EK0AmG: I svfsVé (Dv l svfl Vé l v l Q Oxa 9b i svcreVé nNl Dover Q p SoV 1884) 33a									
EM1106562700+	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1106551700l	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK081G: Lel cV6e yhov(horuv l v y 9b ds vcreVé l Nl Dover Q p SoV 1884141a									
EM1106559700l	GWp	EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM11065+9700+	Anonymous	EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK0PAM: 5uDsde l v 5) 2 Q p SoV 1883m Pa									
EM110660p7001	Anonymous	EK085: Sulfide as S27	1869+72578	0.1	mg/L	32.8	32.8	0.0	0% 720%
EM11066p57006	Anonymous	EK085: Sulfide as S27	1869+72578	0.1	mg/L	<0.1	<0.1	0.0	No Limit
Ey084n: MoNocbcBc nrot l Vsc Cbdrocl r9oNv Q p SoV 188- PmAa									
EM1106559700l	GWp	EP0p6: Styrene	1007627 5	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Iso4ro4ylben@ne	9878278	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: n7Pro4ylben@ne	1037+571	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.3.57Trimethylben@ne	1087+p78	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: sec7Butylben@ne	1357987 8	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.67Trimethylben@ne	957+37+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: tert7Butylben@ne	9870+7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 47Iso4ro4yltoluene	9978p7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: n7Butylben@ne	1067517 8	5	µg/L	<5	<5	0.0	No Limit
Ey084B: OxbgeNl Vsd pot (ouNdv Q p SoV 188- PmAa									
EM1106559700l	GWp	EP0p6: Vinyl Acetate	1087057 6	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 27Butanone (MEK)	p879373	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 67Methyl7274entanone (MIBK)	1087107 1	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: 27Hexanone (MBK)	5917p87+	50	µg/L	<50	<50	0.0	No Limit
Ey084p: 5uDoNl Vsd pot (ouNdv Q p SoV 188- PmAa									
EM1106559700l	GWp	EP0p6: Carbon disulfide	p571570	5	µg/L	<5	<5	0.0	No Limit
Ey084i : Fut sgl NW Q p SoV 188- PmAa									
EM1106559700l	GWp	EP0p6: 2.27Dichloro4ro4ane	5967207p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloro4ro4ane	p878p75	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.37Dichloro4ro4ylene	100+170175	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.37Dichloro4ro4ylene	100+17027+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dibromoethane (EDB)	10+79376	5	µg/L	<5	<5	0.0	No Limit
Ey084E: Cl DogeNl Vsd nB(hl Vsc pot (ouNdv Q p SoV 188- PmAa									
EM1106559700l	GWp	EP0p6: 1.17Dichloroethene	p573576	5	µg/L	<5	<5	0.0	No Limit

Sub7Matrix: **WnHEL**

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Ey084E: Cl DogeNl Ved nB(hl Vec pot (ouNdv Cl p SoV 188- PmAa 2coNVNued									
EM11065597001	GWp	EP0p6: Iodomethane	p67887 6	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.27Dichloroethene	15+7+075	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.17Dichloroethane	p573673	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.27Dichloroethene	15+75972	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.17Trichloroethane	p17557+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.17Dichloro4ro4ylene	5+37587+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Carbon Tetrachloride	5+72375	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloroethane	10p70+72	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Trichloroethene	p97017+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dibromomethane	p679573	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.27Trichloroethane	p970075	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.37Dichloro4ro4ane	16272879	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Tetrachloroethene	12p71876	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.1.27Tetrachloroethane	+307207+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: trans71.67Dichloro727butene	11075p7+	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: cis71.67Dichloro727butene	16p+71175	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.1.2.27Tetrachloroethane	p973675	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.37Trichloro4ro4ane	9+71876	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Pentachloroethane	p+7017p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dibromo737chloro4ro4ane	9+71278	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Hexachlorobutadiene	8p7+873	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dichlorodifluoromethane	p57p178	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Chloromethane	p678p73	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Vinyl chloride	p570176	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Bromomethane	p678379	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Chloroethane	p570073	50	µg/L	<50	<50	0.0	No Limit
		EP0p6: Trichlorofluoromethane	p57+976	50	µg/L	<50	<50	0.0	No Limit
Ey084F: Cl DogeNl Ved nrot l Vec pot (ouNdv Cl p SoV 188- PmAa									
EM11065597001	GWp	EP0p6: Chloroben@ne	1087907p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Bromoben@ne	10878+71	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 27Chlorotoluene	957697 8	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 67Chlorotoluene	10+76376	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.37Dichloroben@ne	5617p371	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.67Dichloroben@ne	10+76+7p	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.27Dichloroben@ne	957 5071	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.67Trichloroben@ne	12078271	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: 1.2.37Trichloroben@ne	8p7+17+	5	µg/L	<5	<5	0.0	No Limit
Ey084G: Hrshl Dot eVhl Nev Cl p SoV 188- PmAa									
EM11065597001	GWp	EP0p6: Chloroform	+p7++73	5	µg/L	<5	<5	0.0	No Limit

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Ey084G: Hrshl Dot eVhl Nev Cl p SoV 188- PmAa 2coNV6Nued									
EM11065597001	GWp	EP0p6: Bromodichloromethane	p572p76	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Dibromochloromethane	1267687 1	5	µg/L	<5	<5	0.0	No Limit
		EP0p6: Bromoform	p572572	5	µg/L	<5	<5	0.0	No Limit
Ey0P0/081: HoV DyeVoDut Cbdrocl r9oNv Cl p SoV 188- Pm a									
EM11065597001	GWp	EP080: C+ 7C9 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
Ey0P0/081: HoV DLeco6erl 9De Cbdrocl r9oNv 2l EyM) 010 i rl fV Cl p SoV 188- Pm a									
EM11065597001	GWp	EP080: C+ 7C10 Fraction	7777	20	µg/L	<20	<20	0.0	No Limit
Ey0P0: BHEXI Cl p SoV 188- Pm a									
EM11065597001	GWp	EP080: Ben@ne	p176372	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	1087 8873	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylben@ne	1007 6176	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta7& 4ara7Xylene	1087 3873 10+7627 3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho7Xylene	9576p7+	2	µg/L	<2	<2	0.0	No Limit
		EP080: Na4hthalene	917207 3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to z hich all reagents are added in the same volumes or 4ro4ortions as used in standard sam4le 4re4aration. The 4ur4ose of this QC 4arameter is to monitor 4otential laboratory contamination. The quality control term Laboratory Control Sam4le (LCS) refers to a certified reference material, or a knoz n interference free matrix s4iked z ith target analytes. The 4ur4ose of this QC 4arameter is to monitor method 4recision and accuracy inde4endent of sam4le matrix. Dynamic Recovery Limits are based on statistical evaluation of 4rocessed LCS.

Sub7Matrix: **WnHEL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
En01A: HoV Di svvoBed 5oBdv Q7pSoV 1883P81a								
EA015H: Total Dissolved Solids j 180°C	GIS72107010	5	mg/L	<5	2000 mg/L	101	98	106
Ei 038y: nDkl BNsb 9b yp HsVl Vor Q7pSoV 1883304a								
ED03p7P: Total Alkalinity as CaCO3	7777	1	mg/L	7777	200 mg/L	92.5	pp	12p
Ei 041G: 5uDl Vé Qlur9sds: eVrscal v 5O4) 29b i n Q7pSoV 188411- a								
ED061G: Sulfate as SO6 7Turbidimetric	168087p978	1	mg/L	<1	12.5 mg/L	9p.+	81	125
Ei 04AG: phDorsde i svcreVé l NI Dover Q7pSoV 188413Pa								
ED065G: Chloride	1+88p7007+	1	mg/L	<1	1000 mg/L	111	89	11p
Ei 0n3F: i svvoBed MI jor pl VsoNv Q7pSoV 1884140a								
ED093F: Calcium	p6607p072	1	mg/L	<1	5 mg/L	116	81	129
ED093F: Magnesium	p6397957 6	1	mg/L	<1	5 mg/L	10p	80	120
ED093F: Sodium	p6607237 5	1	mg/L	<1	50 mg/L	105	p8	126
ED093F: Potassium	p660709 7p	1	mg/L	<1	50 mg/L	119	p9	121
EG0) 0F: i svvoBed MeV Dr 9b Tpy2M5 Q7pSoV 188- 8- Pa								
EG020A7F: Aluminium	p6297907 5	0.01	mg/L	<0.01	0.5 mg/L	102	80	120
EG020A7F: Arsenic	p6607387 2	0.001	mg/L	<0.001	0.1 mg/L	93.+	8p	109
EG020A7F: Cadmium	p6607637 9	0.0001	mg/L	<0.0001	0.1 mg/L	96.3	88	110
EG020A7F: Cobalt	p6607687 6	0.001	mg/L	<0.001	0.1 mg/L	92.5	8p	111
EG020A7F: Co44er	p6607507 8	0.001	mg/L	<0.001	0.1 mg/L	90.6	8+	108
EG020A7F: Lead	p6397927 1	0.001	mg/L	<0.001	0.1 mg/L	100	90	110
EG020A7F: Manganese	p6397+75	0.001	mg/L	<0.001	0.1 mg/L	93.1	8p	111
EG020A7F: Nickel	p6607027 0	0.001	mg/L	<0.001	0.1 mg/L	92.2	8+	112
EG020A7F: Selenium	pp827697 2	0.01	mg/L	<0.01	0.1 mg/L	95.2	83	111
EG020A7F: Zinc	p6607++7+	0.005	mg/L	<0.005	0.1 mg/L	95.+	8+	120
EG020A7F: Boron	p6607627 8	0.05	mg/L	<0.05	0.1 mg/L	106	+1	133
EG020A7F: Iron	p6397897+	0.05	mg/L	<0.05	0.5 mg/L	95.2	p9	119
EG03AF: i svvoBed Mercurb 9b FTM5 Q7pSoV 188- 8- 8a								
EG035F: Mercury	p63979p7+	0.0001	mg/L	<0.0001	0.0100 mg/L	90.+	p1	125
EG0A0F: i svvoBed Cexl 6l DeNVphrot sut Q7pSoV 188P418a								
EG050F: Hexavalent Chromium	1856072979	0.01	mg/L	<0.01	0.5 mg/L	102	80	120
EK0) AG: Free cbl Nsde 9b i svcreVé nNI Dover Q7pSoV 188- 3A) a								
EK025G: Free Cyanide	7777	0.006	mg/L	<0.006	0.5 mg/L	p9.6	p3	111
EK0) - G: HoV Dpbl Nsde Bb i svcreVé nNI Dover Q7pSoV 188- 3A8a								
EK02+G: Total Cyanide	5p71275	0.006	mg/L	<0.006	0.2 mg/L	111	85	125

Sub7Matrix: **WnHEL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK0) PG: Wel k ncsd i svvocsl 9De pbl Nsde Bb i svcreVé nNl Dover Q pSoV. 1884001a								
EK028G: Weak Acid Dissociable Cyanide	7777	0.006	mg/L	<0.006	0.5 mg/L	p9.8	+6	106
EK040y: FDiorsde 9b yp HsVl Vor Q pSoV. 188330) a								
EK060P: Fluoride	1+9867687	0.1	mg/L	<0.1	5 mg/L	99.+	p8	120
EK0AAG: nt t oNsl v l 9b i svcreVé nNl Dover Q pSoV. 1884) 34a								
EK055G: Ammonia as N	p++67617p	0.01	mg/L	<0.01	0.5 mg/L	96.p	p+	122
EK0A8G: I sVsVé l v l 9b i svcreVé nNl Dover Q pSoV. 1884138a								
EK05pG: Nitrite as N	7777	0.01	mg/L	<0.01	0.5 mg/L	89.9	86	112
EK0AmG: I sVsVé (Duv l sVl Vé l v l Q Oxa 9b i svcreVé nNl Dover Q pSoV. 1884) 33a								
EK059G: Nitrite wNitrate as N	7777	0.01	mg/L	<0.01	0.5 mg/L	9+.2	p3	12p
EK081G: Lel cV6e yhov(horuv l v y 9b ds vcreVé l Nl Dover Q pSoV. 1884141a								
EK0p1G: Reactive Phos4horus as P	7777	0.01	mg/L	<0.01	0.5 mg/L	95.6	86	108
EK0PAM: 5uDsde l v 5) 2 Q pSoV. 1883m Pa								
EK085: Sulfide as S27	1869+72578	0.10	mg/L	<0.1	0.5 mg/L	95.0	82	11+
Ey084n: MoNocbcBc nrot l Vsc Cbdrocl r9oNv Q pSoV. 188- PmAa								
EP0p6: Styrene	1007627 5	5	µg/L	<5	20 µg/L	105	p6	122
EP0p6: Iso4ro4ylben@ene	987827 8	5	µg/L	<5	20 µg/L	105	80	120
EP0p6: n7Pro4ylben@ene	1037+571	5	µg/L	<5	20 µg/L	91.2	p0	120
EP0p6: 1.3.57Trimethylben@ene	1087+p78	5	µg/L	<5	20 µg/L	93.3	p1	119
EP0p6: sec7Butylben@ene	1357987 8	5	µg/L	<5	20 µg/L	95.6	p2	120
EP0p6: 1.2.67Trimethylben@ene	957+37+	5	µg/L	<5	20 µg/L	96.p	p3	119
EP0p6: tert7Butylben@ene	987 0+7+	5	µg/L	<5	20 µg/L	96.3	p3	119
EP0p6: 47Iso4ro4yltoluene	997 8p7+	5	µg/L	<5	20 µg/L	95.1	p1	121
EP0p6: n7Butylben@ene	1067517 8	5	µg/L	<5	20 µg/L	9+.3	+5	121
Ey084B: OxbgeNl Ved pot (ouNdv Q pSoV. 188- PmAa								
EP0p6: Vinyl Acetate	1087057 6	50	µg/L	<50	200 µg/L	99.+	5p	131
EP0p6: 27Butanone (MEK)	p879373	50	µg/L	<50	200 µg/L	111	+9	135
EP0p6: 67Methyl7274entanone (MIBK)	1087107 1	50	µg/L	<50	200 µg/L	111	+8	13+
EP0p6: 27Hexanone (MBK)	5917p87+	50	µg/L	<50	200 µg/L	111	+8	138
Ey084p: 5uDoNl Ved pot (ouNdv Q pSoV. 188- PmAa								
EP0p6: Carbon disulfide	p571570	5	µg/L	<5	20 µg/L	90.6	+p	12p
Ey084i : Fut sgl Nv Q pSoV. 188- PmAa								
EP0p6: 2.27Dichloro4ro4ane	5967207p	5	µg/L	<5	20 µg/L	9+.1	59	128
EP0p6: 1.27Dichloro4ro4ane	p878p75	5	µg/L	<5	20 µg/L	100	pp	121
EP0p6: cis71.37Dichloro4ro4ylene	100+170175	5	µg/L	<5	20 µg/L	100	p0	118
EP0p6: trans71.37Dichloro4ro4ylene	100+17027+	5	µg/L	<5	20 µg/L	95.8	++	120
EP0p6: 1.27Dibromoethane (EDB)	10+79376	5	µg/L	<5	20 µg/L	10+	p8	126
Ey084E: Cl DogeNl Ved nB(hl Vsc pot (ouNdv Q pSoV. 188- PmAa								

Sub7Matrix: **WnHEL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Ey084E: Cl DogeNl Ved nB(hl Vc pot (ouNdv Cl pSoV 188-PmAa 2coNVENued								
EP0p6: Dichlorodifluoromethane	p57p178	50	µg/L	<50	200 µg/L	82.0	58	168
EP0p6: Chloromethane	p678p73	50	µg/L	<50	200 µg/L	8+.0	+2	162
EP0p6: Vinyl chloride	p5701?6	50	µg/L	<50	200 µg/L	p8.2	+1	161
EP0p6: Bromomethane	p678379	50	µg/L	<50	200 µg/L	81.8	5p	131
EP0p6: Chloroethane	p57007?	50	µg/L	<50	200 µg/L	99.p	+6	138
EP0p6: Trichlorofluoromethane	p57+976	50	µg/L	<50	200 µg/L	9+.0	+p	131
EP0p6: 1.17Dichloroethene	p573576	5	µg/L	<5	20 µg/L	9+.2	p1	125
EP0p6: Iodomethane	p678876	5	µg/L	<5	20 µg/L	9+.0	+1	135
EP0p6: trans71.27Dichloroethene	15+7+075	5	µg/L	<5	20 µg/L	98.8	p5	121
EP0p6: 1.17Dichloroethane	p573673	5	µg/L	<5	20 µg/L	101	pp	121
EP0p6: cis71.27Dichloroethene	15+75972	5	µg/L	<5	20 µg/L	100	p8	122
EP0p6: 1.1.17Trichloroethane	p17557+	5	µg/L	<5	20 µg/L	95.1	p0	120
EP0p6: 1.17Dichloro4ro4ylene	5+37587+	5	µg/L	<5	20 µg/L	99.1	p6	122
EP0p6: Carbon Tetrachloride	5+72375	5	µg/L	<5	20 µg/L	8+.2	5p	123
EP0p6: 1.27Dichloroethane	10p70+72	5	µg/L	<5	20 µg/L	99.6	p5	125
EP0p6: Trichloroethene	p97017+	5	µg/L	<5	20 µg/L	101	pp	121
EP0p6: Dibromomethane	p679573	5	µg/L	<5	20 µg/L	102	p+	122
EP0p6: 1.1.27Trichloroethane	p970075	5	µg/L	<5	20 µg/L	112	p8	12+
EP0p6: 1.37Dichloro4ro4ane	1627879	5	µg/L	<5	20 µg/L	109	p9	125
EP0p6: Tetrachloroethene	12p71876	5	µg/L	<5	20 µg/L	10+	p+	122
EP0p6: 1.1.1.27Tetrachloroethane	+307207+	5	µg/L	<5	20 µg/L	9p.+	+5	119
EP0p6: trans71.67Dichloro727butene	11075p7+	5	µg/L	<5	20 µg/L	91.5	6+	12+
EP0p6: cis71.67Dichloro727butene	16p+71175	5	µg/L	<5	20 µg/L	103	56	132
EP0p6: 1.1.2.27Tetrachloroethane	p973675	5	µg/L	<5	20 µg/L	116	p5	131
EP0p6: 1.2.37Trichloro4ro4ane	9+71876	5	µg/L	<5	20 µg/L	123	p5	133
EP0p6: Pentachloroethane	p+7017p	5	µg/L	<5	20 µg/L	83.1	6+	118
EP0p6: 1.27Dibromo737chloro4ro4ane	9+71278	5	µg/L	<5	20 µg/L	10+	56	126
EP0p6: Hexachlorobutadiene	8p7+873	5	µg/L	<5	20 µg/L	89.+	50	136
Ey084F: Cl DogeNl Ved nrot l Vc pot (ouNdv Cl pSoV 188-PmAa								
EP0p6: Chloroben@ne	1087907p	5	µg/L	<5	20 µg/L	108	81	121
EP0p6: Bromoben@ne	10878+71	5	µg/L	<5	20 µg/L	9p.8	p5	119
EP0p6: 27Chlorotoluene	9576978	5	µg/L	<5	20 µg/L	93.2	p3	121
EP0p6: 67Chlorotoluene	10+76376	5	µg/L	<5	20 µg/L	96.8	p2	120
EP0p6: 1.37Dichloroben@ne	5617p371	5	µg/L	<5	20 µg/L	105	p3	119
EP0p6: 1.67Dichloroben@ne	10+76+7p	5	µg/L	<5	20 µg/L	105	p6	120
EP0p6: 1.27Dichloroben@ne	9575071	5	µg/L	<5	20 µg/L	106	p8	118
EP0p6: 1.2.67Trichloroben@ne	12078271	5	µg/L	<5	20 µg/L	9p.2	5+	128
EP0p6: 1.2.37Trichloroben@ne	8p7+17+	5	µg/L	<5	20 µg/L	101	+9	123
Ey084G: HrshlDot eVhl Nev Cl pSoV 188-PmAa								

Sub7Matrix: **WnHEL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)
				Result	Concentration	LCS	Low	High
Ey084G: Hrshl Dot eVhl Nev Ql pSoV 188- PmAa 2coNVsNued								
EP0p6: Chloroform	+p7++73	5	µg/L	<5	20 µg/L	100	pp	121
EP0p6: Bromodichloromethane	p572p76	5	µg/L	<5	20 µg/L	95.2	+9	11p
EP0p6: Dibromochloromethane	1267687l	5	µg/L	<5	20 µg/L	9+.+	59	119
EP0p6: Bromoform	p572572	5	µg/L	<5	20 µg/L	96.1	69	121
Ey08AG5TMaB: yoDoNucDel r nrot l Vsc Cbdrocl r9oNv Ql pSoV 188- - 4Pa								
EP0p5(SIM): Na4hthalene	9172073	1	µg/L	<1.0	5 µg/L	50.+	2p.5	126
EP0p5(SIM): Acena4hthylene	20879+78	1	µg/L	<1.0	5 µg/L	+0.3	35	129
EP0p5(SIM): Acena4hthene	8373279	1	µg/L	<1.0	5 µg/L	51.0	35	12p
EP0p5(SIM): Fluorene	8+7p37p	1	µg/L	<1.0	5 µg/L	55.0	3+	130
EP0p5(SIM): Phenanthrene	8570178	1	µg/L	<1.0	5 µg/L	59.8	62	132
EP0p5(SIM): Anthracene	1207127p	1	µg/L	<1.0	5 µg/L	5p.8	62	132
EP0p5(SIM): Fluoranthene	20+76670	1	µg/L	<1.0	5 µg/L	+6.0	61	161
EP0p5(SIM): Pyrene	1297007O	1	µg/L	<1.0	5 µg/L	++.p	60	162
EP0p5(SIM): Ben@a)anthracene	5+75573	1	µg/L	<1.0	5 µg/L	8p.2	33	153
EP0p5(SIM): Chrysene	2187O179	1	µg/L	<1.0	5 µg/L	++.8	3p	165
EP0p5(SIM): Ben@(b)fluoranthene	2057997O	1	µg/L	<1.0	5 µg/L	86.8	35	151
EP0p5(SIM): Ben@(k)fluoranthene	20p70879	1	µg/L	<1.0	5 µg/L	+3.3	39	161
EP0p5(SIM): Ben@(a)4yrene	5073278	0.5	µg/L	<0.5	5 µg/L	p0.0	61	139
EP0p5(SIM): Indeno(1.2.3.cd)4yrene	19373975	1	µg/L	<1.0	5 µg/L	++.p	35	161
EP0p5(SIM): Diben@a.h)anthracene	537p073	1	µg/L	<1.0	5 µg/L	++.9	3+	162
EP0p5(SIM): Ben@(g.h.i)4erylene	1917267O	1	µg/L	<1.0	5 µg/L	+8.1	10	162
Ey0P0/081: HoVl DyeVolDut Cbdrocl r9oNv Ql pSoV 188- - 4- a								
EP0p1: C10 7C16 Fraction	7777	50	µg/L	<50	5660 µg/L	9p.6	+6	126
EP0p1: C15 7C28 Fraction	7777	100	µg/L	<100	1p826 µg/L	85.5	p0	130
EP0p1: C29 7C3+ Fraction	7777	50	µg/L	<50	3+96 µg/L	88.2	+8	128
Ey0P0/081: HoVl DyeVolDut Cbdrocl r9oNv Ql pSoV 188- Pm- a								
EP080: C+ 7C9 Fraction	7777	20	µg/L	<20	320 µg/L	102	p2	13+
Ey0P0/081: HoVl DLeco6erl 9De Cbdrocl r9oNv 2l EyM) 010 i rl fV Ql pSoV 188- - 4- a								
EP0p1: >C10 7C1+ Fraction	7777	100	µg/L	<100	10320 µg/L	p5.2	p0	130
EP0p1: >C1+ 7C36 Fraction	7777	100	µg/L	<100	1++60 µg/L	85.9	p0	130
EP0p1: >C36 7C60 Fraction	7777	100	µg/L	<100	1080 µg/L	98.1	p0	130
Ey0P0/081: HoVl DLeco6erl 9De Cbdrocl r9oNv 2l EyM) 010 i rl fV Ql pSoV 188- Pm- a								
EP080: C+ 7C10 Fraction	7777	20	µg/L	<20	3p0 µg/L	102	p0	130
Ey0P0: BHEXl Ql pSoV 188- Pm- a								
EP080: Ben@ne	p176372	1	µg/L	<1	20 µg/L	98.5	p3	12p
EP080: Toluene	10878873	2	µg/L	<2	20 µg/L	101	p6	128
EP080: Ethylben@ne	1007617O	2	µg/L	<2	20 µg/L	9p.5	p2	12+

Sub7Matrix: **WnHEL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
Ey0P0: BHEXI Q' pSoV 188- Pm a 2coNVeNued								
EP080: meta7& 4ara7Xylene	1087387 3 10+76273	2	µg/L	<2	60 µg/L	106	+9	133
EP080: ortho7Xylene	9576p7+	2	µg/L	<2	20 µg/L	98.8	p6	128
EP080: Na4hthalene	9172073	5	µg/L	<5	5 µg/L	90.2	p0	130

Matrix Spike (MS) Report

The quality control term Matrix S4ike (MS) refers to an intralaboratory s4lit sam4le s4iked z ith a re4resentative set of target analytes. The 4ur4ose of this QC 4arameter is to monitor 4otential matrix effects on analyte recoveries. Static Recovery Limits as 4er laboratory Data Quality Ob-ectives (DQOs). Ideal recovery ranges stated may be z aived in the event of sam4le matrix interference.

Sub7Matrix: **WnHEL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
Ei 041G: 5uDl Ve Qhur9sdst eVrscal v 5O4) 29b i n Cl pSoV. 188411- a							
EM11065937005	Anonymous	ED061G: Sulfate as SO6 7Turbidimetric	168087p978	10 mg/L	# Not Determined	p0	130
Ei 04AG: phDorsde i svcreVé l Nl Dover Cl pSoV. 188413Pa							
EM11065627003	Anonymous	ED065G: Chloride	1+88p7007+	6000 mg/L	10+	p0	130
EG0) 0F: i svvoBed MeV Dr 9b Tpy2M5 Cl pSoV. 188- 8- Pa							
EM11065597001	GWp	EG020A7F: Arsenic	p6607387 2	0.2 mg/L	93.2	89	139
		EG020A7F: Cadmium	p6607637 9	0.05 mg/L	113	p5	131
		EG020A7F: Cobalt	p6607687 6	0.2 mg/L	116	pp	129
		EG020A7F: Co44er	p6607507 8	0.2 mg/L	12+	p1	12p
		EG020A7F: Lead	p6397927 l	0.2 mg/L	112	p1	123
		EG020A7F: Manganese	p6397 9+7 5	0.2 mg/L	pp.9	++	132
		EG020A7F: Nickel	p6607027 0	0.2 mg/L	11+	p3	129
		EG020A7F: Zinc	p6607++7+	0.2 mg/L	119	+8	13+
EG03AF: i svvoBed Mercurb 9b FTM5 Cl pSoV. 188- 8- 8a							
EM11065597002	GW2+	EG035F: Mercury	p63979p7+	0.0100 mg/L	8p.2	p0	130
EG0A0F: i svvoBed Cexl 6l DeNVphrot sut Cl pSoV. 188P418a							
EM11065517002	Anonymous	EG050F: Hexavalent Chromium	1856072979	0.5 mg/L	9+.+	p0	130
EK0) AG: Free cbl Nsde 9b i svcreVé nNl Dover Cl pSoV. 188- 3A) a							
EM11065517002	Anonymous	EK025G: Free Cyanide	7777	0.5 mg/L	99.p	p0	130
EK0) - G: HoV Dpbl Nsde Bb i svcreVé nNl Dover Cl pSoV. 188- 3A8a							
EM11065197001	Anonymous	EK02+G: Total Cyanide	5p71275	0.2 mg/L	112	p0	130
EK0) PG: Wel k ncsd i svvocsl 9De pbl Nsde Bb i svcreVé nNl Dover Cl pSoV. 1884001a							
EM1106180 7002	Anonymous	EK028G: Weak Acid Dissociable Cyanide	7777	0.5 mg/L	95.5	p0	130
EK040y: FDuorsde 9b yp HsVl Vor Cl pSoV. 188330) a							
EM110653+7001	Anonymous	EK060P: Fluoride	1+9867 6878	5.0 mg/L	106	p0	130
EK0AAG: nt t oNsl l v l 9b i svcreVé nNl Dover Cl pSoV. 1884) 34a							
EM11065517002	Anonymous	EK055G: Ammonia as N	p++67617p	0.5 mg/L	105	p0	130
EK0A8G: I svrsVé l v l 9b i svcreVé nNl Dover Cl pSoV. 1884138a							
EM11065627003	Anonymous	EK05pG: Nitrite as N	7777	0.5 mg/L	11p	p0	130
EK0AmG: I svrsVé (Duv l svrl Vé l v l Ql Oxa 9b i svcreVé nNl Dover Cl pSoV. 1884) 33a							
EM1106562700p	Anonymous	EK059G: Nitrite w Nitrate as N	7777	0.5 mg/L	98.9	p0	130
EK081G: Lel cV6e yhov(horuv l v y 9b ds vcreVé l Nl Dover Cl pSoV. 1884141a							
EM11065597002	GW2+	EK0p1G: Reactive Phos4horus as P	7777	0.5 mg/L	103	p0	130

Sub7Matrix: **WnHEL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
Ey084E: Cl DogeNl Ved nD(hl Vec pot (ouNdv Cf pSoV 188-PmAa							
EM11065597002	GW2+	EP0p6: 1.17Dichloroethene	p573576	20 µg/L	p+.0	56	106
		EP0p6: Trichloroethene	p97017+	20 µg/L	88.p	+2	120
Ey084F: Cl DogeNl Ved nrot l Vec pot (ouNdv Cf pSoV 188-PmAa							
EM11065597002	GW2+	EP0p6: Chloroben@ene	1087907p	20 µg/L	91.8	+8	132
Ey0P0/081: HoV DyeVoD2ut Cbdrocl r9oNv Cf pSoV 188-Pm-a							
EM11065597002	GW2+	EP080: C+ 7C9 Fraction	7777	280 µg/L	81.+	51	125
Ey0P0/081: HoV DLeco6erl 9De Cbdrocl r9oNv 2l EyM)010 i rl fV Cf pSoV 188-Pm-a							
EM11065597002	GW2+	EP080: C+ 7C10 Fraction	7777	330 µg/L	86.0	p0	130
Ey0P0: BHEXl Cf pSoV 188-Pm-a							
EM11065597002	GW2+	EP080: Ben@ene	p176372	20 µg/L	80.1	+3	131
		EP080: Toluene	10878873	20 µg/L	83.+	+5	133

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104559**	Page	: 1 of 10
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
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Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GASWORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 03-MAY-2011
Sampler	: ----	Issue Date	: 30-MAY-2011
Order number	: ----		
		No. of samples received	: 2
Quote number	: ME/015/11 V3	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**----**	----	----	**05-MAY-2011**	02-MAY-2011	×
EA015: Total Dissolved Solids								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**----**	----	----	**05-MAY-2011**	09-MAY-2011	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	16-MAY-2011	----	**04-MAY-2011**	16-MAY-2011	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**07-MAY-2011**	30-MAY-2011	✓
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**07-MAY-2011**	30-MAY-2011	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	09-MAY-2011	----	**06-MAY-2011**	09-MAY-2011	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	29-OCT-2011	----	**09-MAY-2011**	29-OCT-2011	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**09-MAY-2011**	30-MAY-2011	✓
EG050F: Dissolved Hexavalent Chromium								
Clear Plastic Bottle - NaOH								
GW7,	GW26	**02-MAY-2011**	**----**	----	----	**09-MAY-2011**	30-MAY-2011	✓
EK025G: Free cyanide by Discrete Analyser								
White Plastic Bottle-NaOH								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
GW7,	GW26	**02-MAY-2011**	**05-MAY-2011**	16-MAY-2011	✓	**05-MAY-2011**	16-MAY-2011	✓
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**04-MAY-2011**	30-MAY-2011	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**06-MAY-2011**	30-MAY-2011	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	04-MAY-2011	----	**04-MAY-2011**	04-MAY-2011	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
GW7,	GW26	**02-MAY-2011**	**---**	30-MAY-2011	----	**09-MAY-2011**	30-MAY-2011	✓
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**---**	04-MAY-2011	----	**04-MAY-2011**	04-MAY-2011	✓
EK085M: Sulfide as S2-								
Clear Plastic Bottle - Natural								
GW7,	GW26	**02-MAY-2011**	**----**	----	----	**05-MAY-2011**	03-MAY-2011	×
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP074B: Oxygenated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP074C: Sulfonated Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP074D: Fumigants								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP074G: Trihalomethanes								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	09-MAY-2011	✓	**09-MAY-2011**	15-JUN-2011	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	09-MAY-2011	✓	**09-MAY-2011**	15-JUN-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	09-MAY-2011	✓	**09-MAY-2011**	15-JUN-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓
EP080: BTEXN								
Amber VOC Vial- NaHSO4 or H2SO4								
GW7,	GW26	**02-MAY-2011**	**06-MAY-2011**	16-MAY-2011	✓	**06-MAY-2011**	16-MAY-2011	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	2	**50.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	**50.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TPH Volatiles/BTEX	EP080	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfide as S2-	EK085	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Hexavalent Chromium - Dissolved	EG050F	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	2	**50.0**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	**50.0**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Hexavalent Chromium - Dissolved	EG050F	WATER	APHA 21st ed., 3500 Cr-B. Samples are 0.45 um filtered prior to analysis. Hexavalent chromium is determined on filtered water sample as received by pH adjustment and colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide By Discrete Analyser	EK026G	WATER	APHA 21st ed., 4500-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500-NO3- F. Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfide as S2-	EK085	WATER	APHA 21st ed., 4500-S2- D Sulfide species present in water samples are immediately precipitated when collected in pretreated caustic/zinc acetate preserved sample containers. After the supernatant is discarded, the resultant precipitate is then coloured using methylene blue indicator and measured using UV-VIS detection at 664nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and ICPAES	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by ICPAES. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

Preparation Methods	Method	Matrix	Method Descriptions
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Cyanide	EK026-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1104593-005	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA005: pH						
Clear Plastic Bottle - Natural						
GW7, GW26	----	----	----	05-MAY-2011	02-MAY-2011	**3**
EK085M: Sulfide as S2-						
Clear Plastic Bottle - Natural						
GW7, GW26	----	----	----	05-MAY-2011	03-MAY-2011	**2**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104608**	: s g	o1f3lf4
i egvy	o**ENVIRONMENTAL EARTH SCIENCES**	bsr3tsy8tC	oEvmt3vDgvysefummP3vfMger3ctvg
i 3vysRy	oMAfuVI JufSVMEW	i 3vysRy	oi st3eh seRd
V..tgPP	o: ØBOXB2ff55TY I BB, WI AVUfI J pV7W, AVbJVfY011	V..tgPP	o4fh gPyseeA. fW-tnv nsegfl J fVcPytsesfY1j1
E@sne	o.zsDgPw ggPh0n+	E@sne	oRst3e0sePdw seRgvmt30R3D
, geg-d3vg	o9F1f8Faj 1FFF	, geg-d3vg	o9F1@@T48f8F0a
I sRPhDneg	o9F1f0Yf8Faj 1a44	I sRPhDneg	o9F1@@T48f8F01
: t3zgRy	o5100j 4fVbXEA, f: VAKfGVWfh BAKWfffAEXV, i QfBI f EM1104104fVNufEM11041F1	(i fbgnge	oNE: Mf1888ffWRdg.cegfX)YqfsV.fVbWf(i WYftg/cntgDgvy
Bt.gtfvcDrgt	o@@@@		
i @@fvcDrgt	o@@@@	usygfWsD-egPfAgRgnng.	o04@IVU@011
WsD-egt	o@@@@	JPPcgfusyg	o1Y@IVU@011
Wyg	o@@@@		
		N30l3LfPsD-egPftgRgnng.	oT
(c3ygfvcDrgt	oMEK01Tk11fI Y	N30l3LfPsD-egPfsvseCPg.	oT

, dnPf tg-3tyf Pc-gtPg.gPf svCf-tgm8cPf tg-3ty)Pqf 6 ydf ydnPf tgLgtgvRg0 AgPceyPf s--eCf y3f ydgf PsD-eg)Pqf sPf PcrDnyg.0 Veef-s gPf 3Lf ydnPf tg-3tyf dsngf rggvf RdgR+g.f sv.f s--t3ng.f L3t tgegsPg0

, dnPfi gtyndRsygf3LfVvseCPnPfR3vysnvPfydgfL3ee86nv fnvL3tDsyt8vo

- GgvgtsefI 3DDgvyP
- VvseCynRseAgPceyP
- Wctt3 sygfi 3vyt3eBnDnyP

NATA
WORLD RECOGNISED ACCREDITATION

NV, VfVRRtg.ng.fbsr3tsy8tCfa5T
f
, dnPf.3RcDgvyfnPfnPPcg.fnvf
sRR3t.svRgf6ydfNV, Vf
sRRtg.nsy8vftg/cntgDgvyPO

VRRtg.ng.fL3tfR3D-eesvRgf6ydf
JWBkEi f1j05TO

Signatories

, dnPf .3RcDgvyf dsPf rggvf gegRyt3vnRseCf Pnvg.f rCf ydgf scyd3tn+g.f Pnvsy8tngPf nv.nRsyg.f rge86 0 EegRyt3vnRf Pnvnv f dsPf rggv Rsttng.f3cyfnvfR3D-eesvRgf6ydf-t3Rg.ctgPfP-gRtdg.fnvf51fi I Af: styf11O

Signatories	*Position*	*Accreditation Category*
NsvRCfh sv	Wgvr8tfWgDnn8esynegfJvPytcDgvyfi dgDnPy	Mger3ctvgfBt svnRP

: s g	o 5f3Lf4
h 3tHfBt. gt	o EM1104F0a
i egvy	o ENl JABNMEN, VbfEVA, QfW JENi EW
: t3zgRy	o 5100j 4fVbXEA, f: VAKfGVWfh BAKWffAEXV, i QfBI fEM1104104fVNu fEM11041F1

General Comments

, dgf svseQyRsf - t3Rg. ctgPf cPg. f r Cf ydgf Evmn3vDgvysef u mmR3vf dsmgf r ggvf . gmge3- g. f Lt3Df gPysr eRdg. f nvygtvsy3vsexCf tgR3 vn+g. f - t3Rg. ctgPf PcRdf sPf yd3Pgf - cr eRdg. f r Cf ydgf 7 WE: Vpf V: QVpf VWf sv. f NE: MCf Jvf d3cPg
. gmge3- g. f- t3Rg. ctgPfstgfgD - e3Cg. fnvfydgfsr PgvRgf3Lf. 3RcDgvyg. fPysv. st. Pf3tfr CfRegvyftg/ cgPyO

h dgtgfD3nPyctgf. gygtDnvsy3vfdsPfr ggvf- gtL3tDg. pftgPceyPfstgftg- 3tyg. f3vfsf. tCf6gn dyfr sPnPO

h dgtgfsftg- 3tyg. fegPPfydsvf)<qftgPceyfnPfdn dgtfydsvfydgfbBApfydnPfDsCfr gf. cgfy3f- tnDstCfPsD - egfgxytsRyk n gPysygf. nce y3vfsv. k3tfnvPcLugvyfPsD - egfL3tfsvseCPnPO

h dgtgfydgfbBAf3Lfsftg- 3tyg. ftgPceyf. nLgtPfLt3DfPysv. st. fbBApfydnPfDsCfr gf. cgfy3fdn dfD3nPyctgfR3vygvyp fnvPcLunRegvyfPsD - egf)tg. cRg. f6gn dyfgD - e3Cg. qf3tfDsytnxfnvygtLgtgvRgO

h dgvfPsD - ev fyrDgfnvL3tDsy3vfnPfv3yf- t3mn g. fr Cfydgf Reegvyp PsD - ev f. sygPfstgfPd36 vf6nyd3cyfsfyrDgfR3D - 3vgvyfJvfydgPgfnvPysvRgPpfydgfyrDgfR3D - 3vgvyfdsPfr ggvfsPPcDg. fr Cfydgfesr 3tsy3tCfL3tf- t3RgPPnv f- ct- 3PgPO

KgCfo i VWfNcDr gtf=fi VWftg nPytCfvcDr gtfLt3Df. sysr sPgfDsnvysnvg. fr Cfi dgDnRseVr PytsRyPfWgtmnRgPCf dgfi dgDnRseVr PytsRyPfWgtmnRgfnPfsf. mnP3vf3LfydgfVDgtnRsvfi dgDnRseW3RegyCO
bBAf=fbnDnyf3Lftg- 3tyv
^f=f, dnPftgPceyfnPfR3D - cyg. fLt3Dfnv. mnn cse fsvseCygf. gygRy3vPfsyf3tfsr 3ngfydgfegnnge f3Lftg- 3tyv

Analytical Results

Wcr@lsytnx: WATER			Client sample ID	GW1	GW35	GW8	GW38	GW37
			Client sampling date / time	1a@: A@011f1T00	1a@: A@011f1T00	18@: A@011f1T00	18@: A@011f1T00	18@: A@011f1T00
Compound	CAS Number	LOR	Unit	EM1104608-001	EM1104608-002	EM1104608-003	EM1104608-004	EM1104608-005
EP070: Total Petroleum Hydrocarbons - Speciation								
Aromatic C10-C14	@@@	T0	% kb	@@@	@@@	<T0	480	300
Aromatic C15-C28	@@@	100	% kb	@@@	@@@	<100	200	<100
Aromatic C29-C36	@@@	T0	% kb	@@@	@@@	<T0	<T0	<T0
Aliphatic C10-C14	@@@	T0	% kb	@@@	@@@	<T0	<T0	<T0
Aliphatic C15-C28	@@@	100	% kb	@@@	@@@	<100	<100	<100
Aliphatic C29-C36	@@@	T0	% kb	@@@	@@@	<T0	<T0	<T0
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	@@@	T0	% kb	<100	<100	160	1090	410
C15 - C28 Fraction	@@@	100	% kb	<500	<500	<100	210	120
C29 - C36 Fraction	@@@	T0	% kb	<100	<100	<T0	<T0	<T0
^ C10 - C36 Fraction (sum)	@@@	T0	% kb	<100	<100	160	1300	530
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	@@@	100	% kb	<500	<500	200	1090	440
>C16 - C34 Fraction	@@@	100	% kb	<500	<500	<100	170	<100
>C34 - C40 Fraction	@@@	100	% kb	<500	<500	<100	<100	<100
^ >C10 - C40 Fraction (sum)	@@@	100	% kb	<500	<500	200	1260	440
EP070S:TPH Surrogates - Speciation								
2-Fluorobiphenyl	Y51@0@	0C	µ	@@@	@@@	95.4	96.3	97.1
2-Bromonaphthalene	Ta0@Y@	0C	µ	@@@	@@@	92.2	84.0	87.2

Surrogate Control Limits

Wcr @Msytnx: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP070S:TPH Surrogates - Speciation			
2-Fluorobiphenyl	Y51@0@	T5	144
2-Bromonaphthalene	Ta0@Y@	a1	1YT

Hi Carol – can I get some further analysis on the following.
Work order EM1104104:

1. **sample 001 (GW1) TPH silica gel clean up; and** (use original extract and raise LOR)
2. **sample 005 (GW35) TPH silica gel clean up.** (use original extract and raise LOR)

Work order EM11004161:

3. **sample 003 (GW8) TPH silica gel clean up and TPH speciation (Aliphatic/Aromatic);** (use 500mL amber bottle supplied even though holding time has expired)
4. **sample 006 (GW38) TPH silica gel clean up and TPH speciation (Aliphatic/Aromatic); and** (as above)
5. **sample 010 (GW37) TPH silica gel clean up and TPH speciation (Aliphatic/Aromatic).** (as above)

Cheers, Dave

Regards

How was your customer experience? Please send us your feedback

Carol Walsh
Senior Client Services Officer

ALS | Environmental (General Environmental Group)

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Melbourne
Work Order
SC EM1104608 SC

Telephone : +61-3-8549 9600

MO-349

From: David James [mailto:djames@environmentalearthsciences.com]
Sent: Wednesday, 4 May 2011 3:09 PM
To: Carol Walsh
Subject: RE: 210074 - Further analysis work order EM1104104 and EM1104161

Hi Carol – please go ahead with samples in EM1104104 of performing silica gel clean up from the original extract and raise LOR x 2.

And, EM1104161 –perform silica gel clean up **and TPH Speciation** from the 500mL bottle even though outside of holding time.

Thanks, Dave

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1104608**	Page	: 1 of 5
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GAS WORKS REBATCH OF EM1104104 AND EM1104161	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 04-MAY-2011
Sampler	: ----	Issue Date	: 13-MAY-2011
Order number	: ----		
		No. of samples received	: 5
Quote number	: ME/015/11 V3	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

g et%oMhland (g h) anMLaboratory Control : pide (LC:) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				g et%oMhland (g h) Report	Laboratory Control : pide (LC:) Report			
					: pide	: pide RecoSery (v)	RecoSery Limits (v)	
g et%oMWCompounM	CA: Number	LOR	Unit	Result	Concentration	LC:	LoH	Bik%
EP070: Total Petroleum Hydrocarbons - Speciation (QCLot: 1774523)								
EP070: Aliphatic C10-C14	----	50	µg/L	<50	5400 µg/L	110	53	123
EP070: Aliphatic C15-C28	----	100	µg/L	<100	17280 µg/L	72.5	59	130
EP070: Aliphatic C29-C36	----	50	µg/L	<50	----	----	----	----
EP070: Aromatic C10-C14	----	50	µg/L	<50	2310 µg/L	85.9	56	130
EP070: Aromatic C15-C28	----	100	µg/L	<100	3750 µg/L	104	70	130
EP070: Aromatic C29-C36	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 1774524)								
EP071-HXSG: C10 - C14 Fraction	----	50	µg/L	<50	8540 µg/L	103	70	130
EP071-HXSG: C15 - C28 Fraction	----	100	µg/L	<100	20300 µg/L	81.8	70	130
EP071-HXSG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071-HXSG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 1774552)								
EP071-HXSG: C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
EP071-HXSG: C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
EP071-HXSG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071-HXSG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----

g atrix : pide (g :) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) Results are required to be reported.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104608**	Page	: 1 of 5
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GAS WORKS REBATCH OF EM1104104 AND EM1104161	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 04-MAY-2011
Sampler	: ----	Issue Date	: 13-MAY-2011
Order number	: ----		
		No. of samples received	: 5
Quote number	: ME/015/11 V3	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP070: Total Petroleum Hydrocarbons - Speciation							
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	**19-APR-2011**	**05-MAY-2011**	26-APR-2011	×	**08-MAY-2011**	14-JUN-2011	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved GW1, GW35	**18-APR-2011**	**21-APR-2011**	25-APR-2011	✓	**06-MAY-2011**	14-JUN-2011	✓
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	**19-APR-2011**	**05-MAY-2011**	26-APR-2011	×	**08-MAY-2011**	14-JUN-2011	✓
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup							
Amber Glass Bottle - Unpreserved GW1, GW35	**18-APR-2011**	**21-APR-2011**	25-APR-2011	✓	**06-MAY-2011**	14-JUN-2011	✓
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	**19-APR-2011**	**05-MAY-2011**	26-APR-2011	×	**08-MAY-2011**	14-JUN-2011	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS)							
Total Petroleum Hydrocarbons after Silica Gel Clean Up	EP071-HXSG	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Speciation	EP070	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Petroleum Hydrocarbons after Silica Gel Clean Up	EP071-HXSG	2	5	**40.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Speciation	EP070	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
TPH - Speciation	EP070	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Petroleum Hydrocarbons after Silica Gel Clean Up	EP071-HXSG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID, following silica gel clean up, and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14-HX	WATER	Variation of USEPA SW 846 - 3510B: 500 mL to 0.5L of sample is transferred to a separatory funnel and serially extracted three times using 30mL DCM for each extract. The resultant extracts are combined, dehydrated, and exchanged into 5 mL of hexane for analysis. ALS default excludes sediment which may be resident in the container.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP070: Total Petroleum Hydrocarbons - Speciation						
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	05-MAY-2011	26-APR-2011	**9**	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup						
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	05-MAY-2011	26-APR-2011	**9**	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup						
Amber Glass Bottle - Unpreserved GW8, GW38, GW37	05-MAY-2011	26-APR-2011	**9**	----	----	----

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

CERTIFICATE OF ANALYSIS

Work Order	: **EM1104729**	eo:	f 13Lb3r
v PmDi	f **ENVIRONMENTAL EARTH SCIENCES**	t eyLGeiLGn	f EDumGLDc : DieP3RmmgmbD3M: PyLACD:
v LDieVl	f MI 3RJSWR3hJMEd	v LDieVl	f veGLP3 eRgO
JBBCgg	f X2X62T3aaY, s222UdvI Jp3SW73J- dUI JtW3,011	JBBCgg	f43 : gieP3 B3dj GDbouePf3SW3JAgiGePa3,1F1
E@enP	f Bzec : gw : : gmXymn	E@enP	f VeGLP6eRgOw eRg: DumGLXVLc
U: Pj CLD:	f 9r13r8F1rrr	U: Pj CLD:	f 9r1@@Y4I3r08
seVgmonP	f 9r130,3r8F1844	seVgmonP	f 9r1@@Y4I3r01
GLz Vl	f a100F43Jt5EI U3 JI K3GJd3 2I Kd3l E5JUvQ32s3 EM1104a8r	Nv3 : u: P	f (E M3lIII3dVO: BAP:35), qeDB3Jtd3Nvd,3C / AnGc : Di
2 GB: GDAc y: C	f @@@@		
v@@3DAc y: C	f @@@@	Rei: 3lec jP:g3 : V: mo: B	f 0r @MJp@011
dec jP:C	f @@@@	VggA: 3Rei:	f 1I @MJp@011
dmn	f @@@@		
		(LXLb3gec jP:g3C V: mo: B	f 1,
NALi: 3DAc y: C	f MEH01YK113S,	(LXLb3gec jP:g3eDeRg: B	f 1,

UOng3 Cj LG3 gAj : Gg: B: g3 eDn3 j CumbAg3 Cj LG)gq3 6 mO3 iOng3 Cb C DV: X3 I : gARg3 ej jP3 iL3 iO: 3 gec jP:)gq3 eg3 gAyc mi: BX3 JRP3 j eo: g3 Lb3 iOng3 Cj LG3 Oeu: 3 y: : D3 VO: VH B3 eDB3 ej j GLu: B3 bL(C:P:eg: X3

UOng3v : GmbWei: 3Lb3J DeRmgng3VLDienDg3O: 3tLRP.6 mDo3fDbLGc eimbDf

- G: D: GeP3v Lc c : Dig
- J DeRmbWeP3 : gARg
- dACGLoei: 3v LDiGLP3 mo mg

(JUJ 3JVVC Bmn B3 eyLGeiLGn3aY
3
UOng3BLVAc : Di3g3ggA: B3fD3
eVVLGBeDV: 36 mO3(JUJ 3
eVVC BmeimbD3C / AnGc : DigX

JVVC Bmn B3bLG3VLc j ReDV: 36 mO3
W2 kW7v 3lF0aYX

Signatories

UOng3 BLVAc : Di3 Oeg3 y: : D3 : P:VIGLDWeRP3 gmoD: B3 yn3 iO: 3 eAiGLGm: B3 gmoDeiLGng3 mDBmei: B3 y: P:.6 X3 EP:VIGLDW3 gmoDmDo3 Oeg3 y: : D VeGGmB3LAi3fD3VLc j ReDV: 36 mO3(GLV: BAC g3jj : VfbmB3fD3a13v sI 3 eG3l1X

Signatories	*Position*	*Accreditation Category*
(eDVn3 eDo	d: DmbG3d: c moLPeimP3WDgiGAc : Di3v O: c ngi	M: PyLACD: 32 GeDmg

General Comments

UO. 3 eDePmVeP3 j CLV: BAC g3 Ag: B3 yn3 iO. 3 EDumCLDc : DieP3 RmmgmD3 Oeu: 3 y: : D3 B: u: PLj : B3 bCLc 3 : gieyPgO. B3 mDi: CDeimDePP3 C VLoDm: B3 j CLV: BAC g3 gAVO3 eg3 iCLg: 3 j AyPgO. B3 yn3 iO. 3 - dE J 73 J QJ 73 Jd 3 eDB3 (E MX8 VW3 CLAg: B: u: PLj : B3 j CLV: BAC g3eC 3 c j PLn: B3bB3O. 3eyg: DV: 3LbBLVAc : Di: B3gieDBeCBg3LCgyn3VmDi3C / A: giX

. O. C 3c LmgiAC 3B: i: Cc mDeimD3Oeg3y: : D3 : CLCc : B73C gAPg3eC 3C j LC: B3LD3e3BCm36 : moCl3yegmgX

. O. C 3e3C j LC: B3Pgg3OeD3)<q3C gAP3g3OmO. C3OeD3O. 3 2 I 73Omg3c en3y: 3BA: 3L3 j Cm eCm3gec j P. 3 xiCeVlkBmo: giei: 3BmPimD3eDBkLC3bDgAbbmDi3gec j P. 3bLCaeDePmgmgX

. O. C 3O. 3 2 I 3Lb3e3C j LC: B3C gAP3BmbCg3bCc 3gieDBeCB3 2 I 73Omg3c en3y: 3BA: 3L3OmoC3c LmgiAC 3VLDi: Di73bDgAbbvmDi3gec j P. 3)C BAV: B36 : moCl3 c j PLn: BcqLCc eiCx3bDi: Cb C DV: X

. O. D3gec j PDo3mo : 3bDLCc eimD3gD3Li3 CLumB: B3yn3O. 3VmDi73gec j PDo3Bei: g3eC 3gCL6 D36 mCLAi3e3mo : 3VLc j LD: DiX8VD3O. g: 3bDgieDV: g73O. 3mo : 3VLc j LD: Di3Oeg3y: : D3eggAc : B3yn3O. 3eyLCeiLCn3LC3 CLV: ggmDo3 AC; Lg: gX

K: n3 v Jd3 (Ac y: C3=3v Jd3C omgiCn3DAc y: C3bCLc 3Beieyeg: 3c emDiemD: B3yn3v O. c mVeP3JygiCeVlg3d : CumV: gXUO. 3v O. c mVeP3JygiCeVlg3d : CumV: 3g3e3BmmgmD3LbBO. 3Jc : CmeD3v O. c mVeP3dLVminX
t 2 I 3=3 mo mBLbBC j LCmDo
^3=3UOmg3C gAP3g3VLc j Ai: B3bCLc 3bDBmmBAeP3eDePmi: 3B: i: VmDg3ei3LCeyLu: 3O. 3P. u: PLbBC j LCmDo

- **EP071-HXSG: Samples EM1104729-002,010 have LOR raised due to low sample volume.**

Analytical Results

dAy@leiCx: WATER			Client sample ID	GW3	GW4	GW10	GW11	GW15
			Client sampling date / time	a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104729-001**	**EM1104729-002**	**EM1104729-003**	**EM1104729-004**	**EM1104729-005**
EP070: Total Petroleum Hydrocarbons - Speciation								
Aromatic C10-C14	@@@@	Y0	%okt	<Y0	@@@@	<Y0	<Y0	<Y0
Aromatic C15-C28	@@@@	100	%okt	<100	@@@@	<100	<100	<100
Aromatic C29-C36	@@@@	Y0	%okt	<Y0	@@@@	<Y0	<Y0	<Y0
Aliphatic C10-C14	@@@@	Y0	%okt	<Y0	@@@@	<Y0	<Y0	<Y0
Aliphatic C15-C28	@@@@	100	%okt	<100	@@@@	<100	<100	<100
Aliphatic C29-C36	@@@@	Y0	%okt	<Y0	@@@@	<Y0	<Y0	<Y0
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	@@@@	Y0	%okt	**70**	<aY0	<Y0	<Y0	<Y0
C15 - C28 Fraction	@@@@	100	%okt	<100	<Y00	<100	<100	**140**
C29 - C36 Fraction	@@@@	Y0	%okt	<Y0	**350**	<Y0	<Y0	<Y0
^ C10 - C36 Fraction (sum)	@@@@	Y0	%okt	**70**	**350**	<Y0	<Y0	**140**
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	@@@@	100	%okt	**130**	<Y00	<100	<100	<100
>C16 - C34 Fraction	@@@@	100	%okt	<100	<Y00	<100	<100	**140**
>C34 - C40 Fraction	@@@@	100	%okt	<100	<Y00	<100	<100	<100
^ >C10 - C40 Fraction (sum)	@@@@	100	%okt	**130**	<Y00	<100	<100	**140**
EP070S:TPH Surrogates - Speciation								
2-Fluorobiphenyl	, a1@0@	0Xl	µ	**91.3**	@@@@	**100**	**102**	**99.7**
2-Bromonaphthalene	Y80@, @	0Xl	µ	**84.6**	@@@@	**95.1**	**102**	**83.7**

Analytical Results

dAy@leiCx: WATER

Compound	CAS Number	LOR	Unit	Client sample ID: GW24	GW25	GW27	GW39	GW42D
				Client sampling date / time: a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00	a1@ I @0113IYf00
				EM1104729-006	EM1104729-007	EM1104729-008	EM1104729-009	EM1104729-010
EP070: Total Petroleum Hydrocarbons - Speciation								
Aromatic C10-C14	@@@	Y0	%olt	12100	<Y0	<Y0	<Y0	@@@
Aromatic C15-C28	@@@	100	%olt	300	<100	<100	<100	@@@
Aromatic C29-C36	@@@	Y0	%olt	<Y0	<Y0	<Y0	<Y0	@@@
Aliphatic C10-C14	@@@	Y0	%olt	<Y0	<Y0	<Y0	<Y0	@@@
Aliphatic C15-C28	@@@	100	%olt	<100	<100	<100	<100	@@@
Aliphatic C29-C36	@@@	Y0	%olt	<Y0	<Y0	<Y0	<Y0	@@@
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	@@@	Y0	%olt	12300	<Y0	<Y0	170	<aY0
C15 - C28 Fraction	@@@	100	%olt	550	<100	<100	<100	<Y00
C29 - C36 Fraction	@@@	Y0	%olt	<Y0	<Y0	<Y0	<Y0	<aY0
^ C10 - C36 Fraction (sum)	@@@	Y0	%olt	12800	<Y0	<Y0	170	<aY0
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	@@@	100	%olt	10100	<100	<100	230	<Y00
>C16 - C34 Fraction	@@@	100	%olt	260	<100	<100	<100	<Y00
>C34 - C40 Fraction	@@@	100	%olt	<100	<100	<100	<100	<Y00
^ >C10 - C40 Fraction (sum)	@@@	100	%olt	10400	<100	<100	230	<Y00
EP070S:TPH Surrogates - Speciation								
2-Fluorobiphenyl	, a1@0@	0Xl	µ	102	93.2	96.9	96.3	@@@
2-Bromonaphthalene	Y80@, @	0Xl	µ	98.9	87.4	88.7	99.5	@@@

Analytical Results

dAy@leiQx: WATER			Client sample ID	GW43D	GW44D	GW19	@@@@	@@@@
			Client sampling date / time	a0@ I @0113IYf00	a0@ I @0113IYf00	a0@ I @0113IYf00	@@@@	@@@@
Compound	*CAS Number*	*LOR*	*Unit*	**EM1104729-011**	**EM1104729-012**	**EM1104729-013**	**----**	**----**
EP070: Total Petroleum Hydrocarbons - Speciation								
Aromatic C10-C14	@@@@	Y0	%olt	<Y0	**56500**	<Y0	@@@@	@@@@
Aromatic C15-C28	@@@@	100	%olt	<100	**800**	<100	@@@@	@@@@
Aromatic C29-C36	@@@@	Y0	%olt	<Y0	<Y0	<Y0	@@@@	@@@@
Aliphatic C10-C14	@@@@	Y0	%olt	<Y0	<Y0	<Y0	@@@@	@@@@
Aliphatic C15-C28	@@@@	100	%olt	<100	<100	<100	@@@@	@@@@
Aliphatic C29-C36	@@@@	Y0	%olt	<Y0	<Y0	<Y0	@@@@	@@@@
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	@@@@	Y0	%olt	<Y0	**56600**	<Y0	@@@@	@@@@
C15 - C28 Fraction	@@@@	100	%olt	<100	**1180**	<100	@@@@	@@@@
C29 - C36 Fraction	@@@@	Y0	%olt	<Y0	<Y0	<Y0	@@@@	@@@@
^ C10 - C36 Fraction (sum)	@@@@	Y0	%olt	<Y0	**57800**	<Y0	@@@@	@@@@
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
>C10 - C16 Fraction	@@@@	100	%olt	<100	**45300**	<100	@@@@	@@@@
>C16 - C34 Fraction	@@@@	100	%olt	<100	**500**	<100	@@@@	@@@@
>C34 - C40 Fraction	@@@@	100	%olt	<100	<100	<100	@@@@	@@@@
^ >C10 - C40 Fraction (sum)	@@@@	100	%olt	<100	**45800**	<100	@@@@	@@@@
EP070S:TPH Surrogates - Speciation								
2-Fluorobiphenyl	, a1@0@	0Xl	µ	**102**	**101**	**99.6**	@@@@	@@@@
2-Bromonaphthalene	Y80@, @	0Xl	µ	**89.6**	**102**	**84.5**	@@@@	@@@@

Surrogate Control Limits

dAy@MeiCx: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP070S:TPH Surrogates - Speciation			
2-Fluorobiphenyl	, a1@0@	Ya	144
2-Bromonaphthalene	Y80@, @	81	1, Y

Peter Ravlic

From: Carol Walsh
Sent: Friday, 6 May 2011 12:19 PM
To: Danielle White; Emily Sabatka; Megan Perrett; Peter Ravlic; Rosalinda Laria; Sarah Cordell
Cc: Herman Lin
Subject: FW: 210074 - Work order EM1104286 further analysis
Importance: High

Peter

Please rebatch samples from EM1104286 for TPH Silica gel and TPH speciation – see request below from David James.

Trays: MO311 & 315-8

There should be 500mL amber bottles supplied for these samples.

Client is aware holding times have expired.

Regards

How was your customer experience? Please send us your feedback

Carol Walsh
Senior Client Services Officer

ALS | Environmental (General Environmental Group)

Address
4 Westall Rd, Springvale, VIC, 3171
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FAX +61 3 8549 9601
www.alsglobal.com

Environmental Division
Melbourne
Work Order
EM1104729

Telephone : +61-3-8549 9600

From: David James [mailto:djames@environmentalearthsciences.com]
Sent: Friday, 6 May 2011 11:39 AM
To: Carol Walsh
Cc: Sylvia Tari
Subject: 210074 - Work order EM1104286 further analysis

Hi Carol – as per our conversation, can I get some further analysis on the following.

Work order EM1104286:

1 sample 001 (GW3) TPH silica gel clean up and TPH speciation (Aliphatic/Aromatic);
2 sample 002 (GW4) TPH silica gel clean up and TPH speciation;
3 sample 004 (GW10) TPH silica gel clean up and TPH speciation;
4 sample 005 (GW11) TPH silica gel clean up and TPH speciation;
5 sample 009 (GW15) TPH silica gel clean up and TPH speciation;
6 sample 014 (GW24) TPH silica gel clean up and TPH speciation;
7 sample 015 (GW25) TPH silica gel clean up and TPH speciation;
8 sample 016 (GW27) TPH silica gel clean up and TPH speciation;
9 sample 018 (GW39) TPH silica gel clean up and TPH speciation;

sampled: 20/4/11

MO-s 369 to 370

10 sample 021 (GW42) TPH silica gel clean up and TPH speciation;
11 sample 022 (GW43) TPH silica gel clean up and TPH speciation;
12 sample 023 (GW44) TPH silica gel clean up and TPH speciation;
13 sample 034 (GW19) TPH silica gel clean up and TPH speciation;

21/4/11
20/4/11

Thanks,

cid:image001.gif@01CB491F.D3B32C

David James – Environmental Engineer
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Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1104729**	Page	: 1 of 5
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 ALBERT PARK GAS WORKS REBATCH OF EM1104286	NC Level	: QEPM 1999 Schedule B(3) and ALS NCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2011
Sampler	: ----	Issue Date	: 19-MAY-2011
Order number	: ----		
		Qo. of samples received	: 13
Nuote number	: ME/015/11 V3	Qo. of samples analysed	: 13

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Nuality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA
WORLD RECOGNISED ACCREDITATION

QATA Accredited Laboratory 825

This document is issued in accordance with QATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Qancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and QEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the NC process lot
CAS Qumber = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed NC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method NWI-EQ/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- Qo Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

g et%oMhland (g h) anMLaboratory Control : pide (LC:) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this NC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this NC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				g et%oMhland (g h) Report	Laboratory Control : pide (LC:) Report			
					: pide	: pide RecoSery (v)	RecoSery Limits (v)	
g et%oMWCompounM	CA: Number	LOR	Unit	Result	Concentration	LC:	LoH	Bik%
EP070: Total Petroleum Hydrocarbons - Speciation (QCLot: 1779302)								
EP070: Aliphatic C10-C14	----	50	µg/L	<50	5400 µg/L	103	53	123
EP070: Aliphatic C15-C28	----	100	µg/L	<100	17280 µg/L	69.1	59	130
EP070: Aliphatic C29-C36	----	50	µg/L	<50	----	----	----	----
EP070: Aromatic C10-C14	----	50	µg/L	<50	2310 µg/L	79.5	56	130
EP070: Aromatic C15-C28	----	100	µg/L	<100	3750 µg/L	87.3	70	130
EP070: Aromatic C29-C36	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 1779303)								
EP071-HXSG: C10 - C14 Fraction	----	50	µg/L	<50	8540 µg/L	111	70	130
EP071-HXSG: C15 - C28 Fraction	----	100	µg/L	<100	20300 µg/L	81.0	70	130
EP071-HXSG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071-HXSG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----

g atrix : pide (g :) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this NC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Nuality Objectives (DNOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) Results are required to be reported.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1104729**	Page	: 1 of 5
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 223F YOOTSCRA, VICUA0 STRALIA F411	Address	: p Westall Rd S7ringvale VIC Australia F1- 1
Ejmail	: d@mesz eesi.biw	Ejmail	: carol.+alshz alsenviro.com
Tele7hone	: 651 958- 1555	Tele7hone	: 651jFj83p9 9548
Yacsimile	: 651 4F 958- 18pp	Yacsimile	: 651jFj83p9 9541
Pro@ct	: 2144- p ALBERT PARK GAS WORKS REBATCH OY EM114p285	QC Level	: NEPM 1999 Schedule B(F) and ALS QCSF requirement
Site	: jjjj		
CjOjC number	: jjjj	Date Sam7les Received	: 45jMA, j2411
Sam7ler	: jjjj	Issue Date	: 19jMA, j2411
Order number	: jjjj		
		No. of sam7les received	: 1F
Quote number	: ME/413/11 VF	No. of sam7les analysed	: 1F

This re7ort su7ersedes any 7revious re7ort(s) +ith this reference. Results a77ly to the sam7le(s) as submitted. All 7ages of this re7ort have been checked and a77roved for release.

This Inter7retive Quality Control Re7ort contains the follo+ing information:

- Analysis Holding Time Com7liance
- Quality Control Parameter Yrequency Com7liance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The follo+ing re7ort summarises extraction / 7re7aration and analysis times and com7ares +ith recommended holding times. Dates re7orted re7resent first date of extraction or analysis and 7recludes subsequent dilutions and reruns. Information is also 7rovided re the sam7le container (7reservative) from +hich the analysis aliquot +as taken. Ela7sed 7eriod to analysis re7resents number of days from sam7ling +here no extraction / digestion is involved or 7eriod from extraction / digestion +here this is 7resent. Yor com7osite sam7lesU sam7ling date is assumed to be that of the oldest sam7le contributing to the com7osite. Sam7le date for laboratory 7roduced leachates is assumed as the com7letion date of the leaching 7rocess. Outliers for holding time are based on 0 SEPA SW 8p5U APHAU AS and NEPM (1999). A listing of breaches is 7rovided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. Yor non jvolatile analytesU the holding time com7liance assessment com7ares the leach date +ith the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (1p days); Mercury (28 days) & other metals (184 days). A recorded breach therefore does not guarantee a breach for all nonj volatile 7arameters.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP070: Total Petroleum Hydrocarbons - Speciation								
Amber Glass Bottle - Unpreserved								
GW14U	GW2p	**20-APR-2011**	**21-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
Amber Glass Bottle - Unpreserved								
GWFU	GW11U	**20-APR-2011**	**27-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
GW13U	GW23U							
GW2- U	GWF9U							
GWpFDU	GWppDU							
GW19								
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
Amber Glass Bottle - Unpreserved								
GW14U	GW2p	**20-APR-2011**	**21-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
Amber Glass Bottle - Unpreserved								
GWp		**20-APR-2011**	**22-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
Amber Glass Bottle - Unpreserved								
GWFU	GW11U	**20-APR-2011**	**27-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
GW13U	GW23U							
GW2- U	GWF9U							
GWpFDU	GWppDU							
GW19								
Amber Glass Bottle - Unpreserved								
GWp2D		**21-APR-2011**	**22-APR-2011**	28j APRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup								
Amber Glass Bottle - Unpreserved								
GW14U	GW2p	**20-APR-2011**	**21-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
Amber Glass Bottle - Unpreserved								
GWp		**20-APR-2011**	**22-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
Amber Glass Bottle - Unpreserved								
GWFU	GW11U	**20-APR-2011**	**27-APR-2011**	2- jAPRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓
GW13U	GW23U							
GW2- U	GWF9U							
GWpFDU	GWppDU							
GW19								
Amber Glass Bottle - Unpreserved								
GWp2D		**21-APR-2011**	**22-APR-2011**	28j APRj2411	✓	**16-MAY-2011**	18j J0 Nj2411	✓

Quality Control Parameter Frequency Compliance

The follo+ing re7ort summarises the frequency of laboratory QC sam7les analysed +ithin the analytical lot(s) in +hich the submitted sam7le(s) +as(+here) 7rocessed. Actual rate should be greater than or equal to the ex7ected rate. A listing of breaches is 7rovided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not +ithin s7ecification ; ✓ = Quality Control frequency +ithin s7ecification.

Quality Control Sam7le Ty7e		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Sam7les (LCS)							
Total Petroleum Hydrocarbons after Silica Gel Clean 07	EP4- 1jHXSG	1	1F	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH j S7eciation	EP4- 4	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
Method Blanks (MB)							
Total Petroleum Hydrocarbons after Silica Gel Clean 07	EP4- 1jHXSG	1	1F	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement
TPH j S7eciation	EP4- 4	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(F) and ALS QCSF requirement

Brief Method Summaries

The analytical 7rocedures used by the Environmental Division have been develo7ed from established internationally recogniwed 7rocedures such as those 7ublished by the 0S EPAUAPHAUAS and NEPM. In house develo7ed 7rocedures are em7loyed in the absence of documented standards or by client request. The follo+ing re7ort 7rovides brief descri7tions of the analytical 7rocedures em7loyed for results re7orted in the Certificate of Analysis. Sources from +hich ALS methods have been develo7ed are 7rovided +ithin the Method Descri7tions.

Analytical Methods	Method	Matrix	Method Descriptions
TPH j S7eciation	EP4- 4	WATER	0SEPA SW 8p5 j 8413A The sam7le extract is analysed by Ca7illary GC/YID and quantification is by com7arison against an established 3 7oint calibration curve of njAlkane standards. This method is com7liant +ith NEPM (1999) Schedule B(F) (A77dx. 2)
Total Petroleum Hydrocarbons after Silica Gel Clean 07	EP4- 1jHXSG	WATER	(0SEPA SW 8p5 j 8413A) Sam7le extracts are analysed by Ca7illary GC/YIDUfollo+ing silica gel clean u7Uand quantified against alkane standards over the range C14 j CF5. This method is com7liant +ith NEPM (1999) Schedule B(F) (Method 345.1)

Preparation Methods	Method	Matrix	Method Descriptions
Se7aratory Yunnel Extraction of Liquids	ORG1pjHX	WATER	Variation of 0SEPA SW 8p5 j F314B: 344 mL to 4.3L of sam7le is transferred to a se7aratory funnel and serially extracted three times using F4mL DCM for each extract. The resultant extracts are combinedUdehydratedUand exchanged into 3 mL of hexane for analysis. ALS default excludes sediment +hich may be resident in the container.

Summary of Outliers

Outliers : Quality Control Samples

The follo+ing re7ort highlights outliers flagged in the Quality Control (QC) Re7ort. Surrogate recovery limits are static and based on 0SEPA SW8p5 or ALSjQWI/EN/F8 (in the absence of s7ecific 0SEPA limits). This re7ort dis7lays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This re7ort dis7lays Holding Time breaches only. Only the res7ective Extraction / Pre7aration and/or Analysis com7onent is/are dis7layed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The follo+ing re7ort highlights breaches in the Yrequency of Quality Control Sam7les.

- **No Quality Control Sample Frequency Outliers exist.**

ANALYTICAL REPORT

10 May 2011

Environmental Earth Sciences
Level 1
98 Maribyrnong St
FOOTSCRAY
VIC 3011

Attention: David James

Your Reference: 210074 Albert Park Gas Works
Report Number: ME106119

SAMPLE TYPE:	1 water
SAMPLES RECEIVED:	21/04/2011
PRELIMINARY REPORT EMAILED:	Not Issued

These samples were analysed in accordance with your written instructions.
A copy of the instructions is attached with the analytical report.

For and on behalf of:
SGS AUSTRALIA PTY LTD

Business Manager:	Sue Durukan	Sue.Durukan@sgs.com
Laboratory Manager:	Dr Aaron D. Stott	Aaron.Stott@sgs.com

This report has been authorised by the undersigned:

Dr Aaron Stott
Site Manager

Petrina Abbott
Client Services Officer

VOC's in water - National list Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			29/04/2011
Date Analysed			29/04/2011
Dichlorodifluoromethane (CFC-12)	5	µg/L	<5.0
Chloromethane	5	µg/L	<5.0
Vinyl chloride	5	µg/L	<5.0
Bromomethane	10	µg/L	<10
Trichlorofluoromethane*	10	µg/L	<10
Chloroethane	5	µg/L	<5.0
1,1-Dichloroethene	0.5	µg/L	<0.50
Carbon disulphide	0.5	µg/L	<0.50
1,1,2-Trichlorotrifluoroethane (CFC-113)	0.5	µg/L	<0.50
Iodomethane	2	µg/L	<2.0
Allyl chloride	0.5	µg/L	<0.50
Methylene chloride (DCM)	5	µg/L	<5.0
Acetone	10	µg/L	<10
trans-1,2-Dichloroethene	0.5	µg/L	<0.50
Methyl-tert-butyl ether	1	µg/L	<1.0
1,1-Dichloroethane	0.5	µg/L	<0.50
Acrylonitrile	2	µg/L	<2.0
Vinyl acetate	10	µg/L	<10
cis-1,2-Dichloroethene	0.5	µg/L	<0.50
1,2-Dichloroethane	0.5	µg/L	<0.50
2,2-Dichloropropane	0.5	µg/L	<0.50
Bromochloromethane	0.5	µg/L	<0.50
Chloroform	0.5	µg/L	<0.50
Carbon tetrachloride	0.5	µg/L	<0.50
1,1,1-Trichloroethane	0.5	µg/L	<0.50
1,1-Dichloropropene	0.5	µg/L	<0.50
2-Butanone (MEK)	10	µg/L	<10
Benzene	0.5	µg/L	<0.5
Trichloroethene	0.5	µg/L	<0.50
Dibromomethane	0.5	µg/L	<0.50
1,2-Dichloropropane	0.5	µg/L	<0.50
Bromodichloromethane	0.5	µg/L	<0.50

VOC's in water - National list Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
cis-1,3-Dichloropropene	0.5	µg/L	<0.50
Toluene	0.5	µg/L	<0.5
Tetrachloroethene	0.5	µg/L	2.1
trans-1,3-Dichloropropene	0.5	µg/L	<0.50
4-Methyl-2-pentanone (MIBK)	5	µg/L	<5.0
1,1,2-Trichloroethane	0.5	µg/L	<0.50
Dibromochloromethane	0.5	µg/L	<0.50
1,3-Dichloropropane	0.5	µg/L	<0.50
1,2-Dibromoethane (EDB)	0.5	µg/L	<0.50
2-Hexanone (MBK)	5	µg/L	<5.0
Chlorobenzene	0.5	µg/L	<0.50
Ethylbenzene	0.5	µg/L	<0.5
1,1,1,2-Tetrachloroethane	0.5	µg/L	<0.50
meta- & para-Xylene	1	µg/L	<1
ortho-Xylene	0.5	µg/L	<0.5
Styrene	0.5	µg/L	<0.50
Bromoform	0.5	µg/L	<0.50
Isopropylbenzene	0.5	µg/L	<0.50
cis-1,4-Dichloro-2-butene	0.5	µg/L	<0.50
Bromobenzene	0.5	µg/L	<0.50
Propylbenzene	0.5	µg/L	<0.50
1,1,2,2-Tetrachloroethane	0.5	µg/L	<0.50
2-Chlorotoluene	0.5	µg/L	<0.50
1,3,5-Trimethylbenzene	0.5	µg/L	<0.50
1,2,3-trichloropropane	0.5	µg/L	<0.50
trans-1,4-Dichloro-2-butene	0.5	µg/L	<0.50
4-Chlorotoluene	0.5	µg/L	<0.50
tert-Butylbenzene	0.5	µg/L	<0.50
1,2,4-Trimethylbenzene	0.5	µg/L	<0.50
sec-Butylbenzene	0.5	µg/L	<0.50
4-Isopropyltoluene	0.5	µg/L	<0.50
1,3-Dichlorobenzene	0.5	µg/L	<0.50
1,4-Dichlorobenzene	0.5	µg/L	<0.50
n-Butylbenzene	0.5	µg/L	<0.50
1,2-Dichlorobenzene	0.5	µg/L	<0.50
1,2-Dibromo-3-chloropropane (DBCP)	0.5	µg/L	<0.50

VOC's in water - National list Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Hexachlorobutadiene	1	µg/L	<1.0
1,2,4-Trichlorobenzene	0.5	µg/L	<0.50
Naphthalene	0.5	µg/L	<0.50
1,2,3-Trichlorobenzene	0.5	µg/L	<0.50
Dibromofluoromethane (Surrogate)	0	% Recovery	113
1,2-Dichloroethane-d4 (Surrogate)	0	% recovery	110
Toluene-*d8 (Surrogate)*	0	% recovery	111
4-Bromofluorobenzene (Surrogate)	0	% recovery	96

AN403 - TRH C_6 - C_9 Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted (C_6 - C_9)			29/04/2011
Date Analysed (C_6 - C_9)			29/04/2011
TRH C_6 - C_9	20	µg/L	<20

AN403 - TRH C_{10} - C_{36} Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted (C_{10} - C_{36})			28/04/2011
Date Analysed (C_{10} - C_{36})			28/04/2011
TRH C_{10} - C_{14}	50	µg/L	<50
TRH C_{15} - C_{28}	100	µg/L	260
TRH C_{29} - C_{36}	50	µg/L	<50

AN420 - PAHs in waters Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			27/04/2011
Date Analysed			28/04/2011
Naphthalene	0.2	µg/L	<0.20
Acenaphthylene	0.2	µg/L	<0.20
Acenaphthene	0.2	µg/L	<0.20
Fluorene	0.2	µg/L	<0.20
Phenanthrene	0.2	µg/L	<0.20
Anthracene	0.2	µg/L	<0.20
Fluoranthene	0.2	µg/L	<0.20
Pyrene	0.2	µg/L	<0.20
Benz(a)anthracene	0.2	µg/L	<0.20
Chrysene	0.2	µg/L	<0.20
Benzo(b)fluoranthene	0.2	µg/L	<0.20
Benzo(k)fluoranthene	0.2	µg/L	<0.20
Benzo(a)pyrene	0.2	µg/L	<0.20
Indeno(1,2,3-cd)pyrene	0.2	µg/L	<0.20
Dibenz(a,h)anthracene	0.2	µg/L	<0.20
Benzo(g,h,i)perylene	0.2	µg/L	<0.2
Total PAHs	2	µg/L	<2.00
2-Fluorobiphenyl (Surrogate)	0.1	% Recovery	63
Anthracene-d10 (Surrogate)	0.1	% Recovery	74
4-Terphenyl-d14 (Surrogate)	0.1	% Recovery	76

Inorganics Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			29/04/2011
Date Analysed			29/04/2011
Total Dissolved Solids	10	mg/L	920
Sulphide	0.1	mg/L	0.5
O-PO4 as P, Filtered	0.005	mg/L	<0.005

Hexavalent Chromium in Water			
Our Reference:	LOR	UNITS	ME106119-1
Your Reference	---------	---------	Split 2
Date Sampled	---------	---------	19/04/2011
Sample Type			Water
Container Type			1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			29/03/2011
Date Analysed			29/03/2011
Hexavalent Chromium, Cr^{6+}	0.005	mg/L	<0.005

Cyanide in Water Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			2/05/2011
Date Analysed			2/05/2011
Total Cyanide	0.005	mg/L	0.029
Free Cyanide	0.004	mg/L	0.016
Cyanide (WAD)	0.004	mg/L	0.009

Cations / Anions Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted			28/04/2011
Date Analysed			28/04/2011
pH		pH units	7.8
Alkalinity Bicarb $CaCO_3$	2	mg/L	390
Alkalinity Carbonate $CaCO_3$	2	mg/L	<2
Total Alkalinity as $CaCO_3$	2	mg/L	390
Sulphate as SO_4	2	mg/L	200
Chloride	2	mg/L	300
Nitrate as N	0.010	mg/L	<0.010
Nitrite as N	0.003	mg/L	0.005
Fluoride	0.1	mg/L	1.1
Calcium	0.1	mg/L	32
Magnesium	0.1	mg/L	24
Sodium	0.1	mg/L	240
Potassium	0.2	mg/L	6.8

Trace HM (ICP-MS)-Dissolved Our Reference: Your Reference Date Sampled Sample Type Container Type	LOR --------- ---------	UNITS --------- ---------	ME106119-1 Split 2 19/04/2011 Water 1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted (Metals-ICPMS)			29/04/2011
Date Analysed (Metals-ICPMS)			29/04/2011
Aluminium	1	µg/L	41
Arsenic	1	µg/L	190
Cadmium	0.1	µg/L	<0.1
Copper	1	µg/L	<1
Iron	5	µg/L	590
Lead	1	µg/L	<1
Nickel	1	µg/L	9
Zinc	1	µg/L	3
Cobalt	1	µg/L	<1
Selenium	2	µg/L	<2
Boron	1	µg/L	700
Manganese	1	µg/L	190

Mercury Cold Vapor/Hg Analyser			
Our Reference:	LOR	UNITS	ME106119-1
Your Reference	---------	---------	Split 2
Date Sampled	---------	---------	19/04/2011
Sample Type			Water
Container Type			1 Lt p, 500ml A,4p, 125ml a, 2 vials
Date Extracted (Mercury)			29/04/2011
Date Analysed (Mercury)			29/04/2011
Mercury (Dissolved)	0.0005	mg/L	<0.0005

Method ID	Methodology Summary
AN434	The analysis of VOC compounds in soils, sediments, sludges and waters by gas chromatography with mass spectrometric (GCMS) detection based on USEPA SW-846 method 8260B.
AN403	The analysis of C_6 - C_9 TRH compounds in soils, sediments, sludges and waters by gas chromatography with mass spectrometric (GC/MS) detection based on USEPA SW-846 method 8260B. The analysis of C_{10} - C_{40} TRH compounds in soils, sediments, sludges and waters by gas chromatography with flame ionisation (GC/FID) detection based on USEPA SW-846 method 8015C.
AN420	The analysis of SVOC including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols by GC/MS based on USEPA Method 8270C.
AN113	Determination of total solids (TS), total dissolved solids (TDS) and volatile solids (VS) by gravimetic analysis, based on APHA Methods 2540B, 2540C, 2540E & 2540G.
AN149	Sulphide - determined titrimetrically using an iodometric titration following a zinc acetate treatment to overcome interferences. Based on APHA 20th ED, 4500-S2-F.
AN278	
AN201	Hexavalent Chromium (Cr^{6+}) - water sample is filtered and determined by colourimetric technique. Soil sample is extracted by hot alkali leach, the resulting leachate is then neutralised and analysed by colourimetric technique, based on USEPA 3060A.
AN154	Cyanide is analysed by discrete analyser. Reference APHA 4500-CN-C/E.
AN101	pH - Measured using pH meter and electrode in accordance with APHA 20th ED, 4500-H+.
AN135	The determination of Total, Bicarbonate, Carbonate & Hydroxide Alkalinity in potable & ground waterr, sewage, trade waste & saline water, in accordance with APHA 21th ED, Section 4500-H+ B & Section 2320 B.
AN245	Determination of Chloride, Sulphate, Nitrate & Nitrite by Ion Chromatography, based on APHA method 4110C & 4110Cl A
AN277	Nitrite as N- determined by colourimetric technique using discrete analyser. Based in APHA 21st Edition, 4500-Norg D/USEPA 351.2.
ANA-014	Fluoride - Determined potentiometrically by ion-selective electrode.
AN320	Determination of elements by ICP-OES following appropriate sample preparation & digestion.
AN318	Determination of elements at trace levels in waters by ICP-MS. Method based on USEPA 6020A
SEM-005	Determination of Mercury by Cold Vapour AAS following appropriate sample preparation & digestion. Based on APHA 21st Edition, 3112B.

QUALITY CONTROL VOC's in water - National list	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Date Analysed				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Dichlorodifluoromethane (CFC-12)	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	105%
Chloromethane	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	123%
Vinyl chloride	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	100%
Bromomethane	µg/L	10	AN434	<10	[NT]	[NT]	LCS	107%
Trichlorofluoromethane*	µg/L	10	AN434	<10	[NT]	[NT]	LCS	132%
Chloroethane	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	127%
1,1-Dichloroethene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	107%
Carbon disulphide	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	121%
1,1,2-Trichlorotrifluoroethane (CFC-113)	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	117%
Iodomethane	µg/L	2	AN434	<2.0	[NT]	[NT]	LCS	61%
Allyl chloride	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	118%
Methylene chloride (DCM)	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	115%
Acetone	µg/L	10	AN434	<10	[NT]	[NT]	LCS	108%
trans-1,2-Dichloroethene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	124%
Methyl-tert-butyl ether	µg/L	1	AN434	<1.0	[NT]	[NT]	LCS	106%
1,1-Dichloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	115%
Acrylonitrile	µg/L	2	AN434	<2.0	[NT]	[NT]	LCS	127%
Vinyl acetate	µg/L	10	AN434	<10	[NT]	[NT]	LCS	117%
cis-1,2-Dichloroethene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	102%
1,2-Dichloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	105%
2,2-Dichloropropane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	115%
Bromochloromethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	104%
Chloroform	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	118%
Carbon tetrachloride	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	120%
1,1,1-Trichloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	118%
1,1-Dichloropropene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	117%
2-Butanone (MEK)	µg/L	10	AN434	<10	[NT]	[NT]	LCS	101%
Benzene	µg/L	0.5	AN434	<0.5	[NT]	[NT]	LCS	107%
Trichloroethene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	107%
Dibromomethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	100%
1,2-Dichloropropane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	104%
Bromodichloromethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	93%
cis-1,3-Dichloropropene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	84%
Toluene	µg/L	0.5	AN434	<0.5	[NT]	[NT]	LCS	108%
Tetrachloroethene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	102%

QUALITY CONTROL VOC's in water - National list	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
trans-1,3-Dichloropropene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	91%
4-Methyl-2-pentanone (MIBK)	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	96%
1,1,2-Trichloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	104%
Dibromochloromethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	85%
1,3-Dichloropropane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	99%
1,2-Dibromoethane (EDB)	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	93%
2-Hexanone (MBK)	µg/L	5	AN434	<5.0	[NT]	[NT]	LCS	91%
Chlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	112%
Ethylbenzene	µg/L	0.5	AN434	<0.5	[NT]	[NT]	LCS	112%
1,1,1,2-Tetrachloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	98%
meta- & para-Xylene	µg/L	1	AN434	<1	[NT]	[NT]	LCS	110%
ortho-Xylene	µg/L	0.5	AN434	<0.5	[NT]	[NT]	LCS	97%
Styrene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	100%
Bromoform	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	117%
Isopropylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	108%
cis-1,4-Dichloro-2-butene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	78%
Bromobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	104%
Propylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	117%
1,1,2,2-Tetrachloroethane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	112%
2-Chlorotoluene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	105%
1,3,5-Trimethylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	109%
1,2,3-trichloropropane	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	107%
trans-1,4-Dichloro-2-butene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	93%
4-Chlorotoluene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	106%
tert-Butylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	109%
1,2,4-Trimethylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	107%
sec-Butylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	117%
4-Isopropyltoluene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	107%
1,3-Dichlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	109%
1,4-Dichlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	108%
n-Butylbenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	116%
1,2-Dichlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	104%
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	85%
Hexachlorobutadiene	µg/L	1	AN434	<1.0	[NT]	[NT]	LCS	115%
1,2,4-Trichlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	87%

QUALITY CONTROL VOC's in water - National list	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Naphthalene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	76%
1,2,3-Trichlorobenzene	µg/L	0.5	AN434	<0.50	[NT]	[NT]	LCS	91%
Dibromofluoromethane (Surrogate)	% Recovery	0	AN434	115	[NT]	[NT]	LCS	105%
1,2-Dichloroethane-d4 (Surrogate)	% recovery	0	AN434	113	[NT]	[NT]	LCS	108%
Toluene-*d8 (Surrogate)*	% recovery	0	AN434	119	[NT]	[NT]	LCS	113%
4-Bromofluorobenzene (Surrogate)	% recovery	0	AN434	110	[NT]	[NT]	LCS	110%

QUALITY CONTROL AN403 - TRH C_6 - C_9	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted (C_6 - C_9)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Date Analysed (C_6 - C_9)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
TRH C_6 - C_9	µg/L	20	AN403	<20	[NT]	[NT]	LCS	97%

QUALITY CONTROL AN403 - TRH C_{10} - C_{36}	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted (C_{10} - C_{36})				28/04/2011	[NT]	[NT]	LCS	28/04/2011
Date Analysed (C_{10} - C_{36})				28/04/2011	[NT]	[NT]	LCS	28/04/2011
TRH C_{10} - C_{14}	µg/L	50	AN403	<50	[NT]	[NT]	LCS	82%
TRH C_{15} - C_{28}	µg/L	100	AN403	<100	[NT]	[NT]	LCS	87%
TRH C_{29} - C_{36}	µg/L	50	AN403	<50	[NT]	[NT]	LCS	82%

QUALITY CONTROL AN420 - PAHs in waters	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				27/04/2011	[NT]	[NT]	LCS	27/04/2011
Date Analysed				28/04/2011	[NT]	[NT]	LCS	28/04/2011
Naphthalene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	82%
Acenaphthylene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	81%
Acenaphthene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	81%
Fluorene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	81%
Phenanthrene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	81%
Anthracene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	82%
Fluoranthene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	82%
Pyrene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	82%
Benz(a)anthracene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	80%
Chrysene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	110%
Benzo(b)fluoranthene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	84%
Benzo(k)fluoranthene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	88%
Benzo(a)pyrene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	85%
Indeno(1,2,3-cd)pyrene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	107%
Dibenz(a,h)anthracene	µg/L	0.2	AN420	<0.20	[NT]	[NT]	LCS	110%
Benzo(g,h,i)perylene	µg/L	0.2	AN420	<0.2	[NT]	[NT]	LCS	109%
Total PAHs	µg/L	2	AN420	<2.00	[NT]	[NT]	[NR]	[NR]
2-Fluorobiphenyl (Surrogate)	% Recovery	0.1	AN420	62	[NT]	[NT]	LCS	76%
Anthracene-d10 (Surrogate)	% Recovery	0.1	AN420	69	[NT]	[NT]	LCS	80%
4-Terphenyl-d14 (Surrogate)	% Recovery	0.1	AN420	75	[NT]	[NT]	LCS	81%

QUALITY CONTROL Inorganics	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				29/4/2011	[NT]	[NT]	LCS	29/4/2011
Date Analysed				29/4/2011	[NT]	[NT]	LCS	29/4/2011
Total Dissolved Solids	mg/L	10	AN113	<10	[NT]	[NT]	LCS	110%
Sulphide	mg/L	0.1	AN149	<0.5	[NT]	[NT]	LCS	90%
O-PO4 as P, Filtered	mg/L	0.005	AN278	<0.005	[NT]	[NT]	LCS	89%

QUALITY CONTROL Hexavalent Chromium in Water	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Date Analysed				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Hexavalent Chromium, Cr^{6+}	mg/L	0.005	AN201	<0.005	[NT]	[NT]	LCS	97%

QUALITY CONTROL Cyanide in Water	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				02/05/2011	[NT]	[NT]	LCS	02/05/2011
Date Analysed				02/05/2011	[NT]	[NT]	LCS	02/05/2011
Total Cyanide	mg/L	0.005		<0.005	[NT]	[NT]	LCS	88%
Free Cyanide	mg/L	0.004	AN154	<0.004	[NT]	[NT]	LCS	88%
Cyanide (WAD)	mg/L	0.004	AN154	<0.004	[NT]	[NT]	LCS	88%

QUALITY CONTROL Cations / Anions	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted				28/04/2011	[NT]	[NT]	LCS	22/4/11
Date Analysed				28/04/2011	[NT]	[NT]	LCS	22/4/11
pH	pH units		AN101	[NT]	[NT]	[NT]	[NR]	[NR]
Alkalinity Bicarb $CaCO_3$	mg/L	2	AN135	<2	[NT]	[NT]	LCS	93%
Alkalinity Carbonate $CaCO_3$	mg/L	2	AN135	<2	[NT]	[NT]	LCS	93%
Total Alkalinity as $CaCO_3$	mg/L	2	AN135	<2	[NT]	[NT]	LCS	93%
Sulphate as SO_4	mg/L	2	AN245	<2	[NT]	[NT]	LCS	100%
Chloride	mg/L	2	AN245	<2	[NT]	[NT]	LCS	101%

QUALITY CONTROL Cations / Anions	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Nitrate as N	mg/L	0.010	AN245	<0.010	[NT]	[NT]	LCS	88%
Nitrite as N	mg/L	0.003	AN277	<0.003	[NT]	[NT]	LCS	92%
Fluoride	mg/L	0.1	ANA-014	<0.1	[NT]	[NT]	LCS	103%
Calcium	mg/L	0.1	AN320	<0.1	[NT]	[NT]	LCS	102%
Magnesium	mg/L	0.1	AN320	<0.1	[NT]	[NT]	LCS	100%
Sodium	mg/L	0.1	AN320	<0.1	[NT]	[NT]	LCS	110%
Potassium	mg/L	0.2	AN320	<0.2	[NT]	[NT]	LCS	107%

QUALITY CONTROL Trace HM (ICP-MS)-Dissolved	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted (Metals-ICPMS)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Date Analysed (Metals-ICPMS)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Aluminium	µg/L	1	AN318	<1	[NT]	[NT]	LCS	101%
Arsenic	µg/L	1	AN318	<1	[NT]	[NT]	LCS	100%
Cadmium	µg/L	0.1	AN318	<0.1	[NT]	[NT]	LCS	106%
Copper	µg/L	1	AN318	<1	[NT]	[NT]	LCS	100%
Iron	µg/L	5	AN318	<5	[NT]	[NT]	LCS	105%
Lead	µg/L	1	AN318	<1	[NT]	[NT]	LCS	108%
Nickel	µg/L	1	AN318	<1	[NT]	[NT]	LCS	103%
Zinc	µg/L	1	AN318	<1	[NT]	[NT]	LCS	97%
Cobalt	µg/L	1	AN318	<1	[NT]	[NT]	LCS	103%
Selenium	µg/L	2	AN318	<2	[NT]	[NT]	LCS	99%
Boron	µg/L	1	AN318	<1	[NT]	[NT]	LCS	104%
Manganese	µg/L	1	AN318	<1	[NT]	[NT]	LCS	105%

QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate %RPD	Spike Sm#	Matrix Spike % Recovery %RPD
Date Extracted (Mercury)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Date Analysed (Mercury)				29/04/2011	[NT]	[NT]	LCS	29/04/2011
Mercury (Dissolved)	mg/L	0.0005	SEM-005	<0.0005	[NT]	[NT]	LCS	104%

Result Codes

[INS]	:	Insufficient Sample for this test	[RPD]	:	Relative Percentage Difference
[NR]	:	Not Requested	*	:	Not part of NATA Accreditation
[NT]	:	Not tested	[N/A]	:	Not Applicable

Report Comments

Hexavalent Cr, Cyanide and metals were all analysed in SGS Sydney, report no: SE87258
NATA Corporate Accreditation No. 2562, Site No 2076

Note: Test results are not corrected for recovery (excluding Dioxins/Furans* and PAH in XAD and PUF).

Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.
Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.
Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.
Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.
Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

Unless otherwise specified in the test method, the following general acceptance criteria apply:

Method Blanks:	<LOR
Duplicates:	<5 x LOR: No RPD criteria applied.
	>5 x LOR: 0-30% RPD is accepted.
LCS's:	Determined by Control Charts.
	Where control charts have not been developed, the Matrix Spikes criteria apply.
Matrix Spikes:	70-130% recovery is accepted for metals / inorganics.
	60-140% is accepted for organics.
Surrogates:	60-130% recovery is accepted for BTEX.
	70-130% recovery is accepted for other organics.

NATA
WORLD RECOGNISED ACCREDITATION

APPENDIX D QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

TABLE OF CONTENTS

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

The aim of a quality control and quality assurance (QA/QC) is to deliver data that is:

- representative of what is sampled;
- precise;
- accurate; and
- reproducible.

As investigations involve both field and laboratory QA/QC, these are similarly divided. The objective of this document is to evaluate and identify the data quality objectives (DQOs) and the data quality indicators (DQIs), which are used to assess whether the DQOs have been met.

All surface water, groundwater and soil sampling procedures to be followed are described in full in the *Soil, gas and groundwater sampling manual (*Environmental Earth Sciences Pty Ltd 2009). This document should be referred to for field procedures, sampling and conveyance. Copies are available for inspection if required.

The Victorian guideline documents used in the evaluation of the data set for this investigation are:

Australian and New Zealand Environment and Conservation Council 1992, *Australian and New Zealand Guidelines for the assessment and management of contaminated sites,* Australia and New Zealand Environment Council, National Health and Medical Research Council, Melbourne, VIC;

EPA Victoria 2009, Industrial Waste Resource Guidelines (IWRG) *Publication IWRG701, sampling and analysis of waters, wastewaters, soils and wastes*;

EPA Victoria 2000, *Publication 669, Groundwater sampling guidelines*, EPA VIC, Southbank, VIC;

National Environment Protection Council (NEPC) 1999, *National environment protection (assessment of site contamination) measure*, National Environment Protection Council, Adelaide, SA;

Standards Australia 2005, *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, (AS 4482.1), Standards Australia, Homebush, NSW; and

Standards Australia 1999, *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances*, (AS 4482.2), Standards Australia, Homebush, NSW.

Data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. These are referred to as the PARCC parameters. The PARCC (and additional QA) parameters are discussed within this report.

The following items form part of the QA/QC appendix:

- repeatability;
- precision;
- accuracy;
- representativeness;
- completeness;
- comparability;
- sensitivity;
- holding times;
- blanks; and
- procedures for anomalous samples and confirmation checking.

1.2 Background

The terms “quality assurance” and “quality control” are often confused. In any program, quality control is required before assurance can be put in place. With respect to laboratory analysis activities, these terms are defined as follows:

Quality Assurance: “All the planned and systematic activities implemented within the quality system and demonstrated as needed to provide adequate confidence that an entity will fulfil requirements for quality”. (ISO 8402-1995)

This encompasses all actions, procedures, checks and decisions undertaken to ensure the accuracy and reliability of analysis results. It includes routine procedures which ensure proper sample control, data transfer, instrument calibration, the decisions required to select and properly train staff, select equipment and analytical methods, and the day to day judgements resulting from regular scrutiny and maintenance of the laboratory system.

Quality Control: “The operational techniques and activities that are used to fulfil the requirements for quality”. (ISO 8402-1995)

These are the components of QA which serve to monitor and measure the effectiveness of other QA procedures by comparison with previously decided objectives. They include measurement of the quality of reagents, cleanliness of apparatus, accuracy and precision of methods and instrumentation, and reliability of all of these factors as implemented in a given laboratory from day to day.

A complete discussion of either of these terms or the steps for implementing them is beyond the scope of this document. It is widely recognised, however, that adoption of sound laboratory QA and QC procedures is essential and readers are referred to documentation available from the National Association of Testing Authorities (NATA), if further information is required.

2 DATA QUALITY OBJECTIVES

Development of data quality objectives (DQOs) for each project is a requirement of the NEPC 1999. This is based on a DQO process formulated by the USEPA for contaminated land assessment and remediation. This has not been formally adopted by the EPA Victoria, or the contaminated land industry, however, it provides sound guidance for a consistent approach in understanding site assessment and remediation. Many environmental practitioners are now following this process.

The DQO process is defined by seven steps. Each of these steps has been given due consideration in the undertaking of this project. In brief, these steps are:

Step 1: State the problem and establish the DQO team.

Step 2: Determine the possible and probable actions that will resolve the problems.

Step 3: Identify the informational inputs to assist in the problem resolution.

Step 4: Define the boundaries of the study (geographical, temporal, etc).

Step 5: Develop and define decision rules.

Step 6: Specify tolerable limits to reduce probability of incorrect decisions.

Step 7: Ensure the quality of the information obtained.

Step 1 — State the problem
The problem is that the site has been used for industrial land-use and the potential exists for soil and groundwater contamination to have occurred during this time. The objectives of this groundwater investigation were to gain a further understanding of hydrogeological and hydro geochemical data related to the site. The data and observations noted during this groundwater investigation will assist to address the higher risk issues identified at the site.

Step 2 — Identify the decision
These works have been commissioned to to address the higher risk issues identified at the site. A decision is required on what management action is necessary (if any) to ensure the site becomes or remains suitable for its intended use. If the site is deemed not to be suitable for its intended use, direction will be given to determine what is considered by Environmental Earth Sciences VIC to be the most suitable path for making the site suitable.

Step 3 — Identify the inputs to the decision
The study inputs included a, review of environmental investigations undertaken at the site, data from groundwater investigation undertaken at the site, and reference to published criteria to assist the decision-making process.

Step 4 — Define the study boundaries
The physical boundary of the study area is defined in Section 3 of the report and Figure 2 and 3.

Step 5 — Develop and define decision rules
All analytical data will be compared and evaluated against appropriate published criteria. The State Environment Protection Policy *Groundwaters of Victoria (*SEPP (1997) *GoV)* provides the framework for the protection of groundwater and associated beneficial uses throughout Victoria. The policy allows for a consistent approach to the prevention of contamination of groundwater and clean-up of pollution of groundwater throughout Victoria and sets environmental quality indicators and objectives for each beneficial use.

The SEPP (1997) GoV defines certain aquifer categories based on salinity reported as total dissolved salts (TDS) and associated beneficial uses to be protected. In addition, where the SEPP GoV does not specify contaminant limits, the ANZECC/ ARMCANZ (2000) *Australian and New Zealand guidelines for fresh and marine water quality* and NEPM (1999) *Groundwater investigation levels* (GILs) are consulted. In Victoria, the NEPM levels are generally used in preference to ANZECC/ ARMCANZ criteria for all beneficial uses other than ecological receptors. The NEPM HIL's presented within Schedule B(1) Table 5-B are essentially based on the ANZECC 1992 *Australian water quality guidelines for fresh and marine waters*.

Step 6 — Specify tolerable limits on decision errors
Acceptable limits for field data analysis (relative percent differences for primary and duplicate results) are between 50 and 150 percent (depending on the origin of the sample and volatility of the chemicals present). These are summarised in Table 2 as the measurement data quality indicators (MDQIs), which will be used to establish whether the DQOs have been met.

Acceptable limits for field data analysis (relative percent differences for primary and duplicate results) are between 50 and 150 percent (depending on the origin of the sample and volatility of the chemicals present). Acceptable limits for laboratory duplicate analysis may be affected by the volatility of the chemicals present and will be set based on site specific information such as background concentrations. These are summarised in Table 2 as the measurement data quality indicators (MDQIs), which will be used to establish whether the DQOs have been met.

Most of the procedures in the NEPM (1999) have risk probabilities associated with allowable error margins incorporated into them. It is therefore proposed that no further "tolerable limits" be investigated at this stage of the project.

Step 7 — Optimise the design
The sample design is based on assessment of possible migration of contaminants of concern (CoC) from the site. Environmental Earth Sciences VIC believes that the sampling design is optimal considering temporal limitations and access constraints. The density of the sampling locations and the quality of the data set are suitable for determination of the suitability of the site for its proposed current and future use.

TABLE 1 MEASUREMENT DATA QUALITY INDICATORS (MDQIS)

Parameter	Procedure	Minimum Frequency	Criteria	
			(5 to 10x LOR[4])	>10x LOR
Precision	Field Duplicates	1 in 20 - metals	<150 RPD	<50 RPD
		1 in 20 - semi-volatiles	<100 RPD	<80 RPD
		1 in 20 - volatiles	<150 RPD	<130 RPD
	Lab Replicate*	1 in 20	<50 RPD	<30 RPD
Accuracy*	Reference Material	1 in 10	60% to 140%R	80% to 120%R
	Matrix spikes			
	Surrogate spikes			
Representativeness*	Reagent Blanks	1 per batch	No detection	
	Holding Times*	Every sample	-	
Blanks**	Trip Blank	1 per batch	No detection	
	Rinsate Blanks			
Sensitivity	Limit of Reporting	Every sample	LOR < ½ site criteria	

Note(s):
1. RPD – relative percentage difference
2. %R – percent recovery
3. LOR – limit of reporting
4. [4] no limit at <5x LOR
5. * the MDQI is usually specified in the standard method. If not, use the default values set out in this table
6. ** only necessary when measuring dissolved metals and volatile organic compounds in water samples

3 QUALITY CONTROL AND QUALITY ASSURANCE

3.1 Measurement data quality objectives

Step 7 of the DQO process (Section 2.0) is a focus on the quality of the information by measurement, that is, measurement data quality objectives (MDQOs). The aim of QA/QC is to deliver data that is representative of what is sampled, precise, accurate and reproducible. As investigations involve both field and laboratory QA/QC, these are similarly divided. The objective of this section is to provide the MDQOs and the measurement data quality indicators (MDQIs), which will be used to establish whether the DQOs have been met.

All groundwater and soil sampling procedures need to be undertaken according to a standard procedure, for example those procedures set out in:

- EPA Victoria 2009, Industrial Waste Resource Guidelines (IWRG) Publication IWRG701, sampling and analysis of waters, wastewaters, soils and wastes;

- EPA Victoria (2000) *Groundwater sampling guidelines*. Publication 669. EPA Information Bulletin
- National Environment Protection Council (NEPC) 1999 *National environment protection (assessment of site contamination) measure*
- Standards Australia 1997 *Guide to the sampling and investigation of potentially contaminated soil (Part 1: Non-volatile and semi-volatile compounds.* AS 4482.1)
- Standards Australia 1999 *Guide to the sampling and investigation of potentially contaminated soil (Part 2: Volatile substances).* AS 4482.1

Measurement data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. Although not necessarily considered in list order, the following items should form part of the QA/QC data evaluation:

- measured Parameters: precision, accuracy, repeatability (comparability) and blanks; and
- assessed Parameters: completeness, representative of site conditions, sensitivity and holding times.

The laboratories used should be NATA accredited for the analytical methods performed. Containers, sample preservation (if necessary) and holding times should be consistent with industry practices as set out in NEPM and as defined by ASTM.

The QA parameters selected and the criteria used to evaluate the analytical data are defined below and presented in Table 1 of this report.

3.1.1 Repeatability (Field collected intra-laboratory duplicates)

These samples provide a check on the analytical performance of the laboratory. At least 5 percent of groundwater samples (1 in 20) from a site are collected in duplicate. For comparability of data, it is important that there is little delay in the sample submission. For split samples, because of error associated with field splitting, an RPD of between 80 and 150% (depending on the substance) will be allowed as the MDQI.

Any value >50% RPD will be noted and discussed, as per Standards Australia requirements, with respect to its acceptability for inclusion in the data-set.

3.1.2 Precision

Precision is a measure of the reproducibility of results, and is assessed on the basis of agreement between a set of replicate results obtained from duplicate analyses. The precision of a duplicate determination can be measured as relative percentage difference (RPD), and is calculated from the following equation:

$$RPD = \left[\frac{X1 - X2}{\left(\frac{X1 + X2}{2} \right)} \right] \times 100$$

where: X1 is the first duplicate value
X2 is the second duplicate value

The groundwater intra- and inter-laboratory duplicates and calculated RPDs are presented in Table 2 and Table 3.

3.1.3 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. The determination of accuracy can be achieved through the analysis of known reference materials or assessed by the analysis of matrix spikes. Accuracy is measured in terms of percentage recovery as defined by the following equation:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where: %R = percentage recovery of the spike
SSR = spiked sample result
SR = sample result (native)
SA = spike added

Laboratory personnel calculate percentage recoveries of spiked compounds, which are evaluated against control or acceptance limits taken from the appropriate method or the Contract Laboratory Program Statement of Work. If the spike recovery for a sample does not fall within the prescribed control limits, laboratory based corrective action is required.

Surrogate spikes consist of spiking non-target compounds into the sample prior to analysis. The spiked compounds are expected to behave during analysis in the same way as the target compounds. Every sample is spiked prior to extraction or analysis with surrogate compounds that are representative of the analysis. If surrogate spike recovery does not meet the prescribed control limits, samples should be reanalysed.

For inorganic analyses, certified reference materials are analysed (for SAL this is BCSS-1).

3.1.4 Representativeness

Data Point Evaluation
Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition.

Representativeness is primarily dependent on the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handling and analysis protocols, and use of proper chain-of-custody and documentation procedures. Blanks, holding times and field duplicates (intra- and inter-laboratory) are all QA parameters that can assist in the analysis of representativeness for data point evaluation and will need to be analysed as part of the measurement data quality assessment.

Data Set Evaluation
Whether the data is representative of the site is checked in part by undertaking an evaluation of the whole data set to establish the data is compatible. Data compatibility is authenticated by confirming that the laws of chemistry are upheld (i.e. nitrate is not present when Eh is -250 mV), that intra-laboratory analysis relationships are consistent (i.e. BTEX is a subset of the TPH C_6-C_9 fraction), that observations and field measurements are in agreement with

other field data and the laboratory data and that results are consistent with the geology, history and logic.

3.1.5 Completeness

The following information is required to check for completeness of data sets:

- chain-of-custody forms (completed by Environmental Earth Sciences VIC and the laboratory);
- sample receipt forms;
- all requested sample results reported;
- all blank data reported;
- all laboratory duplicates reported and RPDs calculated;
- all surrogate spike data reported;
- all matrix spike data reported; and
- NATA stamp on reports.

3.1.6 Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample location, tempreture, sampling procedures) under which separate sets of data are produced to ensure minimal common error. Data comparability should be demonstrated by the use of standardised sampling and analysis procedures. Data comparability was maintained by undertaking the investigations as follows:

- the groundwater samples collected during the investigation were conducted by trained Environmental Earth Sciences VIC field team using Environmental Earth Sciences' standard operating procedures;
- all samples were collected using push tube sampling methods; and
- the same laboratories (ALS and LabMark) were used for organic and inorganic analysis for all relevant samples and using the same NATA approved analytical methods.

3.1.7 Sensitivity

When interferences are present in the sample, a loss of sensitivity can occur resulting in an increase in the method detection limit. In some instances (e.g. where one or more compounds have particularly high concentrations), the sample must be diluted for analysis. This increases the method detection limit by the dilution factor.

The detection limits achieved by the laboratory, when adjusted for dry weight and interferences from the presence of other chemicals within the sampled matrix, must be less than half the site criteria for all analytes tested (i.e. 2 x LOR <site criteria).

3.1.8 Blanks

To meet the QC acceptance criteria, laboratory blanks should have no detectable concentrations of the target compounds. Trip blanks (taken to and returned from the field) and rinsate blanks (taken in the field) will only be necessary for analysing dissolved metals and volatile organic compounds in water samples where the threshold value is near the detection limit for an individual compound or element.

3.1.9 Holding times

Where standard holding times are exceeded, a discussion, using professional judgement, as to the integrity of the data will be required, taking into account such factors as field storage, laboratory storage and even sample bottle characteristics.

3.1.10 Procedures for anomalous samples and confirmation checking

All results should be checked for discrepancies by the project manager, against the anticipated results and all other results, within 8 hours of receipt of the results from the laboratory.

Any result that is considered by the supervising scientist to be unusually high or at variance with other results is automatically reanalysed. A significantly different result requires immediate remedial action on the whole sample batch (retesting or using an alternative analytical method) at the laboratory's expense.

After appropriate checking by laboratories, all sample analysis results work-sheets, including those of duplicates and replicate analyses, should be checked by the consultant. Once confirmation checking is completed the final laboratory report is issued.

For intra-laboratory duplicates, if one sample has more than two analytes exceeding the data quality objectives, the sample is carefully checked. If the error is not apparent, the sample is rejected. If more than three samples are rejected all the samples collected at that time are rejected. These samples are then re-sampled and reanalysed.

3.2 Field QA/QC

3.2.1 Details of sampling team

Fieldwork was conducted using the following personnel:

- Groundwater well integrity inspection: David James and Jarrod Irving;
- Groundwater well construction and installation: David James, Simon Meich, Shane Furlong and Alan Wade;
- Groundwater well development: Jarrod Irving and Laura Boland;
- Groundwater sampling for chemical analysis: David James, Katy Kijek, Laura Boland and Jarrod Irving; and
- Groundwater physical analysis: David James, Jordan Fraser and Alan Wade.

3.2.2 Groundwater sampling methodology

Groundwater sampling at each existing and newly installed groundwater well was undertaken between 18 and 21 April 2011. Prior to purging, a multi-phase dipper was used to measure the SWL in each well and to assess the presence of LNAPL or DNAPL if any.

Sampling was undertaken via low flow (Micro-purge) sampling techniques, with the pump inlet placed at depths within the screen interval. Purging was continued until field parameters [pH, electrolytic conductivity (EC), oxidation/reduction potential (ORP or pe), dissolved oxygen (DO), temperature and flow rate (yield)] had stabilised (refer to Table 5) and a sustainable sampling flow rate (i.e. minimal draw down) had been established to confirm that a representative sample of the aquifer was collected.

Groundwater well GW4 displayed insufficient yield to sustain an adequate flow rate with minimal drawdown. As such, purging and collection of field parameters was continued using a hand bailer until the well was purged dry and was sampled following adequate recharge.

Groundwater samples were collected in amber glass bottles, volatile vials or plastic bottles depending on the individual analytes and required preservatives, labelled with the groundwater well number, site reference and date before being placed in a cooler with ice. All sampling procedures were undertaken in accordance with Environmental Earth Sciences, 2009, *Soil, gas & groundwater sampling manual* and EPA Publication 669, 2000, *Groundwater sampling guidelines*. Decontamination practices included the following:

- use of individual pump bladders and tubing at each groundwater well; and
- washing of all re-used sampling equipment (i.e. pump and steel cable) with detergent (Decon 90) water, double rinsing with clean water prior to collection of each sample.

3.2.3 Sampling controls

Decontamination procedures carried out between sampling events
All sampling equipment to be re-used which came into contact with groundwater or soil samples, were thoroughly washed with detergent (Decon 90 or similar) water, then rinsed with clean water and dried before the collection of each sample. Any items accidentally contaminated were similarly washed before re-use. New nitrile gloves were used at each sampling location.

Individual pump bladders and tubing were used for each groundwater well, reducing the risk of cross contamination. Between each location, the flow cell and water quality metres were rinsed using a mixture of orange based surfactant and distilled water, followed by a rinse with distilled water. Groundwater samples were collected directly from the pump tubing and did not pass through the flow cell. Sampling for groundwater was conducted in the order of least to potentially most chemically impacted.

Sample notation details
The chemical analyses to be performed on each sample are presented on the chain of custody documentation (Appendix C) which also identify for each sample – the sampler, nature of the sample, collection date, analyses to be performed, sample preservation method (if any), departure time from the site and dispatch courier.

Rinsate and trip blanks
The rinsate blank Rinsate-1 (18/04/11), Rinsate-2 (19/04/2011), Rinsate-3 (20/04/2011) and Rinsate-4 (21/04/2011) were collected after washing and triple rinsing the sampling equipment from the final sampling location at the end of each sampling day (i.e. April 2011 GME). No rinstate blank was collected following the sampling of GW07 on 2/5/2011.

Rinsate blanks was analysed for TPH and VOC with all concentrations recorded below laboratory detection limits.

Groundwater trip blank samples Trip-1 (18/04/2011), Trip-2 (19/04/2011), Trip-3 (20/04/2011) and Trip-4 (21/04/2011) were collected from laboratory prepared trips blanks (one trip blank per esky containing volatiles) taken to and returned from the field during each sampling day (i.e. April 2011 GME). No trip blank was taken to and returned from the field during the sampling of GW07 on 2/5/2011.

The trip blanks were analysed for TPH and VOC with all concentrations also recorded below laboratory detection limits.

3.2.3 Field instrument calibration

The following field instruments were calibrated for the groundwater bore development and sampling program. Field calibration was undertaken twice daily are recorded within field note. Field calibration records are presented in Appendix F

TABLE 8 INSTRUMENT CALIBRATION

Meter	Parameter	Calibration
Groundwater Monitoring Event - 18 April – 21 April 2011		
Hanna HI 92000	pH, temperature	2-point (pH 4.01 & 7.01)
Hanna HI 92000	Eh (redox)	Standard Solution (250 mV)
Hanna HI 92000	EC (electrolytic conductivity)	2-point (2.76 & 12.88 mS/cm)
Hanna HI 92000	Dissolved Oxygen (DO)	2-point (0 & 100% DO)
Groundwater Monitoring Event - 2 May 2011		
Hanna HI 92000	pH, temperature	2-point (pH 4.01 & 7.01)
Hanna HI 92000	Eh (redox)	Standard Solution (250 mV)
Hanna HI 92000	EC (electrolytic conductivity)	2-point (2.76 & 12.88 mS/cm)
Hanna HI 92000	Dissolved Oxygen (DO)	2-point (0 & 100% DO)

Field equipment used for the groundwater investigation was appropriate for the required works and was used in the appropriate manner. The instruments were calibrated in accordance with the manufacturer specifications and Environmental Earth Sciences VIC QA/QC documentation. Refer to Appendix J of the report for calibration records

3.3 Laboratory QA/QC

Organic and inorganic analysis for this project was completed Australian Laboratory Services (ALS), with the inter-laboratory duplicate sample being analysed by SGS Australia Laboratories. Both laboratories are accredited by NATA for the methods used, details of this accreditation can be viewed at http://www.nata.asn.au/, while details of the samples sent to each laboratory and the analysis requested are contained in the chain of custody documentation held in Appendix C.

Samples were analysed within the appropriate holding times, with the exception to the following:

- ALS EM1104286 – the analysis for pH exceeded the holding time by 6 days for GW42D and SPLIT 4, 7 days for GW03, GW04, GW10, GW11, GW13, GW14, GW15, GW16, GW19, GW21, GW22, GW23, GW24, GW25, GW27, GW36, GW39, GW40, GW41, GW43D, GW44D, DUP 1, SPLIT 1, DUP 3, SPLIT 3 and DUP 4, and 8 days for GW9 and GW12; and

- ALS EM1104286 – the analysis of sulfide exceeded the holding time by 1 day for GW9 and GW12.

Although sulfide exceeded the holding time by 1 day respectively, discussions with ALS conclude that such a breach in holding time is unlikely to adversely affect the analytical results reported.

Similarly, even though the holding times for pH in all samples exceed the allowable holding times, the analysis of CoPC were within the holding times, therefore the exceedence listed above is not considered to affect the quality or integrity of the data presented. Furthermore, pH values correlated with field measurements, demonstrating that the water chemistry had not altered significantly between sampling and analysis.

The detailed internal laboratory QA/QC reports are presented in the laboratory transcripts of Appendix C. The results of the laboratory QC program are summarized below:

- laboratory duplicate tests reported RPDs within acceptable range;
- method blank concentrations were reported below laboratory limit of reporting;
- laboratory control spike reported recoveries within the acceptable range, with exception to vinyl chloride (ALS EM1104104 Amendment 1) which recorded a recovery of 59.6% (less than the lower recovery limit of 61%);
- matrix spike reported recoveries within the acceptable range, with exception to the following:
    - 1.1-dichloroethene (ALS EM1104104 Amendment 1) which recorded a recovery of 107% (more than the upper recovery limit of 104%);
    - sulfate (ALS EM1104104 Amendment 1, ALS EM1104161 Amendment 1, ALS EM1104286 Amendment 1 and ALS EM1104593 Amendment 1) spike recovery was not determined;
    - nitrate and nitrite (ALS EM1104104 Amendment 1, ALS EM1104161 Amendment 1 and ALS EM1104286 Amendment 1) spike recovery was not determined;
    - chloride (ALS EM1104286 Amendment 1) spike recovery was not determined; and
    - 1.1-dichloroethene (ALS EM1104286 Amendment 1) which recorded a recovery of 119% (more than the upper recovery limit of 104%).
- surrogates reported recoveries within the acceptable range.

Overall, SGS and ALS internal laboratory QA/QC results demonstrate that the laboratory QA/QC program was satisfactory for the groundwater investigation. Although it is noted that the one parameter of the laboratory control spike and ten parameters of the matrix spike did not meet the acceptable range, this is considered insignificant compared to the number of parameters, reported in multiple laboratory transcripts, which did meet the acceptable range.

The overall rate of internal laboratory QA/QC performed is considered acceptable to achieve reliability on the results used to reach the conclusions.

3.3.1 Duplicate sampling

Duplicate samples were collected at a rate of one duplicate per twenty samples collected (5%) during the groundwater investigation. Intra- and inter-laboratory duplicate analysis results are presented in Table 2 and Table 3.

For this project, 39 primary groundwater samples were analysed with four groundwater intra- and four inter-laboratory duplicates were collected during fieldwork, however confusion during sample laboratory sorting resulted in seven intra-laboratory and one inter-laboratory samples being analysed. Intra- and inter-laboratory duplicates were analysed for:

- pH, TDS, free CN, Na^{+}, Ca^{2+}, Mg^{2+}, K^{+}, NH^{4+},Cl^{-}, SO_4^{2-}, HCO_3^{-}, NO_3^{-}, NO_2^{-}, PO_4^{3-}, F^{-};
- heavy metals (Al, As, Cd, Cu, CrVI, Fe, Pb, Ni, Zn, Co, Se, Bo, Mn and Hg);
- total petroleum hydrocarbons (TPH fractions C_6-C_{36});
- polycyclic aromatic hydrocarbons (PAH); and
- volatile organic compounds (VOC) including naphthalene by VOC.

Although, the number of inter-laboratory duplicates is not considered acceptable for the project, Environmental Earth Sciences did initially intend to analyse an acceptable number of inter- duplicates. The analysis of seven intra-laboratory duplicates and one inter-laboratory duplicate was a result of a laboratory error. Nevertheless, a review of the data presented in Table 4 and 5 suggests that the data obtained from SGS is reliable compared to the primary laboratory (ALS) with only two parameters reported with a RPD > 50%, however when compared against Table 1 MDQI criteria, all results are acceptable. Environmental Earth Sciences will ensure the correct number of intra- and inter-laboratory duplicates are collected and analysed during future GMEs (if any).

TABLE 2 GROUNDWATER INORGANIC INTRA – LABORATORY DUPLICATE QA/QC RESULTS

Analyte	MDL	GW3	DUP1	RPD%	GW3	SPLIT 1*	RPD%	GW28	DUP2	RPD%	GW24	DUP3	RPD%	GW24	SPLIT 3*	RPD%	GW42D	DUP4	RPD %	GW42D	SPLIT 4*	RPD%
		20/04/11	20/04/11		20/04/11	20/04/11		19/04/11	19/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11	
pH Value	0.01	6.6	6.49	1.7	6.6	6.4	3.1	7.65	7.66	0.1	7.25	7.34	1.2	7.25	7.31	0.8	6.3	6.22	1.3	6.3	6.29	0.2
TDS	5	3410	3270	4.2	3410	3100	9.5	1540	1600	3.8	4430	4170	6.0	4430	4340	2.1	23400	22600	3.5	23400	21500	8.5
Bicarbonate	1	295	224	27.3	295	226	26.4	447	443	0.8	828	831	0.3	828	833	0.6	174	165	5.3	174	170	2.3
Sulfate	1	2070	2140	3.3	2070	1950	6.0	167	180	7.5	2340	2710	14.7	2340	2470	5.4	14800	14800	0.0	14800	15000	1.3
Sulphide	0.1	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd
Chloride	1	64	66	3.1	64	64	0.0	332	330	0.6	42	43	2.4	42	46	9.1	3380	2620	25.3	3380	2920	14.6
Calcium	1	232	246	5.9	232	243	4.6	30	33	9.5	55	50	9.5	55	47	15.7	375	396	5.4	375	386	2.9
Magnesium	1	43	46	6.7	43	45	4.5	26	27	3.8	38	36	5.4	38	35	8.2	787	812	3.1	787	785	0.3
Sodium	1	62	70	12.1	62	68	9.2	351	360	2.5	67	57	16.1	67	55	19.7	2450	2580	5.2	2450	2450	0.0
Potassium	1	16	16	0.0	16	15	6.5	6	6	0.0	21	16	27.0	21	16	27.0	217	224	3.2	217	216	0.5
Free Cyanide	0.004	0.005	0.007	33.3	0.005	0.014	**94.7**	<0.004	<0.004	nd	0.01	0.01	0.0	0.01	0.011	9.5	0.013	0.016	20.7	0.013	0.021	47.1
Total Cyanide	0.004	0.07	0.07	0.0	0.07	0.072	2.8	0.033	0.032	3.1	0.219	0.253	14.4	0.219	0.211	3.7	0.434	0.509	15.9	0.434	0.456	4.9
WAD Cyanide	0.004	0.009	0.016	**56.0**	0.009	0.014	43.5	<0.004	<0.004	nd	0.021	0.021	0.0	0.021	0.024	13.3	0.044	0.046	4.4	0.044	0.037	17.3
Fluoride	0.1	1.3	1.1	16.7	1.3	1.1	16.7	1.4	1.4	0.0	0.3	0.3	0.0	0.3	0.3	0.0	1	1	0.0	1	1	0.0
Ammonia as N	0.01	660	452	37.4	660	460	35.7	76.3	87.7	13.9	854	1000	15.7	854	1020	17.7	2170	2100	3.3	2170	2160	0.5
Nitrite as N	0.01	<0.01	<0.01	nd	<0.01	<0.01	nd	0.01	0.11	**166.7**	0.02	0.04	**66.7**	0.02	0.02	0.0	0.02	0.05	**85.7**	0.02	0.02	0.0
Nitrate	0.01	<0.04	<0.04	nd	<0.04	<0.04	nd	<0.04	<0.04	nd	23.7	17.45	30.4	23.7	16.4	36.4	<0.04	<0.04	nd	<0.04	0.04	nd
Nitrogen	0.01	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	5.37	3.98	30	5.37	3.74	36	0.03	0.05	50	003	0.04	29
Phosphate	0.01	<0.03	<0.03	nd	<0.03	<0.03	nd	<0.03	<0.03	nd	<0.03	<0.03	nd	<0.03	<0.03	nd	<0.03	<0.03	nd	<0.03	<0.03	nd
Aluminium	0.01	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	0.02	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	3.91	3.15	21.5	3.91	3.02	25.7
Arsenic	0.001	0.01	0.012	18.2	0.01	0.01	0.0	0.189	0.201	6.2	0.039	0.041	5.0	0.039	0.043	9.8	0.031	0.025	21.4	0.031	0.025	21.4
Cadmium	0.0001	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	0.0012	0.0013	8.0	0.0012	0.0013	8.0
Cobalt	0.001	0.021	0.024	13.3	0.021	0.024	13.3	<0.001	<0.001	nd	0.001	0.002	**66.7**	0.001	0.002	**66.7**	9.66	9.63	0.3	9.66	9.37	3.0
Copper	0.001	0.001	0.001	0.0	0.001	0.001	0.0	0.002	0.001	**66.7**	0.004	0.004	0.0	0.004	0.003	28.6	0.051	0.048	6.1	0.051	0.045	12.5
Lead	0.001	<0.001	<0.001	nd	<0.001	<0.001	nd	0.003	0.004	28.6	0.002	0.001	**66.7**	0.002	0.002	0.0	0.002	0.001	**66.7**	0.002	<0.001	nd
Manganese	0.001	4.18	4.03	3.7	4.18	3.88	7.4	0.17	0.169	0.6	0.019	0.021	10.0	0.019	0.02	5.1	120	121	0.8	120	118	1.7
Nickel	0.001	0.014	0.02	35.3	0.014	0.007	**66.7**	0.014	0.01	33.3	0.012	0.013	8.0	0.012	0.015	22.2	2.82	2.84	0.7	2.82	2.81	0.4
Selenium	0.01	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	0.03	0.03	0.0	0.03	0.03	0.0
Zinc	0.005	0.017	0.071	**122.7**	0.017	0.013	26.7	<0.005	0.005	nd	0.013	0.012	8.0	0.013	0.013	0.0	2.2	2.16	1.8	2.2	2.15	2.3
Boron	0.05	1.3	1.37	5.2	1.3	1.39	6.7	0.74	0.78	5.3	0.32	0.33	3.1	0.32	0.34	6.1	0.66	0.66	0.0	0.66	0.67	1.5
Iron	0.05	27	21.7	21.8	27	20.6	26.9	<0.05	<0.05	nd	0.13	0.1	26.1	0.13	0.11	16.7	12.9	12.8	0.8	12.9	12.4	4.0
Mercury	0.0001	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	<0.0001	<0.0001	nd	0.0002	<0.0001	nd	0.0002	<0.0001	nd
Chromium VI	0.01	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd	<0.01	<0.01	nd

Note(s):

1. MDL = method detection limit
2. *four groundwater intra- and four inter-laboratory duplicates were collected during fieldwork, however confusion during sample laboratory sorting resulted seven intra-laboratory and one inter-laboratory samples being analysed. Hence, samples labelled SPLIT 1, SPLIT 3 and SPLIT 4 (in the table above) are intra-laboratory duplicates (as they were analysed by ALS laboratories) rather than inter-laboratory duplicates as the sample nomenclature suggests
3. - = not analysed
4. RPD = relative percentage difference
5. nd = RPD not calculable
6. all units in mg/L
7. some laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Reactive Phosphorous P to Phosphate PO_4 (x 3.06), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219)
8. Acceptance Criteria (see Table 1)
   - no limit applies to <5x MDL;
   - 80-150% for low level (5x – 10 x MDL); and
   - 50% for medium to high level (>10x MDL).

TABLE 3 GROUNDWATER ORGANIC INTRA – LABORATORY DUPLICATE QA/QC RESULTS

Analyte	LOR	GW3	DUP1	RPD%	GW3	SPLIT 1*	RPD%	GW28	DUP2	RPD%	GW24	DUP3	RPD%	GW24	SPLIT 3*	RPD%	GW42D	DUP4	RPD%	GW42D	SPLIT 4*	RPD%
		20/04/11	20/04/11		20/04/11	20/04/11		19/04/11	19/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11	
Oxygenated Compounds																						
2-Butanone (MEK)	50	<50	<50	nd	<50	<50	nd	<50	<50	nd	<1000	<1000	nd	<1000	<1000	nd	<50	<50	nd	<50	<50	nd
Halogenated Aromatic Compounds																						
Chlorobenzene	5	<5	<5	nd	<5	<5	nd	<5	<5	nd	<100	<100	nd	<100	<100	nd	8	8	0	8	8	0
Chlorinated Hydrocarbons																						
Chloroform	5	<5	<5	nd	<5	<5	nd	<5	<5	nd	<100	<100	nd	<100	<100	nd	<5	5	nd	<5	<5	nd
Tetrachloroethene	5	<5	<5	nd	<5	<5	nd	<5	<5	nd	<100	<100	nd	<100	<100	nd	<5	5	nd	<5	<5	nd
Polynuclear Aromatic Hydrocarbons (PAH)																						
Naphthalene	5	<5	1.4	nd	1.2	1.6	28.6	<5	<5	nd	4,530	2980	41.3	1,820	2710	39.3	33	25.5	25.6	21.3	27.3	24.7
Acenaphthylene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	58.1	23.9	**83.4**	58.1	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Acenaphthene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	14.6	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Fluorene	1	1	<1.0	nd	1	<1.0	nd	<1.0	<1.0	nd	20.2	15.4	27.0	20.2	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Phenanthrene	1	3.4	<1.0	nd	3.4	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Anthracene	1	1.1	<1.0	nd	1.1	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Fluoranthene	1	2.4	<1.0	nd	2.4	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Pyrene	1	2	<1.0	nd	2	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Benz(a)anthracene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Chrysene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Benzo(b)fluoranthene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Benzo(k)fluoranthene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<5.5	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Benzo(a)pyrene	0.5	<0.6	<0.6	nd	<0.6	<0.6	nd	<0.5	<0.5	nd	5.6	5.6	0.0	<5.6	<10.0	nd	<0.5	<0.6	nd	<0.5	<0.6	nd
Indeno(1.2.3.cd)pyrene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Dibenz(a.h)anthracene	1	<1.0	<1.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	<10.0	nd	<1.0	<1.0	nd	<1.0	<1.0	nd
Benzo(g.h.i)perylene	1	<1.0	<1.0	nd	<1.0	1.6	nd	<1.0	<1.0	nd	<10.0	<10.0	nd	<10.0	2760	nd	<1.0	<1.0	nd	<1.0	27.3	nd
Monocyclic Aromatic Hydrocarbons																						
Styrene	5	<5	<5	nd	<5	<5	nd	<5	<5	nd	193	196	1.5	193	205	6.0	<5	<5	nd	<5	<5	nd
1.2.4-Trimethylbenzene	5	<5	<5	nd	<5	<5	nd	<5	<5	nd	185	205	10.3	185	220	17.3	<5	<5	nd	<5	<5	nd
BTEX																						
Benzene	1	2	3	40.0	2	3	40.0	<1	<1	nd	6,350	5,340	17.3	6,350	5,250	19.0	355	334	6.1	355	364	2.5
Toluene	2	<2	3	nd	<2	3	nd	<2	<2	nd	318	282	12.0	318	287	10.2	61	63	3.2	61	62	1.6
Ethylbenzene	2	<2	3	nd	<2	3	nd	<2	<2	nd	111	116	4.4	111	119	7.0	3	3	0.0	3	3	0.0
meta- & para-Xylene	2	3	6	**66.7**	3	6	**66.7**	<2	<2	nd	1,550	1,560	0.6	1,550	1,600	3.2	11	11	0.0	11	10	9.5
ortho-Xylene	2	<2	4	nd	<2	4	nd	<2	<2	nd	739	728	1.5	739	766	3.6	9	9	0.0	9	9	0.0

TABLE 3 GROUNDWATER ORGANIC INTRA – LABORATORY DUPLICATE QA/QC RESULTS (CONTINUED)

Analyte	LOR	GW3	DUP1	RPD%	GW3	SPLIT 1*	RPD%	GW28	DUP2	RPD%	GW24	DUP3	RPD%	GW24	SPLIT 3*	RPD%	GW42D	DUP4	RPD%	GW42D	SPLIT 4*	RPD%
		20/04/11	20/04/11		20/04/11	20/04/11		19/04/11	19/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11		20/04/11	20/04/11	
Total Petroleum Hydrocarbons (TPH)																						
TPH C_6 - C_9 Fraction	20	<20	30	nd	<20	40	nd	<20	<20	nd	9780	9,990	2.1	9780	10,200	4.2	470	480	2.1	470	460	2.2
TPH C_{10} - C_{14} Fraction	50	420	480	13.3	420	530	23.2	<50	<50	nd	14,200	14,200	0.0	14,200	12,400	13.5	2,960	2,910	1.7	2,960	3,070	3.6
TPH C_{15} - C_{28} Fraction	100	1,440	1410	2.1	1,440	1,480	2.7	<100	<100	nd	6,120	5,510	10.5	6,120	4,760	25.0	1,560	1,500	3.9	1,560	1,880	18.6
TPH C_{29} - C_{36} Fraction	50	150	230	42.1	150	180	18.2	<50	<50	nd	220	150	37.8	220	140	44.4	200	200	0.0	200	280	33.3
TPH C_{10} - C_{36} Fraction (sum)	50	2,010	2120	5.3	2,010	2,190	8.6	<50	<50	nd	20,500	19,900	3.0	20,500	17,300	16.9	4,720	4,610	2.4	4,720	5,230	10.3
Total Recoverable Hydrocarbons (TRH)																						
TRH C_6 – C_{10} Fraction	20	<20	50	nd	<20	50	nd	<20	<20	nd	9720	9930	2.1	9720	10100	3.8	480	480	0	480	470	2.1
TRH C_6 – C_{10} Fraction minus BTEX	20	<20	30	nd	<20	30	nd	<20	<20	nd	<2000	<2000	nd	<2000	2080	nd	40	60	40	40	20	**66.6**
>TRH C_{10} – C_{16} Fraction	100	610	710	15.1	610	790	25.7	<100	<100	nd	14600	14200	2.7	14600	12200	17.9	1750	1700	2.8	1750	1840	5.0
>TRH C_{16} – C_{34} Fraction	100	1300	1320	1.5	1300	1340	3.0	<100	<100	nd	4670	4320	7.7	4670	3740	22.1	1410	1370	2.8	1410	1760	22.0
>TRH C_{34} – C_{40} Fraction	100	<100	190	nd	<100	130	nd	<100	<100	nd	<100	<100	nd	<100	<100	nd	110	100	9.5	110	180	48.2
>TRH C_{10} – C_{40} Fraction (sum)	100	1910	2220	15.0	1910	2260	16.7	<100	<100	nd	19300	18500	4.2	19300	15900	19.3	3270	3170	3.1	3270	3780	14.4

Note(s):

1. *four groundwater intra- and four inter-laboratory duplicates were collected during fieldwork, however confusion during sample laboratory sorting resulted seven intra-laboratory and one inter-laboratory samples being analysed. Hence, samples labelled SPLIT 1, SPLIT 3 and SPLIT 4 (in the table above) are intra-laboratory duplicates (as they were analysed by ALS laboratories) rather than inter-laboratory duplicates as the sample nomenclature suggests
2. RPD = relative percentage difference
3. nd = RPD not calculable
4. all units in ug/L
5. Acceptance Criteria (see Table 1)
   - no limit applies to <5x MDL;
   - 80-150% for low level (5x – 10 x MDL); and
   - 50% for medium to high level (>10x MDL).

TABLE 4 GROUNDWATER INORGANIC INTER – LABORATORY DUPLICATE QA/QC RESULTS

Analyte	LOR	GW28	SPLIT 2	RPD%
		19/04/11	19/04/11	
pH Value	0.01	7.65	7.8	1.9
TDS	5	1540	920	**50.4**
Bicarbonate	1	447	475	6.0
Sulfate	1	167	200	18.0
Sulfide	0.1	<0.1	0.5	**133**
Chloride	1	332	300	10.1
Calcium	1	30	32	6.5
Magnesium	1	26	24	8.0
Sodium	1	351	240	37.6
Potassium	1	6	6.8	12.5
Free Cyanide	0.004	<0.004	0.016	nd
Total Cyanide	0.004	0.033	0.029	12.9
WAD Cyanide	0.004	<0.004	0.009	nd
Fluoride	0.1	1.4	1.1	24.0
Ammonia as N	0.01	76.3	-	nd
Nitrite as N	0.01	0.01	0.005	**66.7**
Nitrate	0.01	<0.04	<0.04	nd
Phosphate	0.01	<0.03	<0.005	nd
Aluminium	0.01	<0.01	0.041	nd
Arsenic	0.001	0.189	0.19	0.5
Cadmium	0.0001	<0.0001	<0.0001	nd
Cobalt	0.001	<0.001	<0.001	nd
Copper	0.001	0.002	<0.001	nd
Lead	0.001	0.003	<0.001	nd
Manganese	0.001	0.17	0.19	11.1
Nickel	0.001	0.014	0.009	43.5
Selenium	0.01	<0.01	<0.002	nd
Zinc	0.005	<0.005	0.003	nd
Boron	0.05	0.74	0.70	5.6
Iron	0.05	<0.05	0.59	nd
Mercury	0.0001	<0.0001	<0.0005	nd
Chromium VI	0.01	<0.01	<0.005	nd

Note(s):

1. MDL = method detection limit
2. - = not analysed
3. RPD = relative percentage difference
4. nd = RPD not calculable
5. all units in mg/L
6. some laboratory results have been converted to allow for the comparison against guidelines: Nitrate as N to Nitrate NO_3= (x 4.43), Total Alkalinity as CaCO3 to Bicarbonate HCO_3 (x 1.219)
7. Acceptance Criteria (see Table 1)
   - no limit applies to <5x MDL;
   - 80-150% for low level (5x – 10 x MDL); and
   - 50-130% for medium to high level (>10x MDL).

TABLE 5 GROUNDWATER ORGANIC INTER – LABORATORY DUPLICATE QA/QC RESULTS

Analyte	LOR	GW28	SPLIT 2	RPD%
		19/04/11	19/04/11	
Oxygenated Compounds				
2-Butanone (MEK)	50	<50	<50	nd
Chlorinated Hydrocarbons				
Tetrachloroethene	0.5	<5	2.1	nd
Polynuclear Aromatic Hydrocarbons (PAH)				
Naphthalene	1/0.2*	<1.0	<0.2	nd
Acenaphthylene	1/0.2*	<1.0	<0.2	nd
Acenaphthene	1/0.2*	<1.0	<0.2	nd
Fluorene	1/0.2*	<1.0	<0.2	nd
Phenanthrene	1/0.2*	<1.0	<0.2	nd
Anthracene	1/0.2*	<1.0	<0.2	nd
Fluoranthene	1/0.2*	<1.0	<0.2	nd
Pyrene	1/0.2*	<1.0	<0.2	nd
Benz(a)anthracene	1/0.2*	<1.0	<0.2	nd
Chrysene	1/0.2*	<1.0	<0.2	nd
Benzo(b)fluoranthene	1/0.2*	<1.0	<0.2	nd
Benzo(k)fluoranthene	1/0.2*	<1.0	<0.2	nd
Benzo(a)pyrene	0.5/0.2*	<0.5	<0.2	nd
Indeno(1.2.3.cd)pyrene	1/0.2*	<1.0	<0.2	nd
Dibenz(a.h)anthracene	1/0.2*	<1.0	<0.2	nd
Benzo(g.h.i)perylene	1/0.2*	<1.0	<0.2	nd
Monocyclic Aromatic Hydrocarbons				
Styrene	5	<5	<5	nd
1.2.4-Trimethylbenzene	5	<5	<5	nd
BTEX				
Benzene	1	<1	<1	nd
Toluene	2	<2	<2	nd
Ethylbenzene	2	<2	<2	nd
meta- & para-Xylene	2	<2	<2	nd
ortho-Xylene	2	<2	<2	nd
Total Petroleum Hydrocarbons (TPH)				
TPH C_6 - C_9 Fraction	20	<20	<20	nd
TPH C_{10} - C_{14} Fraction	50	<50	<50	nd
TPH C_{15} - C_{28} Fraction	100	<100	260	nd
TPH C_{29} - C_{36} Fraction	50	<50	<50	nd
TPH C_{10} - C_{36} Fraction (sum)	50	<50	<50	nd

Note(s):
1. MDL = method detection limit
2. - = not analysed
3. RPD = relative percentage difference

4. nd = RPD not calculable
5. * = SGS LORs for PAHs
6. all units in ug/L
7. Acceptance Criteria (see Table 1)
   - no limit applies to <5x MDL
   - 80-150% for low level (5x – 10 x MDL)
   - 50-130% for medium to high level (>10x MDL)

3.3.2 Groundwater relative percentage difference values

Table 2 and 3 indicated that all RPD's calculated for intra-laboratory duplicates were all within an acceptable range (≤50%), with the exception to the following:

- acenaphthylene – GW24/DUP3 recorded RPD of 83.4%;
- meta & para xylene – GW3/DUP1 recorded RPD of 66.7%;
- TRP C6-C10 fraction minus BTEX – GW42D/SPLIT 4 recorded RPD of 66.6%; and
- meta & para xylene – GW3/SPLIT 1 recorded RPD of 66.7%.

When compared against Table 1 MDQI criteria, all results are acceptable.

Table 4 and 5 indicated that all RPD's calculated for the inter-laboratory duplicate was within an acceptable range (≤50%), with the exception to the following:

- TDS – GW28/SPLIT2 recorded RPD of 50.4%; and
- nitrite – GW28/DUP2 recorded RPD of 66.67%.

When compared against Table 1 MDQI criteria, all results are acceptable.

3.4 QA/QC data evaluation

Based on information presented in Sections 3.1, 3.2, 3.3 and 3.4 it can be confidently stated that the MDQO's for this project have been met and the data set is considered to be reliable.

4 REFERENCES

APHA 1995, Standard methods for the examination of water and waste-water 19th edition.

Australian and New Zealand Environment and Conservation Council (ANZECC) 1992, *Australian and New Zealand Guidelines for the assessment and management of contaminated sites Australia and New Zealand Environment Council, National Health and Medical Research Council, Melbourne, Victoria.*

Environmental Earth Sciences Pty Ltd 2009, *Soil, gas and groundwater sampling manual,* unpublished.

EPA Victoria 2009, Industrial Waste Resource Guidelines (IWRG) *Publication IWRG701, sampling and analysis of waters, wastewaters, soils and wastes*.

EPA Victoria 2000, *Groundwater sampling guidelines EPA Information Bulletin. Publication 669.*

ISO Standards 1995, *Quality management and quality assurance ISO8402*.

National Environment Protection Council (NEPC) 1999, *National environment protection (assessment of site contamination) measure.*

Rayment & Higginson 1992, *Australian laboratory handbook of soil and water chemical methods.*

Standards Australia 2005, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, AS 4482.1.

Standards Australia, 1999, Guide *to the investigation and sampling of sites with potentially contaminated soil, Part 2: Volatile Substances,* AS 4482.1.

APPENDIX E DEED OF AGREEMENT

140 William Street
Melbourne Vic 3000
PO Box 4301
Melbourne Vic 3001
Australia
DX 147 Melbourne
Tel +61 3 9274 5000
Fax +61 3 9274 5111
www.dlaphillipsfox.com

Deed of Agreement

Groundwater and Gasworks Arts Park, Albert Park

City of Port Phillip
Melbourne Water
South East Water

DLA PHILLIPS FOX

Table of contents

Parties

City of Port Phillip of St Kilda Town Hall, 99a Carlisle Street, St Kilda 3182 (**Council**)

Melbourne Water of 100 Wellington Parade, East Melbourne (**Melbourne Water**)

South East Water ABN 89 066 902 547 of 20 Corporate Drive Heatherton, Victoria 3202 (**South East Water**)

Background

A Council is partly the owner and partly the Committee of Management for the Gasworks Site.

B Melbourne Water is responsible for the South Yarra Main and Hobsons Bay Main pursuant to the *Water Act 1989*.

C South East Water is responsible for the Pickles Street Branch Sewer pursuant to a licence issued under Division 1 of Part 2 of the *Water Industry Act* 1994.

D The Parties enter into this Agreement to:

(a) to ensure that Council is provided with notice of any works to the South Yarra Main Hobsons Bay Main and Pickles Street Branch Sewer;

(b) to achieve and advance the objectives of the Act in respect of the Gasworks Site.

Operative provisions

1 City of Port Phillip obligations

1.1 Council agrees that it will:

1.1.1 prepare a Monitoring Plan and submit it to Melbourne Water and South East Water for approval;

1.1.2 continue to monitor groundwater contamination at and in the vicinity of the South Yarra Main, Hobsons Bay Main and Pickles Street Branch Sewers in accordance with the Monitoring Plan;

1.1.3 supply data relating to groundwater recorded or obtained in the course of implementing the Monitoring Plan to Melbourne Water and South East Water;

1.1.4 notify Melbourne Water and South East Water of any groundwater changes in accordance with the Monitoring Plan;

1.1.5 have and implement a contingency plan to manage the contamination risks posed by groundwater to meet EPA requirements should Melbourne Water or South East Water undertake work to its sewer which increases risks associated with groundwater contamination from the site to an unacceptable level.

2 Melbourne Water obligations

Specific obligations

2.1 Melbourne Water acknowledges that:

2.1.1 groundwater from the Gasworks Site enters the South Yarra Main and Hobsons Bay Main and acknowledges that those mains act as a control for the groundwater.

2.1.2 it has received:

(a) Golder Associates Pty Ltd reports 018 and 019 (**Golder reports**);

(b) email from Ian Kluckow dated 11 July 2008 to Paul Bolger at GHD and Venetia Stewart of GHD regarding SEPP W Model - Gasworks Park;

(c) letter from GHD to Ian Kluckow dated 24 July 2008 regarding South Melbourne Gasworks Audit; and

(d) letter from Golder Associates to Paul Bolger of GHD dated 30 July 2008 in response to comments on the Groundwater Modelling Gasworks Park Precinct.

2.2 Melbourne Water agrees that:

2.2.1 it will accept groundwater from the Gasworks Site into the South Yarra Main and Hobsons Bay Main provided that it maintains the right acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets or does not comply with trade waste requirements or safety requirements imposed by the Victorian Government from time to time;

2.2.2 it will not unreasonably withhold its approval of the Monitoring Plan submitted by Council in accordance with Clause 1.1.1;

2.2.3 it will, subject to Clause 3.2.4, provide Council with eight weeks written notice before commencing any works to the South Yarra Main or Hobsons Bay Main, accompanied by a plan showing the particulars of the proposed works;

2.2.4 in the event that emergency works are required to the South Yarra Main or Hobsons Bay Main, it will provide Council with notification as soon as possible after the commencement of the works.

3 South East Water Obligations

3.1 South East Water acknowledges that:

3.1.1 groundwater from the Gasworks Site enters the Pickles Street Branch Sewer and acknowledges that the Pickles Street Branch Sewer acts as a control for the groundwater.

3.1.2 it has received:

(a) Golder Associates Pty Ltd reports 018 and 019 (**Golder reports**);

(b) email from Ian Kluckow dated 11 July 2008 to Paul Bolger at GHD and Venetia Stewart of GHD regarding SEPP W Model - Gasworks Park;

(c) letter from GHD to Ian Kluckow dated 24 July 2008 regarding South Melbourne Gasworks Audit; and

(d) letter from Golder Associates to Paul Bolger of GHD dated 30 July 2008 in response to comments on the Groundwater Modelling Gasworks Park Precinct.

3.2 South East Water agrees that:

3.2.1 it will accept groundwater that enters the Gasworks Site into the Pickles Street Branch Sewer provided that it maintains the right acting reasonably not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets;

3.2.2 it will not unreasonably withhold its approval of the Monitoring Plan submitted by Council in accordance with Clause 1.1.1;

3.2.3 it will, subject to Clause 4.2.4, provide Council with eight weeks written notice before commencing any works to the Pickles Street Branch Sewer, accompanied by a plan showing the particulars of the proposed works;

3.2.4 in the event that emergency works are required to the Pickles Street Branch Sewer, it will provide Council with notification as soon as possible after the commencement of the works, but no later than the following business day.

4 Notices

Service

4.1 Any notice or communication given to a party under this deed is only given if it is in writing and sent in one of the following ways:

4.1.1 Delivered or posted to that party at its address and marked for the attention of the relevant department or officer (if any) set out below.

4.1.2 Faxed to that party at its fax number and marked for the attention of the relevant department or officer (if any) set out below.

City of Port Phillip

Name:	Sam Hewett
Address:	Private Bag 3, St Kilda VIC 3182
Fax number:	9536 2750
Email address:	shewett@portphillip.vic.gov.au
Attention:	Sam Hewett

Melbourne Water

Name:	Jane Denton Corporate Secretary & Legal Counsel Melbourne Water
Address:	PO Box 4342
Fax number:	9235 2190
Email address:	Jane.Denton@melbournewater.com.au
Attention:	Corporate Secretary

South East Water

Name:	Steve Muir
Address:	40 Commercial Drive, Lynbrook VIC 3975
Fax number:	8788 4132
Email address:	steve.muir@sewl.com.au
Attention:	Steve Muir

Change of address or fax number

4.2 If a party gives the other party three business days notice of a change of its address or fax number, any notice or communication is only given by that other party if it is delivered, posted or faxed to the latest address or fax number.

Time notice is given

4.3 Any notice or communication is to be treated as given at the following time:

4.3.1 If it is delivered, when it is left at the relevant address.

4.3.2 If it is sent by post, two (or, in the case of a notice or communication posted to another country, nine) business days after it is posted.

4.3.3 If it is sent by fax, as soon as the sender receives from the sender's fax machine a report of an error free transmission to the correct fax number.

4.3.4 If it is emailed, as soon as the sender receives confirmed received receipt or confirmation by receipt by email.

However, if any notice or communication is given, on a day that is not a business day or after 5pm on a business day, in the place of the party to whom it is sent it is to be treated as having been given at the beginning of the next business day.

5 Miscellaneous

Commencement of Agreement

5.1 Unless otherwise provided in this Agreement, this Agreement commences from the date of this Agreement.

Ending of Agreement

5.2 This Agreement ends upon the earlier of:

5.2.1 the Authority confirming that the risks posed by the groundwater on, from or under the Gasworks Site are considered acceptable; or

5.2.2 the parties agreeing in writing to terminate this Agreement; or

5.2.3 the South Yarra Main and Hobsons Bay Main and Pickles Street Branch Sewer no longer act as a control for the groundwater.

No fettering of Council's powers

5.3 It is acknowledged and agreed that this Agreement does not fetter or restrict the power or discretion of Council to make any decision or impose any requirements or conditions in connection with the granting of any planning approval or certification of any plans of subdivision applicable to the Gasworks Site or relating to any use or development of the Gasworks Site.

Council cannot withhold approval of Melbourne Water or South East Water works on the basis that it may result in the sewers no longer acting as a groundwater control.

Release

5.4 In the event that the South Yarra Main and/or the Hobsons Bay Main no longer act as groundwater control due to works undertaken by Melbourne Water or South East Water acting reasonably, Council releases Melbourne Water and South East Water from any costs, claims or expenses incurred by Council relating to those works.

No waiver

5.5 Any time or other indulgence granted by Council to Melbourne Water or South East Water or any variation of the terms and conditions of this Agreement or any judgment or order obtained by Council against Melbourne Water or South East Water will not in any way amount to a waiver of any of the rights or remedies of Council in relation to the terms of this Agreement.

Severability

5.6 If a court, arbitrator, tribunal or other competent authority determines that a word, phrase, sentence, paragraph or clause of this Agreement is unenforceable, illegal or void then it must be severed and the other provisions of this Agreement will remain operative.

6 Definitions and interpretation

Definitions

6.1 In this document the following definitions apply:

Act means the *Environment Protection Act 1970* (Vic).

Agreement means this Agreement and any Agreement executed by the Parties expressed to be supplemental to this Agreement.

Authority means the Environment Protection Authority and its successors in title.

Gasworks Site means the land situated at the intersection of Pickles and Graham Streets, Albert Park and being the land identified in the Location Plan attached to this Agreement.

Groundwater has the same meaning as under section 3(1) of the Act.

Hobsons Bay Main means that part of the main sewer located on Graham Street, Albert Park as identified on the Location Plan attached to this Agreement.

Monitoring Plan means the plan, as amended from time to time, to be prepared by Council to the satisfaction of all the parties, detailing the groundwater monitoring to be conducted in the vicinity of the South Yarra Main, Hobsons Bay Main and Pickles Street Branch Sewer.

Party or Parties means Council, Melbourne Water, South East Water and their successors in title.

Pickles Street Branch Sewer means that part of the sewer located on Pickles Street, Albert Park as identified on the Location Plan attached to this Agreement.

South Yarra Main means that part of the sewer located on Bridport Street, Albert Park as identified the Location Plan attached to this Agreement.

Interpretation

6.2 In this document, unless the context otherwise requires:

6.2.1 The singular includes the plural and vice versa.

6.2.2 A reference to a gender includes a reference to each other gender.

6.2.3 A reference to a person includes a reference to a firm, corporation or other corporate body and that person's successors in law.

6.2.4 If a Party consists of more than one person this Agreement binds them jointly and each of them severally.

6.2.5 A term used in this Agreement has its ordinary meaning unless that term is defined in this Agreement. If a term is not defined in this Agreement and it is defined in the Act it has the meaning as defined in the Act.

6.2.6 A reference to an Act or Regulation includes any Acts, Regulations or amendments amending, consolidating or replacing the Act or Regulation.

6.2.7 The introductory clauses to this Agreement are and will be deemed to form part of this Agreement.

Execution and date

Executed as a deed.

Date: 4.1.10

The Common Seal of ~~CITY OF PORT PHILLIP~~ was ~~affixed~~ in the presence of:) Signed under delegated authority on behalf of Port Phillip City Council

.....John Hicks.....

~~Mayor~~

.....

~~Chief Executive Officer~~ G.M. City Infrastructure Services

EXECUTED BY JANE DENTON
of **MELBOURNE WATER**
Its duly appointed Attorney in the presence of

.....

Witness

.....

Attorney

Kathy Uhlik

Name (Print)

JANE DENTON

Date of Power of Attorney 19.5.08

EXECUTED BY _____
of **SOUTH EAST WATER LIMITED**
by its ~~duly appointed Attorney in the~~ Secretary
presence of:

Steve Muir	
Witness	~~Attorney~~ Anthony William Kelly Company Secretary South East Water Limited ACN 066 902 547
STEVE MUIR	
Name (Print)	~~Date of Power of Attorney~~

Attachments

Location Plan

APPENDIX F CALIBRATION CERTIFICATES

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

EQUIPMENT CERTIFICATION REPORT

Sample Pro Micro Purge Low-Flow Bladder Sampling Pump

This Pump has been checked as follows:

Cleaned / checked ☑ Description MP KIT G
Clean and check all components

Date: 15/04/2011

Checked by: Mark

Signature: MB

Please check that the following items are received and all items are returned. Please clean equipment before returning. **A minimum $20 service/repair charge applies to any unclean or damaged items.**

Sent	Received	Returned	Description
☑	☐	☐	QED Sample MicroPurge Pump Serial No: 11561
☑	☐	☐	Pump Operating Field Guide laminated
☑	☐	☐	Pump Controller ID: 10L **Batt Status** GOOD
☑	☐	☐	Pump Controller Blue Airline Hose
☑	☐	☐	Blue Airline Hose **Quick Connect Fitting** for ¼" Airline
☑	☐	☐	Pump Tube & Cap
☑	☐	☐	Hanger Cable S/steel, length 60 m
☑	☐	☐	Hanger Cable Clamp – Black with Orange Tip
☑	☐	☐	Controller Instructions inside case
☑	☐	☐	Compressor ID: TA4101G
☑	☐	☐	Comp connecting Hose & Push lock fittings
☐	☐	☐	Gas Bottle CO2 ID: _____
☐	☐	☐	CO2D Gas Regulator ID: _____ in Carry Case
☐	☐	☐	CO2D Cylinder Gas Regulator Shift Spanner
☐	☐	☐	Gas Bottle Trolley
☐	☐	☐	Cylinder weight… Without Trolley_____KG_
☑	☐	☐	Flow Cell ID: JOCK With Lid: Yes/No
☑	☐	☐	Spare Disposable Bladders, qty 2
☑	☐	☐	Spare balls, Qty 2
☑	☐	☐	Spare o-rings, Qty 2
			Processors Signature/ Initials

QUOTE NO.: 2459A
ID: QSP6P

CLIENT'S REF:P/O No: 210074
CLIENT'S REF:Job No: _____

RETURN DATE: ____/____/____
TIME: _____

CONDITION ON RETURN : _____

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

Equipment Report - TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked / calibrated* as follows:

pH	☑ pH 6.88	☐ pH 7.00	☑ pH 4.00	☐ pH 10.00	☐ pH
Conductivity	☐ 0.0mS/cm	☐ 2.76mS/cm	☑ 12.88mS/cm	☐ 58.6mS/cm	☐ mS/cm
TDS	☐ 0.0 ppk	☑ 36 ppk	☐ ppk		
Dissolved Oxygen	☑ 0.00ppm in Sodium Sulphite			☑ 100% Saturation in Air	
Redox (ORP)**	☑ Electrode operability test 240mV +/- 10%. Actual: 230 mV				
☐ Electrodes cleaned/checked		☐ Charged 8.2 v (min 7.2V)		☐ Temperature	
Turbidity	0.0 NTU☐	90NTU☐	360NTU☐	_____NTU☐	

* Calibration solution traceability information is available upon request.
** This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading. For further information, refer to www.enviroequip.com/quipnotes/ORP.htm.

Date: 14/04/2011 Checked by: P. DANDI.

Signed: P.DANDI

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
☑	☐	☐	90FLMV Unit. Ops check / Battery Voltage @ 8.3
☑	☐	☐	pH sensor 5m
☑	☐	☐	Conductivity / TDS / Temperature k=10 sensor 5m
☑	☐	☐	Dissolved Oxygen YSI5739 sensor 5m
☑	☐	☐	Redox (ORP) sensor 5m
☑	☐	☐	Battery charger: 240V AC to 12V DC 200mA
☑	☐	☐	Instruction Manual
☑	☐	☐	Quick Guide
☑	☐	☐	Syringe with storage solution for pH & ORP sensors
☒	☐	☐	Turbidity 5m
☑	☐	☐	Carry Case

Processors Signature/ Initials MR

EE Quote Reference	24554.	Condition on return
Customer Ref		
Equipment ID	90FLMV WA3	
Equipment serial no.		
Return Date	/ /	
Return Time		

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

EQUIPMENT CERTIFICATION REPORT

Sample Pro Micro Purge Low-Flow Bladder Sampling Pump

This Pump has been checked as follows:

Cleaned / checked ☑ Description - MPKITO - - Clean and check all components

Date: 15th April 2011.

Checked by: PETER H

Signature:

Please check that the following items are received and all items are returned. Please clean equipment before returning. **A minimum $20 service/repair charge applies to any unclean or damaged items.**

Sent	Received	Returned	Description
☑	☐	☐	QED Sample MicroPurge Pump Serial No: 11337
☑	☐	☐	Pump Operating Field Guide laminated
☑	☐	☐	Pump Controller ID: QMP10 0 Batt Status 4.15v
☑	☐	☐	Pump Controller Blue Airline Hose
☑	☐	☐	Blue Airline Hose **Quick Connect Fitting** for ¼" Airline
☑	☐	☐	Pump Tube & Cap
☑	☐	☐	Hanger Cable S/steel, length 65 m
☑	☐	☐	Hanger Cable Clamp – Black with Orange Tip
☑	☐	☐	Controller Instructions inside case
☑	☐	☐	Compressor ID: TA4101F -
☑	☐	☐	Comp connecting Hose & Push lock fittings
☐	☒	☐	Gas Bottle CO2 ID: _____
☐	☒	☐	CO2D Gas Regulator ID: _____ in Carry Case
☐	☒	☐	CO2D Cylinder Gas Regulator Shift Spanner
☐	☒	☐	Gas Bottle Trolley
☐	☒	☐	Cylinder weight… Without Trolley _____ KG
☑	☐	☐	Flow Cell ID: EFC500C With Lid: (Yes) No
☑	☐	☐	Spare Disposable Bladders, qty 2
☑	☐	☐	Spare balls, Qty 2
☑	☐	☐	Spare o-rings, Qty 2

NA

_____ Processors Signature/ Initials

QUOTE NO.: 24460

ID: QSP6P

CLIENT'S REF:P/O No: _____

CLIENT'S REF:Job No: _____

RETURN DATE: ____/____/____

TIME: _____

CONDITION ON RETURN : _____

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

EQUIPMENT CERTIFICATION REPORT

Sample Pro Micro Purge Low-Flow Bladder Sampling Pump

This Pump has been checked as follows:

Cleaned / checked ☑ Description Micro Purge Kit

Clean and check all components

Date: 15-04-2011

Checked by: Jon

Signature:

Please check that the following items are received and all items are returned. Please clean equipment before returning. **A minimum $20 service/repair charge applies to any unclean or damaged items.**

Sent	Received	Returned	Description
☑	☐	☐	QED Sample MicroPurge Pump Serial No: 1190
☑	☐	☐	Pump Operating Field Guide laminated
☑	☐	☐	Pump Controller ID: 10 N Batt Status high
☑	☐	☐	Pump Controller Blue Airline Hose
☑	☐	☐	Blue Airline Hose **Quick Connect Fitting** for ¼" Airline
☑	☐	☐	Pump Tube & Cap
☑	☐	☐	Hanger Cable S/steel, length 60 m
☑	☐	☐	Hanger Cable Clamp – Black with Orange Tip
☑	☐	☐	Controller Instructions inside case
☑	☐	☐	Compressor ID: TA 4101
☑	☐	☐	Comp connecting Hose & Push lock fittings
☐	☒	☐	Gas Bottle CO2 ID: _____
☐	☒	☐	CO2D Gas Regulator ID: _____ in Carry Case
☐	☒	☐	CO2D Cylinder Gas Regulator Shift Spanner
☐	☒	☐	Gas Bottle Trolley
☐	☒	☐	Cylinder weight… Without Trolley_____KG_
☑	☐	☐	Flow Cell ID: Ffc500 A With Lid: Yes/No
☑	☐	☐	Spare Disposable Bladders, qty 2
☑	☐	☐	Spare balls, Qty 2
☑	☐	☐	Spare o-rings, Qty 2

NA

_____ Processors Signature/ Initials

QUOTE NO.: 24468

ID: QSP6P

CLIENT'S REF:P/O No: _____

CLIENT'S REF:Job No: _____

RETURN DATE: ____/____/____

TIME: _____

CONDITION ON RETURN : _____

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Equipment Calibration Record – Minirae 3000

This equipment calibration record is to be stored in your job folder

Equipment Type: Rae Systems Minirae 3000 PID

Equipment Number: _____

Date Calibrated: 10 Feb 2011

Calibrated By: Shane Furlong / Vanessa Round (name)

Job Number: 210074

Details of Calibration:

Fresh Air Calibration: 0.0 ppm

* 100 ppm Isobutylene Calibration: 43.5 ppm reading (PID calibration set to this) ppm

Isobutylene Cylinder Expiration Date: _____

Isobutylene Cylinder Lot Number : 77175

Battery Reading: _____ V

Filter Checked (Condition): ✓

* Record the concentration of the calibration standard

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Equipment Calibration Record – TPS

This equipment calibration record is to be stored in your job folder

Equipment Type: TPS Water Quality Meter

Equipment Number: 90 ≠ LMVF

Date Calibrated: 20/4/11

Calibrated By: L. Boland (name)

Job Number: 211074

Details of Calibration:

Electrode Checked (Condition): Good

pH at 4.01 Reading: 4.00

pH at 7.01 Reading (or 6.88): NA

ORP in Redox solution (200-275 mV): 104 (mV)

Temperature: NA °C

Conductivity in 2.76 mS/cm: NA mS/cm

Conductivity in 12.88 mS/cm: 12.00 mS/cm mS/cm

Dissolved Oxygen in 0.00 ppm in Sodium sulfate: NA %

Dissolved Oxygen 100% Air Saturation: NA %

Turbidity in 0 NTU NA

Turbidity in 900 NTU NA

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Equipment Calibration Record – TPS

This equipment calibration record is to be stored in your job folder

Equipment Type: TPS Water Quality Meter

Equipment Number: 90FLMVN (hired from ThermoFisher

Date Calibrated: 20 April 2011

Calibrated By: Katy Kijek (name)

Job Number: 210074

Details of Calibration:

Electrode Checked (Condition): good

pH at 4.01 Reading: 4.05

pH at 7.01 Reading (or 6.88):

ORP in Redox solution (200-275 mV): (mV)

Temperature: 18.0 °C

Conductivity in 2.76 mS/cm: mS/cm

Conductivity in 12.88 mS/cm: mS/cm

Dissolved Oxygen in 0.00 ppm in Sodium sulfate: NA %

Dissolved Oxygen 100% Air Saturation: NA %

Turbidity in 0 NTU NA

Turbidity in 900 NTU NA

APPENDIX G SOUTH EAST WATER 'Standards for Trade Waste Discharge to the Sewer System'

SOUTH EAST WATER

Standards for
Trade Waste
Discharged to the Sewerage System

All the Trade Waste Limits you need to know to discharge trade waste to the sewerage system.

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STANDARDS FOR TRADE WASTE DISCHARGED TO THE SEWERAGE SYSTEM

The nature an□ levels of the characteristics of **trade waste** □ischar□e□ must at all times comply with the stan□ar□s set out in this sche□ule.

1 PHYSICAL CHARACTERISTICS

□.□ Tem□erature

The □**ustomer** must not □ischar□e **trade waste** with a temperature □reater than 38^0 C.

□.2 Solids

The □**ustomer** must not □ischar□e **trade waste** containin□ □ross Soli□s, Suspen□e□ Soli□s or Total Dissolve□ Soli□s except as provi□e□ in para□raphs (a) to (□).

(a) □**ross Solids contained in** tra□e waste **must**□

(i) be able to pass throu□h a bar screen with 13mm spaces between bars□an□

(ii) have a □uiescent settlin□ velocity of not more than 3m□hour.

(b) □ here the total mass loa□ of Suspen□e□ Soli□s exce□s 1,000 □□□□ay, the concentration of Suspen□e□ Soli□s must not exce□ 10,000 m□□□itre.

(c) Except as provi□e□ in para□raph (□), the total mass loa□ of Total Dissolve□ Soli□s must not exce□ 200 □□□□ay.

(□) **The** □**ustomer** must not □ischar□e waste containin□ fibrous material, which, in the opinion of **South East Water** is li□ely to cause obstructions in a □rain or sewer.

□.□ □ils□□ats and grease

(a) **The** □**ustomer** must not □ischar□e **trade waste** containin□ any free or floatin□ layer of oil, fat or □rease.

(b) **The** □**ustomer** may □ischar□e **trade waste** containin□ emulsifie□ oil, fat or □rease which, in the opinion of **South East Water**, is bio□e□ra□able, if the emulsion is stable□

(i) at a temperature of 15^0 C□an□

(ii) when it is in contact with raw sewa□e an□ the resultin□ mixture has a p□ no less than 4.5 an□ no □reater than 10.0.

(c) **The** □**ustomer** must not □ischar□e **trade waste** containin□ emulsifie□ oil, fat or □rease which, in the opinion of **South East Water** is not bio□e□ra□able, it contains more than 1,000 m□□□itre of material recovere□ by a solvent prescribe□ **South East Water** as extractable matter when the emulsion □

(i) is stable at a temperature of 15^0 C□an□

(ii) is in contact with raw sewa□e an□ the resultin□ mixture has a p□ no less than 4.5 an□ no □reater than 10.0.

(□) **The** □**ustomer** must not □ischar□e tra□e waste containin□ emulsifie□ oil, fat or □rease if it contains more than 200 m□□□itre of material recoverable by a solvent prescribe□ by **South East Water** as extractable matter when the emulsion is□

(i) unstable at a temperature of 15°C□an□

(ii) in contact with raw sewa□e an□ the resultin□ mixture has a p□ no less than 4.5 an□ no □reater than 10.0.

□.4 □rganic Li□uids

(a) **The □ustomer** must not □ischar□e **trade waste** containin□ any free or floatin□ layer of or□anic li□ui□.

(b) **The □ustomer** must not □ischar□e any **trade waste**, which, in the opinion **South East Water**, may be flammable.

□.□ Late□ Emulsions

(a) In this clause □

□□iodegrada□le□ in relation to **trade waste** means that, in the opinion **South East Water**, the total or□anic carbon content of the **trade waste** woul□ □ecrease by at least 90□ when submitte□ to the sewa□e treatment process employe□ by the Company for that waste□

□late□ emulsion□ inclu□es an emulsion containin□ paint, a□hesive, rubber, plastic or similar materials.

□sta□le late□ emulsion□ means a latex emulsion in which the soli□s □eposite□ in a filter □o not increase by more than 200 m□□itre when the emulsion □

(i) is at 15^0 C□an□

(ii) is in contact with raw sewa□e an□ the resultin□ mixture has p□ no less than 4.5 an□ no □reater than 10.0.

(b) **The □ustomer** may □ischar□e **trade waste** containin□ a bio□e□ra□able stable latex emulsion.

(c) **The □ustomer** must not □ischar□e **trade waste** containin□ a stable latex emulsion, which is not bio□e□ra□able at a concentration □reater than 1,000 m□□itre of total soli□s.

(□) **The □ustomer** must not □ischar□e **trade waste** containin□ an unstable latex emulsion.

□.□ □adioacti□e waste

The □ustomer must only □ischar□e **trade waste** which complies in all respects with the □ealth (□a□iation Safety) □e□ulations 1984, as amen□e□ from time to time.

□.□ □olour

The □ustomer must not □ischar□e **trade waste** containin□ Colour □reater than 9 A□ams□ Nic□erson (42) units, □etermine□ from the most pronounce□ Colour obtaine□ from a sample a□uste□ to a p□ of not less than 7.0 an□ no □reater an□ than 8.0 followin□ biolo□ical treatment by an activate□ slu□□e process.

2 CHEMICAL CHARACTERISTICS

2.□ □□ □alue

The □ustomer must not □ischar□e **trade waste** with a p□ value less than 6.0 or □reater than 10.0, except as provi□e□ by clause 2.3 (b) (ii).

2.2 □rganic □oncentration

The □ustomer must not □ischar□e **trade waste** with a total mass loa□ of 5□□ay biochemical oxy□en □eman□ in excess of 1,000 □□□□ay, unless its concentration is no □reater than 4,000 m□□□itre.

2.□ □itrogen

The □ustomer must not □ischar□e **trade waste** with a concentration of□

(a) Total □□el□ahl Nitro□en □reater than 500 m□□□itre□or

(b) Ammonia, plus ammoniacal ion (expresse□ as N) □reater than:

(i) 50 m□□□itre, except as provi□e□ by this para□raph.
(ii) 200m□□litre, where □
(A) the **trade waste** □ischar□e□ can only be receive□ by Melbourne □ ater□s □ estern Treatment Plant□
(B) a ris□ assessment has been con□ucte□□
(C) **the customer** can comply with a restricte□ p□ ran□e of 6.0 to 8.0□ an□
(D) **the customer** has □emonstrate□ to **South East Water**, that commonly available waste minimi□ation technolo□y has been applie□ to the best extent practicable.

2.4 Sul□ur Su□stances

(a) □□**idised Sul□ur**

(i) For the purpose of this para□raph, □□ □**idised Sul□ur**□means the chemical substances expresse□ as S an□ □nown as Sulfates, Sulfites an□ Thiosulfates.

(ii) **The □ustomer** must not □ischar□e **trade waste** containin□ Oxi□ise□ Sulfur with a concentration of 100 m□□□itre or more, except as provi□e□ in this para□raph.

(iii) **The □ustomer** must treat any **trade waste** with a concentration of Oxi□ise□ Sulfur □reater than 600 m□□□itre, before it is □ischar□e□.

(iv) □ here **trade waste** prior to □ischar□e woul□ have a total concentration of Oxi□ise□ Sulfur of not less than 100 m□□□itre an□ not more than 600 m□□□itre, the □**ustomer** must treat any stream of waste contributin□ to the □ischar□e which has a concentration of Oxi□ise□ Sulfur □reater than 600 m□□□itre.

(v) **The □ustomer** must use the best available technolo□y, as □etermine□ by **South East Water**, to treat any **trade waste** un□er sub□para□raph (iii) or (iv).

(b) **The □ustomer** must not □ischar□e **trade waste** containin□ Sulfi□e in a concentration □reater than 1 m□□□itre.

2.□ Metals

(a) **The □ustomer** must not □ischar□e any element liste□ in Column 1 of Table A, except in accor□ance with this sub□clause 2.5.

(b) □ here the □aily mass loa□ of any element □ischar□e□ is between the lower limit specifie□ in Column 2 an□ the upper limit specifie□ in Column 3 for that element, **trade waste** must not excee□ the concentration specifie□ in Column 4.

(c) □ here the □aily mass loa□s of any element □ischar□e□ is either lower than the limit specifie□ in Column 2 or □reater than the limit specifie□ in Column 3, **South East Water** must □etermine the maximum concentration of that element which the □**ustomer** may □ischar□e.

(□) □ here no entry is ma□e in Column 2 an□ 3 for any element, **trade waste** must not excee□ the concentration for that element specifie□ in Column 4.

(e) □ here the □**ustomer** has □emonstrate□ to **South East Water**, that it is unable to limit the concentration of Boron (as B) to the concentration specifie□ in Table A, Column 4 usin□ commonly available waste minimi□ation technolo□y to the best extent practicable, the □**ustomer** may □ischar□e **trade waste** containin□ Boron in a concentration no □reater than 100 m□□itre.

(f) □ here the □**ustomer** has □emonstrate□ to **South East Water**, that it is unable to limit the concentration of Man□anese (as Mn) to the concentration specifie□ in Table A, Column 4 usin□ commonly available waste minimi□ation technolo□y to the best extent practicable, the □**ustomer** may □ischar□e **trade waste** containin□ Man□anese in a concentration no □reater than 100 m□□itre.

Table A

□**olumn** □ **Element**	□**olumn 2** **grams□day**	□**olumn** □ **grams□day**	□**olumn 4** **mg□L**
Arsenic			1
Boron as B			25
Barium			150
Beryllium			30
Ca□mium	0.4	20	2
Chromium	100	5000	10
Cobalt			10
Copper	100	5000	10
Iron	2000	100000	100
□ea□	100	5000	10
Man□anese			10
Mercury	0.2	10	1
Molyb□enum			10
Nic□el	10	500	10
Selenium			10
Silver[1]	0.2	50	5
Thallium			20
Tin			10
□ranium (238)			30
□inc	200	15000	10

[1] base□ on analysis usin□ □i□estion with a□ua re□ia.

2.□ □alogens and □alides

The □ustomer must not □ischar□e **trade waste** containin□ a substance liste□ in Table B with a concentration □reater than is liste□ for that substance.

Table B

Substances	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Bromine (expresse□ as Br_2)	5
Chlorine (expresse□ as Cl_2	5
Fluori□e	30
Io□ine (expresse□ I_2) in	5

2.□ □yanide

The □ustomer must not □ischar□e **trade waste** containin□ a cyani□e concentration □reater than 10 m□□itre.

2.□ Inhi□itory □hemicals

(a) **The □ustomer** must not □ischar□e any **trade waste** which, when □ilute□ to a 5 □ solution with sewa□e, woul□ inhibit the microbiolo□ical sewa□e treatment process applicable to that **trade waste** by more than 20□ .

(b) **South East Water** must □etermine the microbiolo□ical sewa□e treatment process referre□ to in sub□para□raph (a).

2.□ □rganic Acids

The □ustomer must not □ischar□e **trade waste** containin□ total phenoxyacetic aci□s an□ chemical □erivatives (expresse□ as phenoxyacetic aci□) at a concentration □reater than 1,000 m□□itre.

2.□0 □henolic Su□stances

The □ustomer must not □ischar□e **trade waste** containin□ a substance liste□ in Table C with a concentration □reater than is liste□ for that substance.

Table C

Substances	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Sum of phenol, monochlorophenol, □ichlorophenol an□ their isomers	300
Trichlorophenol	50
Tetrachlorophenols	5
Pentachlorophenol	5

2.□□ Aldehydes and □etones

The □ustomer must not □ischar□e **trade waste** containin□ a substance liste□ in Table D with a concentration □reater than is liste□ for that substance.

Table D

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Acetone	50
Acrolein	0.1
Formal□ehy□e (expresse□ as □C□O)	200

2.□2 □itriles

The □ustomer must not □ischar□e **trade waste** containin□ acrylonitrile at a concentration □reater than 1.0 m□□itre.

2.□□ Mononuclear Aromatic □ydrocar□ons

The □ustomer must not □ischar□e **trade waste** containin□ a mononuclear aromatic hy□rocarbon liste□ in Table E in a concentration □reater than is liste□ for the substance.

Table E

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Ben□ene	1.0
Cumene	3.0
2,4 Dinitrotoluene	10.0
2, 6 Dinitrotoluene	10.0
Ethylben□ene	2.0
Nitrotoluene	5.0
Styrene	2.0
Toluene	2.0
Total Xylenes	2.0

2.□4 □alogenated Ali□hatic □ydrocar□ons

The □ustomer must not □ischar□e **trade waste** containin□ a halo□enate□ aliphatic hy□rocarbon liste□ in Table F in a concentration □reater than is liste□ for that substance.

Table F

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
1,2 Dichloroethane	5.0
1,1,1 Trichloroethane	3.0
1,1,2 Trichloroethane	3.0
1,1,2,2 Tetrachloroethane	2.0
□exachloroethane	1.0
Chloromethane (Vinyl Chlori□e Monomer)	0.5
1,2 Dichloroethylene	5.0
Trichloroethylene	1.0
Tetrachloroethylene	1.0
Carbon Tetrachlori□e	1.0
Methylene Chlori□e	5.0
Methyl Chlori□e	1.0 □□□□
Methyl Bromi□e	1.0 □□□□
Trichloromethane (Chloroform)	1.0
Bromo□ichloromethane	1.0
Trichlorofluoromethane	1.0
Dichloro□ifluoromethane	1.0
Chloro□ibromomethane	5.0
1,1 Dichloropropane	5.0
1,2 Dichloropropane	5.0
1,3 Dicloropropane	1.0 □□□□
□exachlorobuta□iene	1.0 □□□□

2.□□ Ali□hatic □ydrocar□ons

The □ustomer must not □ischar□e **trade waste** containin□ aliphatic hy□rocarbons C6 to C9 at a concentration □reater than 1.0 m□□itre. □□**ote:** □□ □ □ □□□**shown in section 2.□□ o□ Schedule 4 o□the Water and Sewerage Licence is an error□.**

2.□□ Esters

The □ustomer must not □ischar□e **trade waste** containin□ a substance liste□ in Table □ in a concentration □reater than is liste□ for that substance.

Table G

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Ethyl Acrylate	1.5
Methyl Methacrylate	30.0

2.□□ Ethers

The □ustomer must not □ischar□e **trade waste** containin□ □iethylene □lycol monobutyl ether (butyl carbitol) in a concentration □reater than 2,000 m□□itre.

2.□□ □ther □rganics

The □ustomer must not □ischar□e **trade waste** containin□ a substance liste□ in Table □ with a concentration □reater than is liste□ for that substance.

Table H

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
□lyphosate	10
Trifluralin	10
Epichlorohy□rin	0.3

2.□□ □ersistent □rganochlorine □esticides

(a) **The □ustomer** must not □ischar□e **trade waste** containin□ persistent or□anochlorine pestici□es, except in accor□ance with this para□raph.

(b) **The □ustomer** must not □ischar□e **trade waste** containin□ pestici□es liste□ in Table I in a concentration □reater than is liste□ for that pestici□e.

Table I

□esticide	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Al□rin	0.001
Chlor□ane	0.006
DDT	0.003
Diel□rin	0.001
□eptachlor	0.003
□in□ane	0.100

2.20 □alogenated Aromatic □ydrocar□ons

(a) **The □ustomer** must not □ischar□e **trade waste** containin□ halo□enate□ aromatic hy□rocarbons, except in accor□ance with this para□raph.

(b) **The □ustomer** must not □ischar□e **trade waste** containin□ a substance liste□ in Table □ in a concentration □reater than is liste□ for that substance.

Table J

Su□stance	**Ma□imum Allowa□le □oncentration Milligrams □er Litre**
Polychlorinate□ Biphenyls (PCB□s)	0.002
Polybrominate□ Biphenyls (PBB□s)	0.002

2.2□ □hlorodi□en□o□□dio□ins and □hlorodi□en□o□urans

(a) **The □ustomer** must not □ischar□e any **trade waste** containin□ any of the full ran□e of chloro□iben□o□p□□ioxin an□ chloro□iben□o□furan co□eners, except in accor□ance with this para□raph.

(b) Sub□ect to sub□para□raphs (c), (□) an□ (e), **the □ustomer** must not □ischar□e **trade waste** containin□ any of the full ran□e of chloro□iben□o□p□□ioxin an□ chloro□iben□o□ furan con□eners in a concentration □reater than the NATO total toxic e□uivalent of 40.0 n□□□.

(c) Notwithstan□in□ sub□para□raph (b), **South East Water** may at any time in writin□ re□uire **the □ustomer** not to □ischar□e any **trade waste** containin□ any of the full ran□e of chloro□iben□o□p□□ioxin an□ chloro□iben□o□furan con□eners in a concentration □reater than the NATO total toxic e□uivalent of 20.0 n□□□.

(□) Sub□ect to sub□para□raph (e), **the □ustomer** must not □ischar□e **trade waste** containin□ any 2,3,7 or 8 tetrachloro□iben□o□p□□ioxin con□eners in a concentration □reater than the NATO toxic e□uivalent of 20.0 n□□□.

(e) Notwithstan□in□ sub□para□raph (□), **South East Water** may at any time re□uire **the □ustomer** not to □ischar□e any 2,3,7,8 tetrachloro□iben□o□p□□ioxin con□eners in a concentration □reater than the NATO total toxic e□uivalent of 5.0 n□□□.

2.22 □eads□ace Air

The □ustomer must not □ischar□e **trade waste** to a sewer, which at the nearest point of the sewer accessible by humans from the point of □ischar□e, in any respect fails to comply with every relevant □ or□ Safe Australia Exposure Stan□ar□ relatin□ to short□term exposure levels.

2.2□ □ther Su□stances

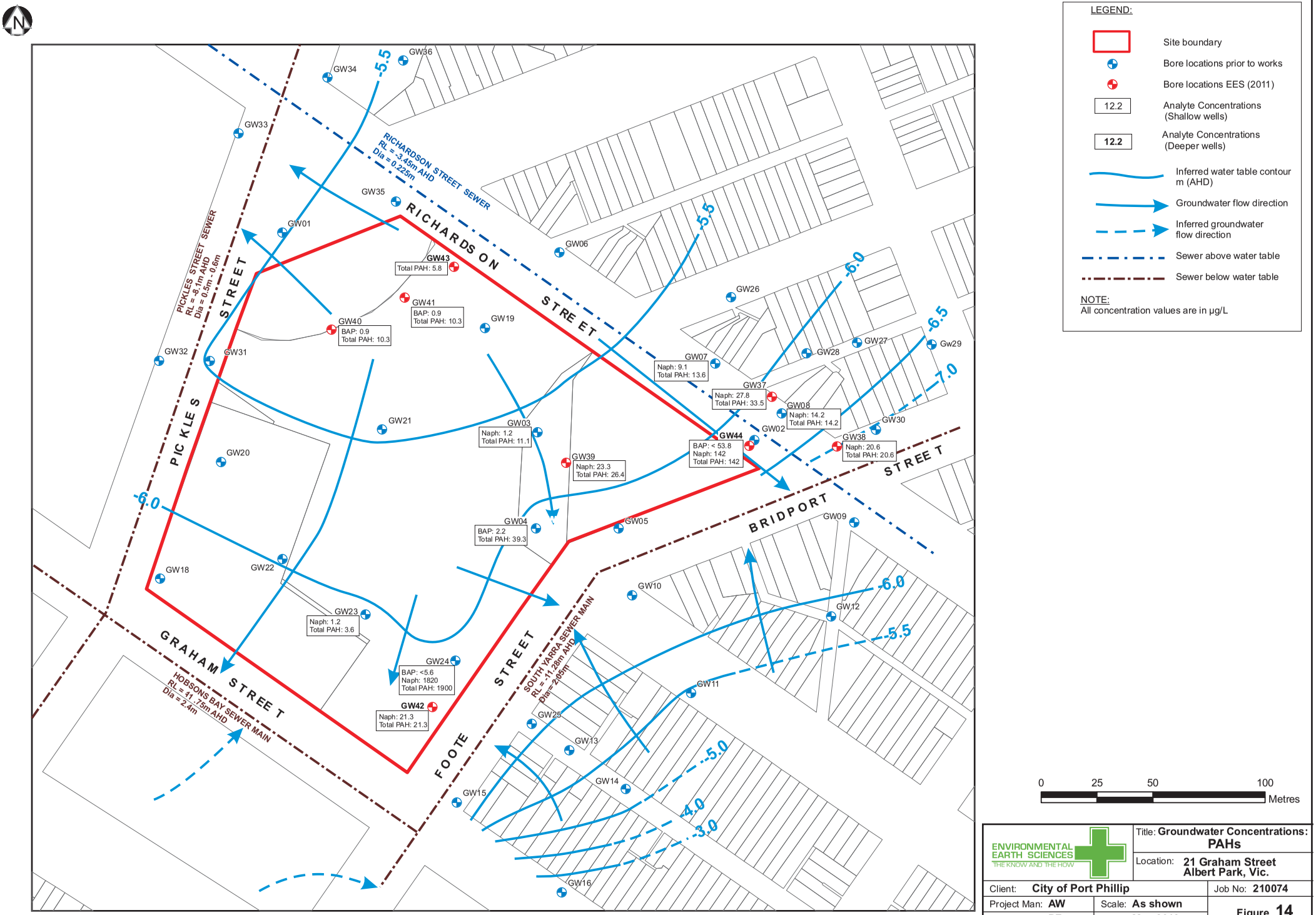
A □ustomer must not □ischar□e **trade waste** containin□ any substance not otherwise mentione□ in this Sche□ule:

(a) in a concentration no □reater than 1 □□□□an□

(b) where the □ischar□e or release of which to any element of the environment is restricte□ or prohibite□ by any le□islation applyin□ in Victoria□an□

(c) in □uantities or of a □uality that in the opinion of **South East Water** woul□ or is reasonably li□ely to en□an□er human life, compromise the safety of a person or of the wor□s, or si□nificantly a□versely affect the operation of a sewa□e treatment plant or any part of the environment.□

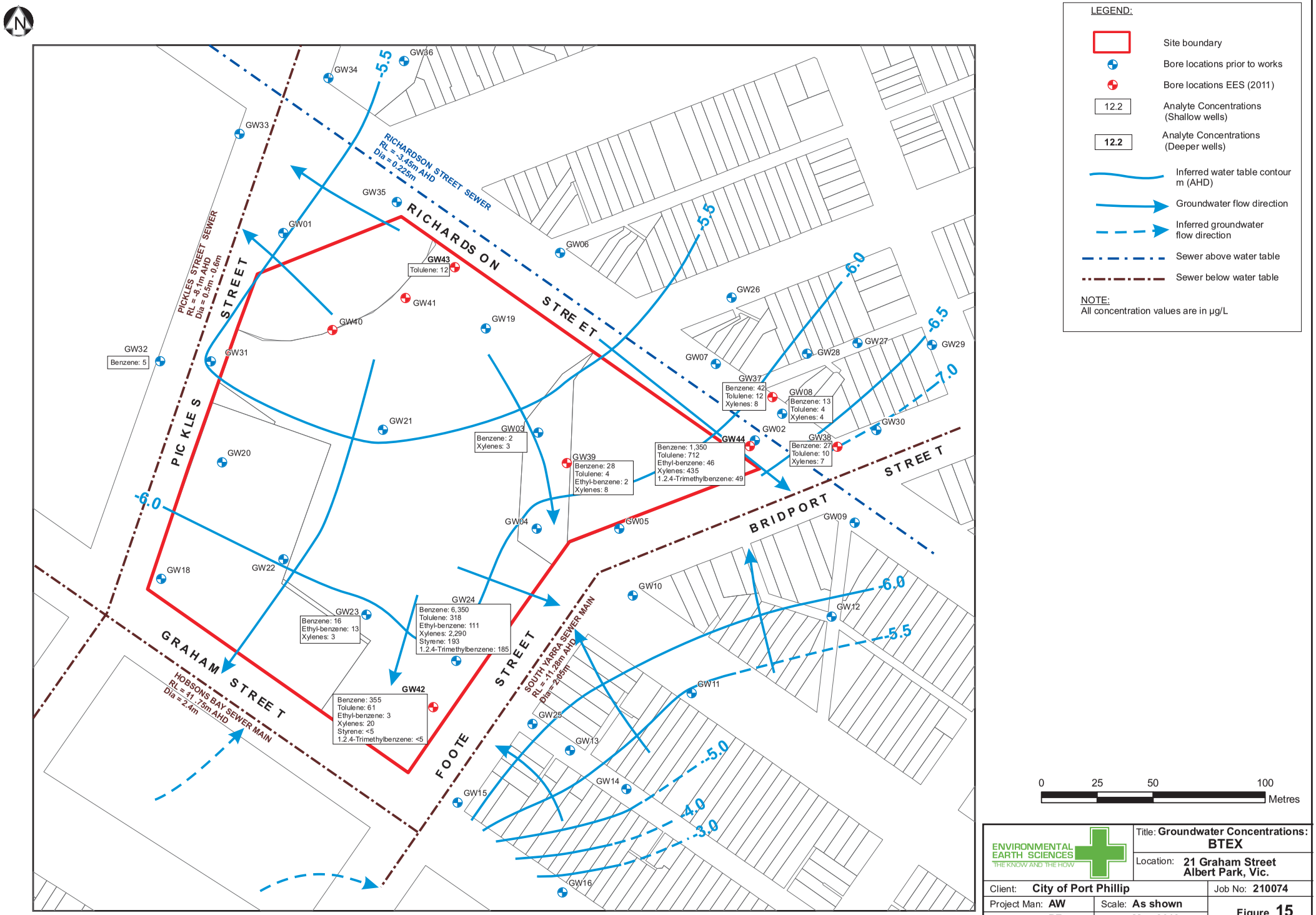
APPENDIX H SUPPLEMENTAL FIGURES ILLUSTRATING CONCENTRATIONS OF SELECT ANALYTES

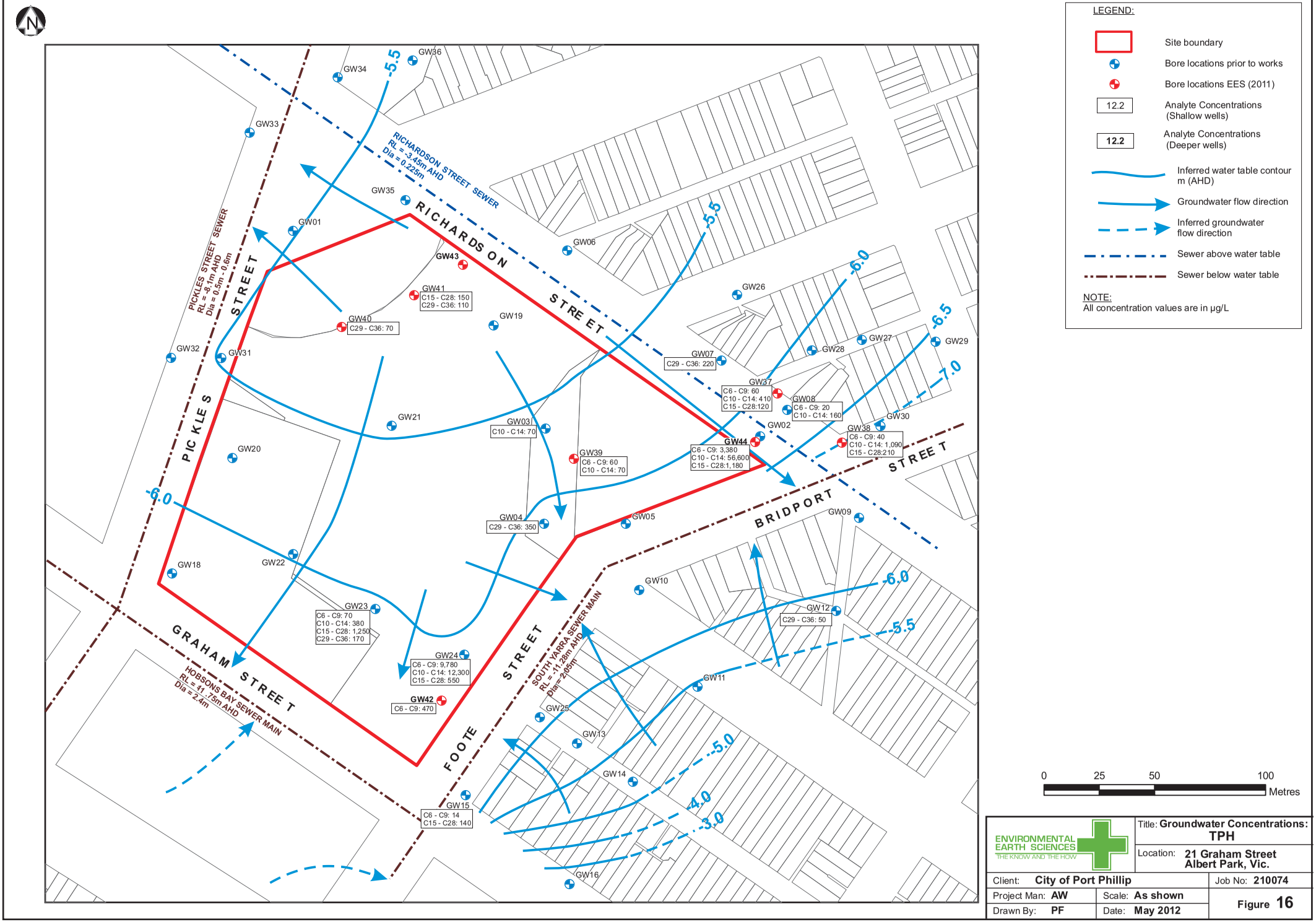


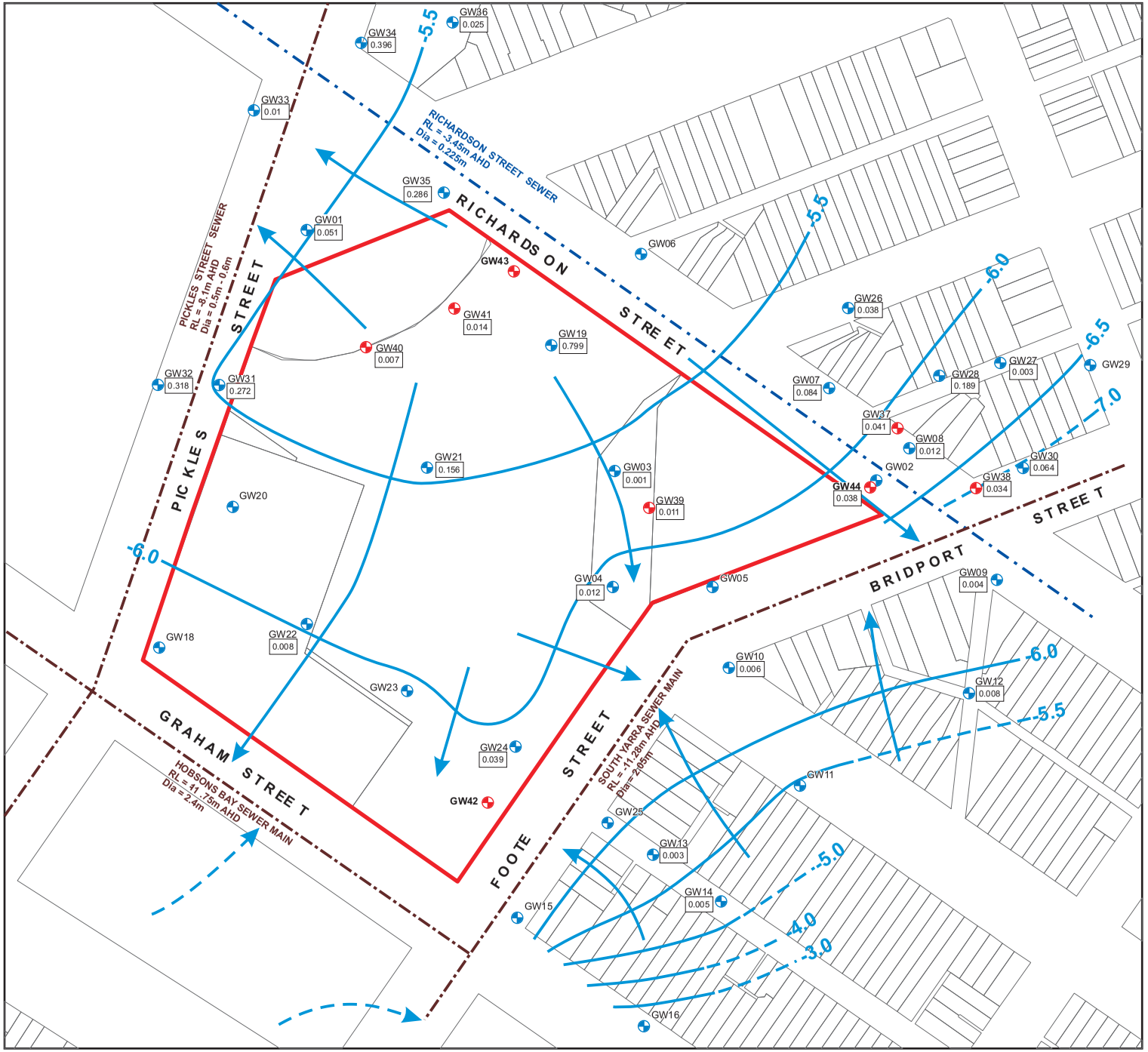
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Groundwater Concentrations: PAHs**
Location:	**21 Graham Street Albert Park, Vic.**
Client:	**City of Port Phillip**
Job No:	**210074**
Project Man:	**AW**
Scale:	**As shown**
Drawn By:	**PF**
Date:	**May 2012**

Figure 14


LEGEND:
Site boundary
Bore locations prior to works
Bore locations EES (2011)
12.2
Analyte Concentrations (Shallow wells)
12.2
Analyte Concentrations (Deeper wells)
Inferred water table contour m (AHD)
Groundwater flow direction
Inferred groundwater flow direction
Sewer above water table
Sewer below water table
NOTE:
All concentration values are in µg/L
RICHARDSON STREET SEWER
RL = -3.45m AHD
Dia = 0.225m
PICKLES STREET SEWER
RL = -8.1m AHD
Dia = 0.5m - 0.6m
HOBSONS BAY SEWER MAIN
RL = -11.75m AHD
Dia = 2.4m
SOUTH YARRA SEWER MAIN
RL = -11.28m AHD
Dia = 2.05m
RICHARDSON STREET
PICKLES STREET
GRAHAM STREET
FOOTE STREET
BRIDPORT STREET
GW01
GW02
GW03
Benzene: 2
Xylenes: 3
GW04
GW05
GW06
GW07
GW08
Benzene: 13
Tolulene: 4
Xylenes: 4
GW09
GW10
GW11
GW12
GW13
GW14
GW15
GW16
GW18
GW19
GW20
GW21
GW22
GW23
Benzene: 16
Ethyl-benzene: 13
Xylenes: 3
GW24
Benzene: 6,350
Tolulene: 318
Ethyl-benzene: 111
Xylenes: 2,290
Styrene: 193
1.2.4-Trimethylbenzene: 185
GW25
GW26
GW27
GW28
GW29
GW30
GW31
GW32
Benzene: 5
GW33
GW34
GW35
GW36
GW37
Benzene: 42
Tolulene: 12
Xylenes: 8
GW38
Benzene: 27
Tolulene: 10
Xylenes: 7
GW39
Benzene: 28
Tolulene: 4
Ethyl-benzene: 2
Xylenes: 8
GW40
GW41
GW42
Benzene: 355
Tolulene: 61
Ethyl-benzene: 3
Xylenes: 20
Styrene: <5
1.2.4-Trimethylbenzene: <5
GW43
Tolulene: 12
GW44
Benzene: 1,350
Tolulene: 712
Ethyl-benzene: 46
Xylenes: 435
1.2.4-Trimethylbenzene: 49
-5.5
-6.0
-6.5
-7.0
-5.0
-4.0
-3.0
0
25
50
100
Metres
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW
Title: Groundwater Concentrations: BTEX
Location: 21 Graham Street Albert Park, Vic.
Client: City of Port Phillip
Job No: 210074
Project Man: AW
Scale: As shown
Drawn By: PF
Date: May 2012
Figure 15


LEGEND:
Site boundary
Bore locations prior to works
Bore locations EES (2011)
12.2
Analyte Concentrations (Shallow wells)
12.2
Analyte Concentrations (Deeper wells)
Inferred water table contour m (AHD)
Groundwater flow direction
Inferred groundwater flow direction
Sewer above water table
Sewer below water table
NOTE:
All concentration values are in µg/L
RICHARDSON STREET SEWER
RL = -3.45m AHD
Dia = 0.225m
PICKLES STREET SEWER
RL = -8.1m AHD
Dia = 0.5m - 0.6m
SOUTH YARRA SEWER MAIN
RL = -11.28m AHD
Dia = 2.05m
HOBSONS BAY SEWER MAIN
RL = -11.75m AHD
Dia = 2.4m
RICHARDSON STREET
PICKLES STREET
GRAHAM STREET
FOOTE STREET
BRIDPORT STREET
GW01
GW02
GW03
C10 - C14: 70
GW04
C29 - C36: 350
GW05
GW06
GW07
C29 - C36: 220
GW08
C6 - C9: 20
C10 - C14: 160
GW09
GW10
GW11
GW12
C29 - C36: 50
GW13
GW14
GW15
C6 - C9: 14
C15 - C28: 140
GW16
GW18
GW19
GW20
GW21
GW22
GW23
C6 - C9: 70
C10 - C14: 380
C15 - C28: 1,250
C29 - C36: 170
GW24
C6 - C9: 9,780
C10 - C14: 12,300
C15 - C28: 550
GW25
GW26
GW27
GW28
GW29
GW30
GW31
GW32
GW33
GW34
GW35
GW36
GW37
C6 - C9: 60
C10 - C14: 410
C15 - C28:120
GW38
C6 - C9: 40
C10 - C14: 1,090
C15 - C28:210
GW39
C6 - C9: 60
C10 - C14: 70
GW40
C29 - C36: 70
GW41
C15 - C28: 150
C29 - C36: 110
GW42
C6 - C9: 470
GW43
GW44
C6 - C9: 3,380
C10 - C14: 56,600
C15 - C28:1,180
-5.5
-6.0
-6.5
-7.0
-5.0
-4.0
-3.0
0
25
50
100
Metres
ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW
Title: Groundwater Concentrations: TPH
Location: 21 Graham Street Albert Park, Vic.
Client: City of Port Phillip
Job No: 210074
Project Man: AW
Scale: As shown
Drawn By: PF
Date: May 2012
Figure 16



LEGEND:

- Site boundary
- Bore locations prior to works
- Bore locations EES (2011)
- 12.2 — Analyte Concentrations (Shallow wells)
- **12.2** — Analyte Concentrations (Deeper wells)
- Inferred water table contour m (AHD)
- Groundwater flow direction
- Inferred groundwater flow direction
- Sewer above water table
- Sewer below water table

NOTE:
All concentration values are in mg/L

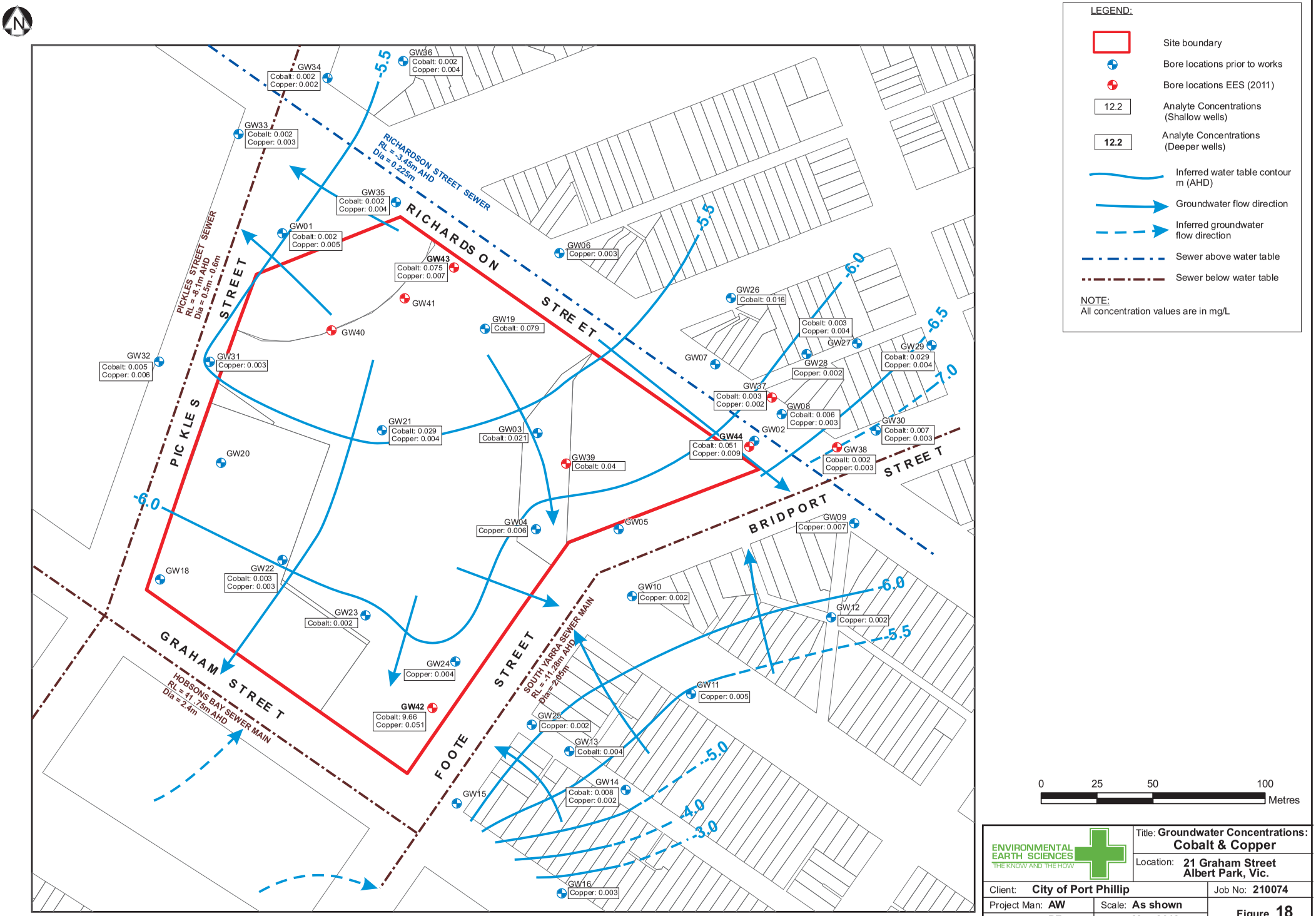
0 25 50 100 Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

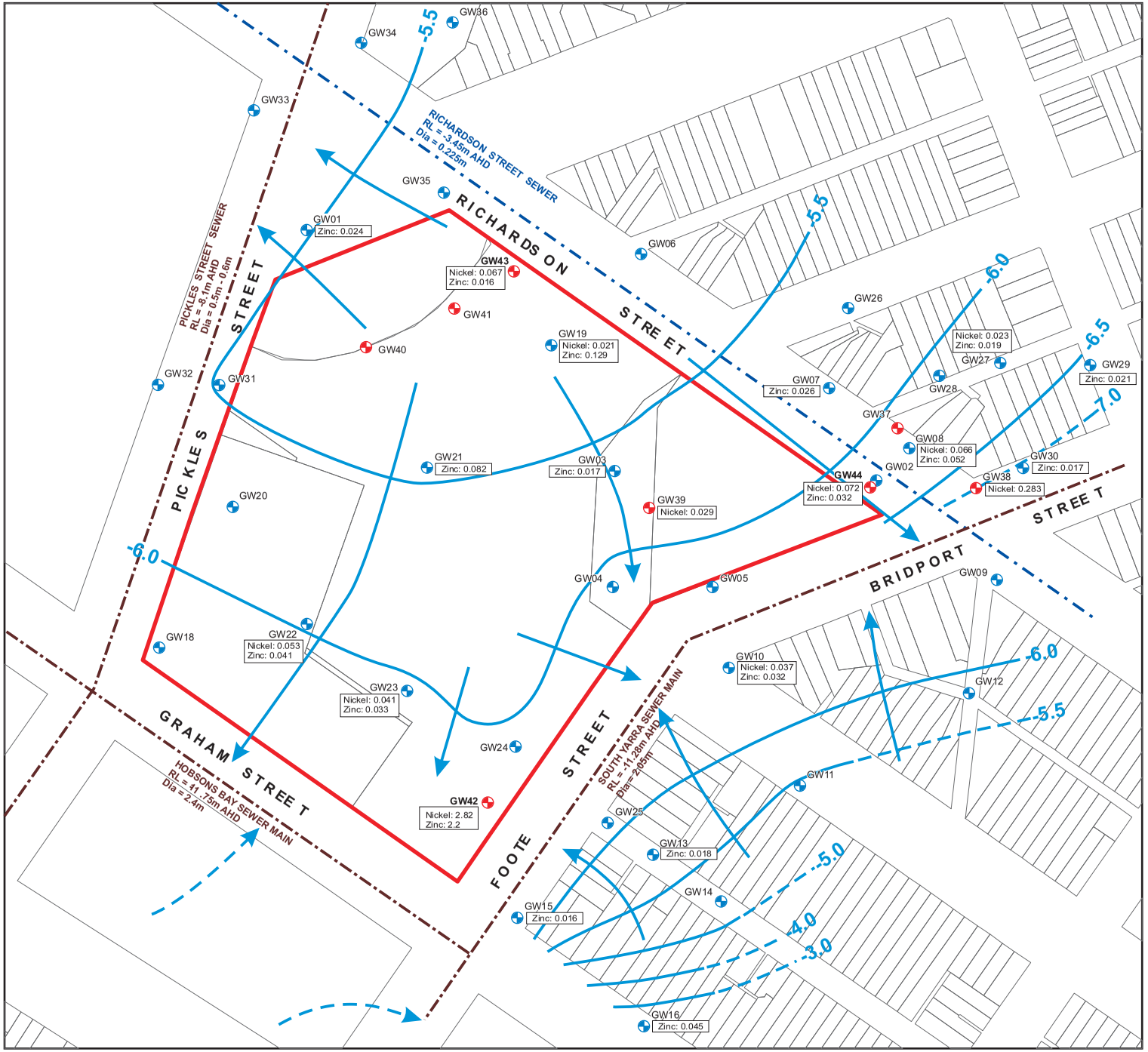
Title: **Groundwater Concentrations: Arsenic**

Location: **21 Graham Street Albert Park, Vic.**

Client: **City of Port Phillip**		Job No: **210074**
Project Man: **AW**	Scale: **As shown**	**Figure 17**
Drawn By: **PF**	Date: **May 2012**	



ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW	Title: **Groundwater Concentrations: Cobalt & Copper**	
	Location: **21 Graham Street Albert Park, Vic.**	
Client: **City of Port Phillip**		Job No: **210074**
Project Man: **AW**	Scale: **As shown**	**Figure 18**
Drawn By: **PF**	Date: **May 2012**	



LEGEND:

- Site boundary
- Bore locations prior to works
- Bore locations EES (2011)
- 12.2 — Analyte Concentrations (Shallow wells)
- 12.2 — Analyte Concentrations (Deeper wells)
- Inferred water table contour m (AHD)
- Groundwater flow direction
- Inferred groundwater flow direction
- Sewer above water table
- Sewer below water table

NOTE:
All concentration values are in mg/L

0 25 50 100 Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title: **Groundwater Concentrations: Nickel & Zinc**

Location: **21 Graham Street Albert Park, Vic.**

Client: **City of Port Phillip**

Job No: **210074**

Project Man: **AW**

Scale: **As shown**

Drawn By: **PF**

Date: **May 2012**

Figure 19

APPENDIX I GROUNDWATER FIELD CHEMISTRY DATA SHEETS

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 9/4/11	Sampled By: KK	Client: City of Port Phillip	Site: GW09

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW09			11:40am	8.82										
			11:55	8.90		1	20.6	6.06	83	3.46	900uS	mod	cloudy	3 rpm
				8.95		2	20.2	5.99	67	3.62	790	"	"	
			12:03	9.02		3	20.4	5.95	60	3.35	758			changed to 2 rpm
				9.10		5	20.7	6.07	56	2.90	761	"	"	
			12:15	9.09		5.5	20.6	6.20	69	2.95	772		~~Sby~~ slightly cloudy	
				9.07		6	20.7	6.40	71	3.85	778	"	"	
				9.08		7	20.6	6.52	74	4.29	783	"	"	
				9.07		7.5	20.8	6.53	74	3.91	781			start sampling

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 200774	Date: 18.4.2011	Sampled By: DT	Client: City of Port Phillip	Site: South Melbourne Gasworks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW34			2:20	7.64		1	21.6	7.37	10	4.20	2.52	No odour	cloudy grey	2 cycles p/min
			2:37	7.70		2.5	20.8	7.59	-11	5.64	2.51	"	"	"
			2:47	7.70		4	20.5	7.63	-29	5.53	2.52	"	"	"
			2:55	7.70 7.70		6	20.5	7.63	-27	5.54	2.55	"	"	"
			3pm	7.70		10	20.6	7.67	-22	5.34	2.56	"	"	SAMPLING.
											4267			
GW29	11.57		3:45	8.49		2	20.0	7.47	14	4.97	2.13	No odour	light brown	3cycles p/m
			4:00	8.53		4	19.7	7.54	22	4.81	2.15	"	"	"
			4:15	8.49		6	19.7	7.54	25	4.98	2.16	"	"	4 cycle p/m
			4:30	8.51		9	19.6	7.56	26	4.97	2.15	"	"	"
			4:40	8.51		11	19.6	7.56	25	4.97	2.16	"	"	" SAMPLING.
											3600			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Pumps in @ 9m BTOC.

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 211074	Date: 18.4.14	Sampled By: CS/DJ	Client: Port Phillip CC	Site: Gasworks Park, Pt. Melb.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW31	10.55		0952	7.10			9.5	6.99	180	1.93	992 ppm		cloudy brown	6 CPM.
			0956	7.26			19.7	7.31	-5	0.24	1.26 ppk			Reduced to 2L - due to drawdown
			1003	7.26			19.8	7.30	-5	0.20	1053 ppk	none		
			1009	7.27		≈20L	19.8	7.26	-4	0.10	912 ppm	none		
			1012	7.27		≈22L	19.8	7.23	-7	0.2	885 ppm			
			1018	7.31		≈27L	19.8	7.20	-10	0.23	882 ppm			
			1024	7.35		≈30L	19.8	7.18	-41	0.3	1189			
			1030	7.38		≈32L	20.0	7.03	-30	0.24	985	none		
			1034	7.40		≈34	19.9	6.97	-22	0.2	948			Stopped & waited for recharge
			1039	7.42		≈38	19.7	6.99	-6	0.16	1017			
			10:43	7.42		≈40	19.6	6.97	-1	0.21	1058			
			10:48	7.43		≈42	19.5	7.03	3	0.29	1219			Sampled at 10:50
			1108				19.3	7.09	4	0.35	1214			After sampling.
											2158			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Pump @ 1m above total depth.

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 211074 | Date: 18/4/11 | Sampled By: LB | Client: Port Phillip C.C | Site: Coalworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW33	10.29		1225	7.22		2L	20.2	6.94	98	4.23	7.12ppk	none	cloudy Brown	Reds silty @ bottom of well
			1230	7.32		4L	19.7	7.22	68	6.20	5.64	—	" — "	4 CPM – Good recharge
			1235	7.33		6L	19.6	7.27	73	7.09	3.72	—	" — "	
			1240	7.33		8L	19.6	7.27	76	6.82	3.44	" — "	" — "	
			1245	7.32		10L	19.6	7.27	77	6.87	3.50			
			1250	7.32		12L	19.5	7.27	75	6.70	3.60			
			1255	7.32		16L	19.5	7.27	70	6.70	3.66	6100		Sampled @ 1255
GW69	9.68		1400	6.8		2L	20.6	6.94	92mV	4.61	1282ppm	earthy	Cloudy Brown	
			1405	6.9		6L	20.4	6.94	89	4.61	1247			
			1410	6.8		10L	20.0	6.97	91	3.85	1220			
			1415			14L	20.0	6.97	92	3.61	1199			
			1420			76L	20.0	6.97	93	339	1167			
											1945			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 18 APRIL 2011 | Sampled By: AS | Client: City of Port Phillip | Site: South Melbourne Gasworks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW35	10.17m		12:35	6.86m										insert pump set 6.87m 2 cycles p/min.
			"	6.95		0.5	22.3	7.09	-33	3.22	11.66	No odour	turbid (brown)	"
			12:45	6.94		1.0	20.8	7.10	-40	3.24	12.17	No odour	"	"
			12:51	6.94		2.0	20.2	7.17	-40	3.85	9.90	No odour	"	"
			1pm	6.94		4	20.0	7.20	-49	3.24	6.81	No odour	"	"
			1.19pm	6.95		6	19.9	7.27	-60	3.39	6.50	"	"	"
			1.24pm	6.94		10	19.9	7.27	-70	3.70	7.21	"	"	"
											1206			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PT = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 20074 | Date: 18-4-2011 | Sampled By: DJones | Client: CoPP (City of Port Phillip) | Site: SMG (South Melbourne Gas works)

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW1			10:50	7.46		0								
			11AM	7.46		0.5	20.4	6.94	129	1.91	2.94	no odour	Light brown	2 cycles a min
			11:10	7.56		1.5	20.2	6.97	97	1.24	3.13	"	"	reduced to 1 cycle
			11:20	7.66		2.5	21.7	6.99	72	1.09	3.00	"	"	"
			11:30	7.66		3.5	21.4	7.01	74	1.77	2.99	"	"	"
			11:40	7.71		4.5	21.1	7.02	74	1.87	2.83	"	"	stopped purging allowed to recharge
			11:50	7.61		6.5	21.2	7.01	74	1.86	2.89	"	"	sampling
											48%			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Dup #2 & split 2 = GW28

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 211074	Date: 19.4.11	Sampled By: LB	Client: Port Phillip C.C.	Site: Gasworks park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm⁻¹	Odour	Colour	Comments
GW28	10.30		1400	7.93		1L	20.8	7.96	-93	4.54	1215ppm	None	clear	Good Recharge.
Dup2/split2			1415	8.00		2L	19.9	7.89	-105	4.83	1210ppm	"	"	6CPM
			1420			5L	19.8	7.84	-109	4.67	1214			
			1425			8L	19.8	7.74	-111	4.76	1221			
Rinsate 2		NA 1600									2035			
GW27	(20/4/11) 10.33		0800	8.22		1L	18.9	7.17	57	3.26	3.49ppk	none	clear	2cpm.
			0810	8.32		8L	18.7	7.22	26	2.97	3.49	None		
			0815	8.34		10L	18.7	7.26	16	3.49	3.56	"	"	
			0820	8.34		14L	18.6	7.29	11	3.67	3.49	5817		Sampled @ 0825
20/4/11 GW36	10.41		0945	7.21		1L	16.9	7.38	130	3.8	1.34ppk	none	clear/cloudy	4 cpm -
			0955	7.38		8L	18.0	6.85	142	3.69	136ppk			
			1000	7.39		12L	18.1	6.90	129	3.42	1.81			
			1005	7.42		18L	18.1	6.98	115	3.44	2.76			Wait for recharge due to SWL Drop
			1005	7.39		22L	18.1	7.03	104	3.35	3.09			
			1010	3.42		26L	18.1	7.08	98	3.24	3.20			
			1015	3.41		28L	18.1	7.10	93	3.27	3.27	5450		Sampled at 1015

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 211074 Date: 20.4.11 Sampled By: AB Client: Port Philip CC Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW39	10.56		1620	8.15		5	18.1	6.67	-77	0.93	3.64	hydrocarb organic	Dark dowdy grey	
			1625	8.13		10	18.1	6.68	-75	0.73	2.25	" "	" "	
			1630	8.36		15	18.1	6.69	-78	0.58	2.30			
			1635	8.35		20	18.1	6.70	-85	0.48	2.25			Purge water has hydrocarbon sheen @surface
			1640	8.34		25	18.1	6.71	-90	0.41	2.25			Sampled at 1640.
											3.79			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 211074 | Date: 20.4.11 | Sampled By: LB | Client: Port Phillip C.G | Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW2	8.81		1120	8.17		Could not sample - not enough H_2O column								Water smells like organics - very sandy
GW440	17.67		1150	8.87		1	17.5	6.18	37	3.43	7.33 ppk	strong Organic	Dark grey/purple - very dark - no sediment	
			1200	8.95		4	18.3	6.55	19	2.42	7.62	" "		Some frothing in purge water
			1210	8.96		15	18.6	6.81	16	2.22	7.82	" "		6cpm
			1215	8.97		25	18.6	6.68	13	2.02	7.43			very strong odour.
			1220	8.		35	18.6	6.59	9	0.09	12383			Sample turned yellow when added to sample containes with HCl, acid.
														- hard to fill bottles w/o air in sample, due to froth
GW5	8.90		1400	8.10		Not enough water column to sample								
GW15	12.57		1435	9.10		~~1769~~ 1	17.9	5.44	203	4.17	359 ppm	none	cloudy orange/brown	6cpm
			1440	9.10		5	18.2	5.47	213	2.46	345			
			1445	9.10		10	18.1	5.59	205	1.92	333			
			1450	9.11		15	18.1	5.74	197	2.07	332 = 553 µs/cm			Sample collected at 1455

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
Pl = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Courier
eskey: 6613 Hydrotherm: 6617

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 21007 4 Date: 2/5/11 Sampled By: JI Client: Site: GASWORKS

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW26			3:15	8.52		0.5	21.5	5.82	612	4.14	3.55	none	creamy brown	CPM4 120L
			3.20	7.58		1.5	21.8	6.07	571	0.74	3.58	none	"	"
			3.25	7.60		2.5	21.8	6.20	573	0.38	3.25	none	cloudy	"
			3.30	7.60		2.5	21.8	6.22	575	0.24	3.19	"	"	~~SP4~~ "
			3.35	7.64		4.5	21.9	6.24	571	0.08	3.20	"	"	CPM3 90L
			3.40	7.64		5.5	21.8	6.25	572	0.07	3.19	"	"	"
			3.45	7.64		6.5-7	21.8	6.25	572	0.02	3.19	"	"	"
			~~4.50~~											SAMPLED
			BOW	TOC 9.86										
GW7			4.20	7.43		0.5	21.1	6.51	475	2.20	2.53	slight PAH odour	cloudy	CPM3 90L
			4.25	7.45		1.5	21.6	6.25	481	0.77	2.61	"	"	"
			4.30	7.47		2.5	21.8	6.15	487	0.52	2.50	"	"	"
			4.35	7.47		3.5	21.7	6.01	479	025	2.50	none	"	"
			4.40	7.47		4.5	21.8	6.00	477	0.22	2.52	"	"	"
			4.45	7.50		5.5 6.5	21.8 21.9	6.01 5.98	480 483	0.20 0.17	2.51 2.50	"	"	"
			4.50	7.50		7-7.5	21.8	5.98	482	0.18	2.51	"	"	"
			4.55	7.50										

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PT = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

* Note: wa[illegible] meter pH. 0.5↑ out *

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: Z10074	Date: 20/4/11	Sampled By: JI	Client: COPP	Site: GASWORKS

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC µScm⁻¹	Odour	Colour	Comments
GW19	~		10.35	7.65		.5	16.7	5.96	57	2.65	3.99	hydrogen sulphide	cloudy yellow	CPM4
			10.40	7.72		1.25	17.0	5.59	67	0.37	3.77	"	"	CPM1
			10.45	7.75		1.75	17.1	5.58	60	0.2	3.75	"	"	CPM3
			10.50	7.75		2.25	17.1	5.59	58	0.2	3.75	"	"	"
			10.55	7.75		2.75	17.1	5.59	55	0.19	3.75	"	"	"
			11.00	7.75		3.25	17.1	5.59	55	0.20	3.75	"	"	" (pH reading -0.5)
			11.05	7.75		3.75	17.0	5.59	50	0.28	3.76	"	"	SAMPLED
GW21	~		11.40	8.01		.5	16.3	5.55	87	62.30	1507	hydrogen sulphide	cloudy	CPM3
			11.45	8.10		1	16.6	5.32	120	0.85	2381	"	clean	CPM2
			11.50	8.10		1.5	16.6	5.28	128	0.56	2384	"	"	"
			11.55	8.10		2	16.6	5.28	129	0.50	2397	"	"	"
			12.00	8.10		2.5	16.6	5.28	130	0.52	2390	"	"	SAMPLED
GW18	~	—	DRY	—										

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

* Note: water meter pH 0.5↑ out *

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20/4/11	Sampled By: JI	Client: CoPP	Site: GASWORKS

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW22		✓	12.45	TOC 8.16		.5	17.6	5.35	547	4.25	1316	slight hydro odour	clear	CPM3
			12.50	8.26		1	17.8	5.22	602	2.85	1175	"	"	"
			12.55	8.25		1.5	17.8	5.60	853	2.81	1186	"	"	CPM2
			1.00	8.28		2	17.9	5.89	633	2.57	1192	"	"	"
			1.05	8.28		2.5	17.9	5.91	634	2.50	1196	"	"	"
			1.10	8.30		3	18.0	5.90	636	2.48	1198	"	"	SAMPLED
GW23		✓	2.25	8.78		.5	18.6	6.78	716	1.94	2265	slight hydrocarbon odour	cloudy	CPM3
			2.30	8.85		1	17.9	6.48	499	1.21	2225	"	"	CPM2
			2.35	8.87		1.5	17.8	6.32	413	1.18	2224	"	"	CPM2
			2.40	8.92		1.75	17.8	6.27	364	0.72	2234	"	"	CPM2
			2.45	8.95		2	17.8	6.06	360	0.67	2256	"	"	"
			2.50	8.95		2.25	17.8	6.05	360	0.66	2260	"	"	"
			2.55	8.95		2.5	17.8	6.04	362	0.66	2269	"	"	SAMPLED

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Pump placed approx 1m above from max bore depth.

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Field Chemical Characteristics for Water Samples

Job No: Z11074	Date: 19.4.11	Sampled By: LB	Client: Port Philip C.C	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW37			0820	8.12		1L	18.7	6.96	-26	3.54	2.38 ppk	Cloudy grey	Organic odour	4cpm pumprate
			0825	8.20		5L	19.0	7.05	-62	2.89	2.35			
			0830	8.20		11L	19.0	7.07	-69	2.89	2.33			
			0835	8.20		16L	18.9	7.08	-69	2.90	2.32 ÷0.62 = 3866 uS/cm			Sampled @ 8.45
GW8	9.40	~	0930	7.97		4L	19.0	6.80	-5	2.25	2.36 ppk	Cloudy brown → no odour		No odour on this adjacent bore GW37
			0935	8.12		6L	19.2	6.71	-24	1.33	2.35			
			0940	8.12		8L	19.3	6.69	-12	8.98 2.36 ppk				2cpm pumprate.
			0945	8.12		10L	19.2	6.43	-41	0.42	2.38			
			0950	8.12		12L	19.2	6.34	-51	0.35	2.39			
			0955	8.12		14L	19.2	6.39	-57	0.27	2.40			
			1000	8.12		16L	19.2	6.26	-61	0.20	2.40	4000		Sampled at 1005
GW32	PP30	10.46	1130	7.16		1L	19.1	7.72	52	4.30	904 ppm	none	Cloudy brown	4cpm pumprate
			1135	7.30		4L	18.9	7.82	2	6.31	924			Reduced to 2cpm
			1140	7.31		6L	18.9	7.84	-1	5.36	923			Reduced to 1cpm
			1145	7.31		8L	19.0	7.80	4	5.13	924			Slow Recovery at
			1150	7.30		10L	19.0	7.69	7	4.93	927	1545	Clear	Sampled at 1155.

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20-4-11	Sampled By: DS	Client: GPP	Site: SMG

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW3	—			8.00										
				7.90 pump		0.5	18.6	6.40	-49	2.73	3.31ppk	hydrocarbon.	light brown	2 cycle p/min
				8.10		1	18.7	6.54	-68	1.77	3.32	"	"	1 cycle p/min
				8.10		2	18.6	6.35	-71	1.18	3.33	"	"	"
				8.09		3	18.7	6.36	-70	1.18	3.32	"	"	"
				8.11		4.5	18.6	6.54	-73	1.18	3.33	"	"	"
											5330			
GW4	✓						18.6	5.20	185	3.93	558ppm		light brown.	backed dry on 20th Sampled on 21st
											= 930 µScm^{-1}			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20 · 4 · 11	Sampled By: D. JAMES	Client: City of Port Phillip	Site: South Melb Gasworks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm⁻¹	Odour	Colour	Comments
GW 43(D)	17.10	✓		7.30										
				7.37		1	19.2	6.47	159	3.28	18.6	No odour	Clear	4 cycle p/m
				7.41		4	19.8	6.54	121	-0.02	19.0ppk	No odour	"	"
				7.41		5	19.8	6.54	114	-0.03	19.0	"	"	"
				7.42		8	19.8	6.54	120	-0.03	19.1	"	"	"
											3183? or 3183			
GW 24	9.99	✓		8.87										
				8.95		2	19.4	7.22	98	0.88	4.65ppk	Hydro carbon	"	2 cycle p/m
				8.95		4	19.6	7.06	102	-0.17	4.48	"	"	
				8.95		6	19.5	7.06	108	-0.19	4.47	"	"	
				8.96		8	19.5	7.07	107	-0.18	4.47	"	"	
											7450			
GW 25	10.10	✓		7.75		2	20.4	6.45	88	5.16	304ppm		light brown	3 cycle p/m
				7.77		4	20.3	6.60	86	5.24	301ppm		"	"
				7.81		5	20.2	6.46	89	4.61	309		"	"
							20.4	6.47	86	3.95	310ppm	S17	"	

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
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SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
Pl = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20/4/11	Sampled By: DS	Client: City of Port Phillip	Site: South Melb Gasworks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW20				7.89										DRY
GW40	10.46			7.51										
				7.53		2	19.5	7.06	192	4.25	863	No odour	light brown	4 cycle
				7.55		4	19.6	7.07	196	4.38	9.04	"	"	"
				7.56		6	19.6	7.09	195	4.26	9.11	"	"	"
				7.54		8	19.7	7.08	197	4.28	9.00	"	"	"
											1500			
GW41	10.94			7.99										
			9:35	7.78		1	18.6	7.11	167	3.79	1044	"	"	"
			9:50	7.82		4	19.2	8.01	137	4.45	994	"	"	"
			10:05	7.83		5	19.2	7.55	136	4.37	993	"	"	"
			10:37	7.84		8	19.2	7.28	137	4.03	997	"	"	3 cycle
			10:45	7.84		10	19.2	7.28	135	3.77	998	"	"	"
											1663			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
Pl = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 20/9/11 | Sampled By: KK | Client: City of Port Phillip | Site: GW10

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
				8.14										
			10:18	8.22		1	18.4	4.73	225	3.31	853	none	very turbid yellow-br; cloudy	2 cpm.
				8.25		2	18.6	4.86	227	3.55	864	"	" "	
				8.26		3.5	18.7	5.00	230	3.79	907	"	"	
			10:37	8.29		5	18.7	5.04	230	3.35	931	"	" "	
				8.31		7	18.7	5.00	227	2.79	934	"	slightly turbid (clearer); yellow	WL stabilising
			10:58			8.5	18.7	5.03	228	2.57	930	"	slightly y/b	Sampled

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

Dup 4 / split 4 ?

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 21/4/11 | Sampled By: KK | Client: city of Port Phillip | Site: GW42(D)

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC ~~uScm⁻¹~~ mS/cm	Odour	Colour	Comments
GW42(D)				8.32		1.5	17.2	6.15	150	3.38	32.8	none-slight	slightly turbid	4 cpm. ~~reduced to 2 cpm~~
			7:36am	9.33		1.5	↓	↓	↓	↓	↓	↓	↓	reduced to 2 cpm
				9.60		2	17.8	5.88	163	2.17	36.0		"	
			7:~~48~~	10.06		3	17.8	5.85	161	2.19	36.2	"	"	pumping stopped to check for recovery/recharge 7:50
			7:50	10.30		paused								
			8:14	10.16										
			8:25	10.10		resumed	2~~8~~	8:28 am		~10.10m(WL)				
			8:38	10.80		4	18.0	6.16	125	3.38	33.6	none.	slightly turbid	Water column de-watering with no(little) recharge
				11.70		5	18.2	6.21	98	4.62	31.6	"	"	changed to 1 cpm
			9:12	12.57		7	18.2	6.24	89	4.66	31.3	"	"	sampled now.

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 19 APRIL	Sampled By: DT, KK	Client: City of Port Phillip	Site: South Melbourne Gasworks 3

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC ~~uScm⁻¹~~ mS/cm	Odour	Colour	Comments
GW3				8.87										
			8:27	8.99		1	18.0	7.08	121	5.24	4.64mS/cm	strong	cloudy white/yellow	4 cpm
			8:32	9.08		2	17.9	7.35	44	5.78	4.29			
			8:36	9.13		3.5	17.8	7.35	29	5.38	4.34	(ammonia?) strong	slightly cloudy	"
			8:41	9.17		4.5	17.8	7.36	26	4.95	4.47	"	" "	3cpm
			[illegible]	9.18		6.5	17.7	7.35	29	4.82	4.64	moderate odour	clear	
			8:50	9.17		8.0	17.7	7.39	34	4.86	4.75			
			8:56	9.13		9.0	17.7	7.39	33	4.79	4.76	"	"	

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
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Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 19/4/11 | Sampled By: KK, DT | Client: City of Port Phillip | Site: GW38

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC ~~uScm⁻¹~~ mS	Odour	Colour	Comments
GW38				8.99										
				9.10		2	18.3	7.20	-51	2.99	5.28	mod-strong	dark grey, turbid	stopped purging to recover
				9.10		2.2	18.3	7.07	-50	1.79	5.35	"	"	1 cycle 4/min
				9.07		3	18.6	7.02	-44	2.65	5.44	"	"	2 cycle 4/min w/c dropping
				9.15		4	18.7	7.01	-48	2.52	5.46	"	"	paused pump.
				9.10		4.5	18.6	7.01	-46	2.57	5.49		clearing slightly	1 cpm. paused again
			10:25	9.08		4.7	18.8	6.97	-47	2.79	5.51	"	slightly grey turbid	sampled.

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 9/4/11	Sampled By: KK	Client: City of Port Phillip	Site: GW12

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW12			2:10	7.82										
				7.86		1	20.4	6.47	50	3.88	819	slight	slightly turbid	3 cpm.
				7.94		2	19.6	6.42	61	3.68	797	"	mod. cloudy yl/br	
				7.99		3	19.4	6.40	67	3.74	793	"	"	
				8.17		4	19.4	6.48	72	3.00	593	"	"	Reduced to 2 cpm
			3:05	8.21		5	19.6	6.51	73	2.97	590	"		paused pump to recover
			3:27	8.15										
			3:31	8.17		6	20.2	6.51	90	3.59	598	"	becoming clearer	wl still ↓ slightly. @ 2cpm
				8.30		7.5	19.3	6.53	93	3.86	653	"	"	
			3:50	8.31		8.5	19.1	6.72	88	3.82	600	"	"	
			3:55			9.0	19.1	6.64	93	3.99	586	"	"	
				8.39		9.5	19.1	6.67	94	3.88	587	"	"	sampling commenced.

Mark

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

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Field Chemical Characteristics for Water Samples

Job No: 210774	Date: 20/4/11	Sampled By: KK	Client: City of Port Phillip	Site: GW16

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
				4.85										
				5.0		1.5	18.7	6.84	105	5.17	246	none	turbid, grey	4cpm
				5.14		2.0	18.7	6.82	104	4.77	246	"	turbid, grey silty	reduced to 3cpm
				5.20		3.5	18.6	6.88	104	4.56	244	"	slightly turbid gl/gy.	WL fluctuating during pumping
			3:42pm	5.36		4	18.6	6.89	104	4.33	244	"		reduced to 2cpm. WL ↓
			4:54	5.65		6	18.6	6.86	106	5.40	245			stopped to allow recharge
			4:10	5.71		WL	not	rising.	Left	for 10mins.		Will sample now		
				5.72		6.2	18.5	6.89	107	4.93	242			

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669) ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±3% EC ±0.05 pH ±10mV ORP The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20/4/11	Sampled By: KK	Client: City of Port Phillip	Site: GW13

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			1:36	7.60										
			1:46	7.60		1.5	19.5	6.25	115	6.11	545	none	very turbid yellow	4cpm
				7.74		2.5	19.4	6.33	111	6.19	545	"	" "	
				7.76		4	19.4	6.28	115	5.95	543	"	" "	
				7.77		5	19.4	6.26	119	5.66	543	"	" "	
			2:08	7.79		7	19.3	6.22	123	5.41	544	"	"	
						9	19.3	6.22	132	5.42	542	"	"	
			2:17			11	19.3	6.26	134	5.07	540	"		sampled. stable

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 20/4/11 | Sampled By: KR | Client: City of Port Phillip | Site: GW14

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
				7.18	✓									
			12:02	7.25		1	18.5	6.33	121	3.59	564	none	Strong yl/br very turbid	4 cpm
				7.20		2	19.0	6.56	81	2.80	548	"	" "	Mc flow reducing to pump but stabilising
			12:13	7.22		3.5	19.2	6.55	71	2.20	549	"	" "	
			12:20	7.22		5	19.3	6.56	52	1.84	551	"	" "	
				7.22		6	19.4	6.61	45	1.86	549	"	becoming slightly less turbid - still yl/br	
				7.22		7	19.4	6.60	42	1.93	521			
				7.22		8	19.4	6.63	42	2.01	546	"	"	
			~~12:40~~	7.22		~~10~~ 9	19.4	6.63	42	2.01	545	"	"	
			12:40	7.22		10	19.4	6.62	42	1.99	546			Sampled. Stable

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 20/4/11	Sampled By: KK	Client: City of Bat Phillip	Site: GW11

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			7:52am	7.21									turbid yellow cloudy	
				7.31		1.5	18.1	4.86	257	8.08	391	slight.	" turbid yl/white-milky	2 cpm
				7.34		2	18.4	5.13	266	5.70	402	slight-mod	"	
			8:12	7.42		2.5	18.5	5.59	270	4.97	405	"	"	pumping stopped to allow for some recovery
			8:29	7.33										commenced @ 8:44am
			8:44	7.29										
				7.37		3.5	18.4	5.59	262	4.97	406	"	"	WL dropping - slow recharge
				7.40		4	18.6	5.60	264	4.70	261	"	"	
			9:01	7.46		5	18.6	5.62	268	4.52	471	"	"	start sampling - slow recovery

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
Pl = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria (adapted from EPA Victoria Publication 669)
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±3% EC
±0.05 pH
±10mV ORP
The meter will be calibrated every three bores or daily (whichever occurs first) in accordance with the manufacturer's specifications

APPENDIX J PIPER PLOT CHART

Groundwater chemistry classification for OS, NW, NE and SE Groups of Wells