



Dedicated to a better Brisbane

3 September 2010

Mr Gary O'Connor
Manager, Project Support
Technical Operations
Environment and Natural Resource Regulation
Department of Environment and Resource Management
Level 8, 400 George Street
BRISBANE QLD 4000

Dear Mr O'Connor

Further to your email request of 14 June 2010 in relation to the former Willawong Waste Disposal Site, please find the following reports and information enclosed:

- 1) 'Oxley Creek Planning Study - Groundwater Risk Assessment' City Design June 2009 (this memorandum deals with this report only);
- 2) 'BCC Willawong Waste Disposal Area Site Characterisation Study'(CMPSPF 1993); and
- 3) A plan showing all the monitoring bores for the Willawong site.

The information is provided on the condition that it not be provided to third parties without the consent of Council.

Additional laboratory analysis results (for a sample collected from monitoring well BH08/06 on 18 June) are also attached in order to provide further information with respect to contamination levels at this monitoring well location. It was noted that the initial sample collected from this well on 31 October 2008 returned TPH concentrations exceeding the Dutch Guideline values however the subsequent testing confirmed TPH concentrations below the Dutch Guideline. While City Design is not certain as to the cause of the initial exceedance at this location it is possible that trace amounts of hydrocarbons may have been introduced to groundwater at this location through the drilling process and that the hydrocarbon concentrations have subsequently attenuated due to natural dispersion.

It is understood that the DERM information request is in response to claims made by Ace Waste that the Ace Waste site and area surrounding the Willawong Waste Disposal Site may have been contaminated due to migration of contaminants via groundwater movement from the Willawong Waste Disposal site.

We note that this issue was previously raised by ACE Waste through its legal representatives in 2002 and that City Design provided a detailed response refuting the claims made including providing a critique of a report by ACE Waste's consultant at that time.

Brisbane City Council ABN 72 002 765 795

**Brisbane Infrastructure
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The information available to City Design does not support a conclusion that contamination migration from the former Willawong Waste disposal site has resulted in any significant impacts on the surrounding area. If there is any specific information that ACE Waste or DERM is able to provide in support of any claims regarding contamination of the ACE Waste site, City Design would be happy to review this information and provide a further response.

If you have any queries regarding the above discussion or the attached information please do not hesitate in contacting Mr Greg McPherson, Principal Engineer, on 3027 4724.

Yours sincerely,

49-Sch4 - Signature

S. Dean Morse
Manager
City Design
Brisbane Infrastructure

49-Sch4 - Signature



Ref BNE24336

Department of
**Environment and Resource
Management**

Mr S. Dean Morse
Manager
City Design
Brisbane Infrastructure
GPO Box 1434
BRISBANE QLD 4001

Dear Mr Morse

Thank you for your letter dated 3 September 2010 regarding the Brisbane City Council City Design "Oxley Creek Planning Study – Groundwater Risk Assessment" June 2009 and the Addendum Report of July 2009.

The conclusions of the report are considered reasonable. It is noted that the groundwater monitoring results are consistent with results from nearby boreholes collected over an extended period of time.

Should you have any further enquiries, please do not hesitate to contact me on telephone 3330 5708.

Yours sincerely

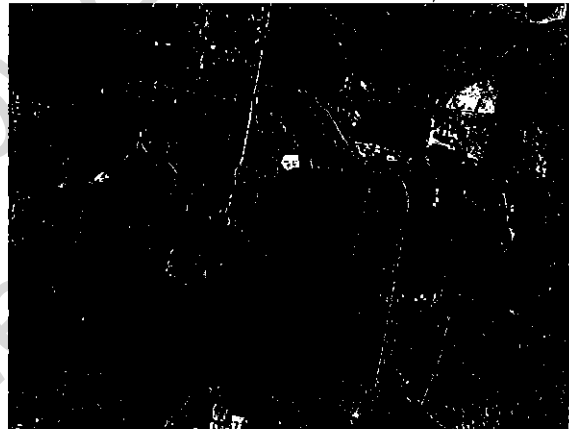
49-Sch4 - Signature

Gary O'Connor
Manager, Project Support



Oxley Creek Planning Study Groundwater Risk Assessment Addendum

July 2009



Prepared for
Strategic Planning
City Planning and Sustainability Division

Prepared by
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Issue No.	Date of Issue	Amdt	Prepared By (Author/s)		Edited and Proofread By		Reviewed By		Approved for Issue (Project Director)	
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Executive Summary

Brisbane City Council (BCC), City Policy and Strategy Division commissioned City Design Environmental Management (CDEM) to undertake an offsite groundwater risk assessment for the Oxley Creek Planning Study.

The assessment focussed on the areas to the north and east of the Willawong Waste Disposal Site (WWDS). The purpose of undertaking the groundwater assessment was to allow a more definitive assessment of the potential risks associated with changing land use in the vicinity of the WWDS.

Two rounds of groundwater monitoring were undertaken in August and October 2008. A third round of groundwater analysis was undertaken at the end of May 2009.

Based upon the results for the May 2009 monitoring round, CDEM has arrived at the following conclusions:

- Significant reductions in electrical conductivity (EC) from the August '08 and October '08 were noted at several sampling locations. This is likely to be due to dilution effects from heavy rainfall events prior to the May '09 monitoring round and demonstrates a high level of variability in groundwater water quality depending on proximity to rainfall/infiltration events;
- In general the groundwater is highly saline making it unsuitable for short or long term irrigation use;
- Exceptions to the generally high salinity were observed for groundwater samples collected from wells BH08/01 and BH08/02. The water quality recorded for these samples would allow irrigation use of this water;
- Elevated ammonia and total nitrogen concentrations were reported for BH08/09 and may be indicative of localised impacts from the former municipal waste site or a function of the wetland environment where the well was established; and
- A comparatively low redox potential and high dissolved iron concentration was reported for sample BH08/06 for all monitoring rounds. This may be associated with localised reducing conditions in the area of the monitoring well.

Based on the three monitoring rounds the shallow groundwater at the site is generally unsuitable for irrigation. Aesthetically the shallow groundwater is unsuitable for drinking however there are no results which would indicate any risk to human health if the groundwater was accidentally or deliberately ingested. There are no indicators of significant contamination migration occurring.

Based on this investigation, CDEM does not consider that there are any impediments to residential development of the areas surrounding the WWDS on the basis of any groundwater contamination issues.

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1.0 Introduction

1.1 Background

Brisbane City Council (BCC), City Policy and Strategy Division commissioned City Design Environmental Management (CDEM) to undertake an offsite groundwater risk assessment for the Oxley Creek Planning Study.

Two rounds of groundwater monitoring were undertaken in August and October 2008. A third round of groundwater analysis was undertaken at the end of May 2009. This addendum report outlines the results of laboratory analysis for the third monitoring round.

1.2 Assessment Guidelines

Groundwater investigation results were compared to the trigger values for protection of 95% of ecosystems (ANZECC, 2000) along with the Australian Drinking Water Guidelines (ADWG, 2004) and the irrigation water quality values adopted by the ANZECC Water Quality guidelines (ANZECC, 2000) including the long-term (LTV) and short-term (STV) trigger values for irrigation water.

2.0 Groundwater Analysis Results

Summaries of the analysis results for each groundwater sample analysed compared to the adopted assessment guidelines are presented in **Table 1 (Appendix A)**. The certified laboratory reports including Chain of Custody documentation and Sample Receipt Advices for the groundwater samples are presented in **Appendix B**.

It should be noted that the August '08 monitoring round did not include total petroleum hydrocarbons (TPH). The October '08 round of monitoring did not include selenium, mercury, total cyanide and organochlorine (OC) pesticides. The May '09 monitoring round did not include TPH, selenium, total cyanide and OC pesticides.

Physicochemical Parameters

pH data for the groundwater at the sampling locations measured indicate slightly acidic conditions ranging from 4.9 at BH08/09 to 5.9 at BH08/01 and BH08/04. With the exception of BH08/02 (pH 6.5), all pH data were below the acceptable limits for the Australian Drinking Water Guidelines (ADWG) of 6.5 to 8.5 and below the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC) guideline for lowland rivers in South East Queensland of 6.5 to 8.0.

Comparatively low redox potentials and high dissolved iron concentrations were reported for samples BH08/01 (50 mV and 5.4 mg/L respectively) and BH08/06 (47 mV and 12 mg/L respectively). BH08/06 also returned similar results for the August '08 and October '08 monitoring rounds. Both of these results are consistent with the October '08 monitoring round results.

Samples collected from BH08/09 also returned elevated concentrations of iron. pH for this sample was low (4.9). This result is also consistent with the results from the previous two monitoring rounds.

Laboratory data confirmed groundwater underlying the study site ranges between fresh and highly saline with conductivity ranging between 350 $\mu\text{S}/\text{cm}$ to 18,000 $\mu\text{S}/\text{cm}$. Overall there has been a significant change in the electrical conductivity (EC) results from the August '08 and October '08 monitoring results. At a number of monitoring locations the EC levels have significantly decreased. These decreases in EC (and various other ionic concentrations) are attributable to a response in water quality to significant rainfall events prior to the May '08 monitoring round which will have resulted in significant infiltration in the study area.

Despite the reductions in EC the groundwater water quality generally remained too saline for it to be suitable for irrigation purposes. The EC levels in BH08/01 and BH08/02 were exceptions in this regard.

Cations & Anions

Eight groundwater samples returned sodium concentrations exceeding the groundwater irrigation water quality moderately sensitive range of 115-230 mg/L and moderately tolerant range of 230-460 mg/L. With the exception of BH08/05, BH08/06 and BH08/07, these samples also exceeded the ADWG of 180 mg/kg. In general the sodium concentrations were lower than those reported for the August '08 and October '08 monitoring rounds.

The generally lower sodium concentrations reported for the May '09 monitoring round are indicative of the dilution effects of rainfall infiltration prior to sample collection. In general, the sodium concentrations noted above would have the potential to detrimentally affect soil structure if used for irrigation purposes.

Nutrients

Three groundwater samples returned total nitrogen concentrations exceeding the groundwater irrigation water quality Long-term Trigger Value (LTV) for total nitrogen of 5 mg/L. Two of these samples returned concentrations greater than the August '08 and October '08 monitoring round results.

None of the nitrogen concentrations reported exceeded the lower limit of the groundwater irrigation water quality Short-term Trigger Value (STV) of 25-125 mg/L nor are the total nitrogen levels indicative of levels that would pose a risk to human health if consumed.

Elevated ammonia and total nitrogen concentrations above the ADWG and ANZECC guidelines were returned for BH08/09 (ammonia: 5.4 mg/L and total nitrogen: 8.6 mg/L). This may be indicative of localised impacts from the Willawong Waste Disposal Site (WWDS) leachate or a function of the wetland environment where the well was established. The levels are moderate but are considered slightly higher than levels typically found within a wetland system. The ammonia level was slightly higher than those reported for the August '08 (ammonia: 4.9 mg/L) and October '08 (ammonia: 5.2 mg/L and total nitrogen: 16 mg/L) monitoring rounds while total nitrogen was lower.

Nine groundwater samples returned concentrations for phosphorous exceeding the groundwater irrigation water quality LTV of 0.05 mg/L for total phosphorus. Also it should be noted that the values are all well below the groundwater irrigation water quality STV of 0.8 – 12 mg/L. There are no ANZECC trigger values or ADWGs for total nitrogen or total phosphorus.

Metals

Cadmium

All of the groundwater samples collected returned cadmium concentrations below the groundwater irrigation water quality LTV for cadmium of 0.01 mg/L and the STV of 0.05 mg/L.

All the groundwater samples collected returned cadmium concentrations below or equal to the ADWG value for cadmium of 0.0002 mg/L.

Chromium

All of the groundwater samples collected returned chromium concentrations below the groundwater irrigation water quality LTV for chromium of 0.1 mg/L and the STV of 1 mg/L.

Two groundwater samples collected (samples BH08/06 and BH08/08) returned chromium concentrations in excess of the ANZECC guideline of 0.001 mg/L. All of the groundwater samples collected returned chromium concentrations below the ADWG value for chromium of 0.05 mg/L.

Cobalt

All of the groundwater samples collected returned cobalt concentrations below the groundwater irrigation water quality LTV for cobalt of 0.05 mg/L. These results are also below the groundwater irrigation water quality STV of 0.1 mg/L for cobalt. There is no ANZECC trigger value or ADWG for cobalt.

Copper

All of the groundwater samples collected returned copper concentrations below the groundwater irrigation water quality LTV for copper of 0.2 mg/L and the STV of 5 mg/L.

Two groundwater samples (samples BH08/06 and BH08/08) returned concentrations for copper definitively exceeding the ANZECC trigger value of 0.0014 mg/L. The laboratory level of reporting of 0.002 mg/l exceeded the ANZECC trigger level for copper of 0.0014 therefore no conclusive determinations can be made with respect to whether the concentrations for the remaining eight samples are below or exceed this trigger. No results exceeded the ADWG value of 1 mg/L (aesthetic considerations) and 2 mg/L (health considerations) for copper.

Iron

Five groundwater samples collected returned iron concentrations exceeding the groundwater irrigation water quality LTV for iron of 0.2 mg/L. These samples also exceeded the drinking water guideline value of 0.3 mg/L.

Two of the groundwater samples listed above returned iron concentrations exceeding the groundwater irrigation water quality STV for iron of 10 mg/L. There is no ANZECC trigger value for iron.

The iron concentrations reported for these samples would indicate that use of water from these locations could cause problems in terms of clogging of irrigation systems and would be likely to produce significant iron staining if used for any purpose. Aesthetically, the iron concentrations would affect "taste" and may make the water consumed unpalatable.

Lead

All of the groundwater samples collected returned lead concentrations below the groundwater irrigation water quality LTV for lead of 2 mg/L and the STV of 5 mg/L. All groundwater samples were below the ADWG of 0.01 mg/L.

One groundwater sample collected returned a lead concentration exceeding the ANZECC guideline of 0.0034 mg/L.

Nickel

All of the groundwater samples collected returned nickel concentrations below the groundwater irrigation water quality LTV for lead of 0.2 mg/L and the STV of 2 mg/L.

Two groundwater samples collected returned nickel concentrations exceeding the ANZECC guideline of 0.011 mg/L. Two samples also exceeded the ADWG value of 0.02 mg/L.

Zinc

All of the groundwater samples collected returned zinc concentrations below the ADWG value of 3 mg/L and the groundwater irrigation water quality LTV for zinc of 2 mg/L and the STV of 5 mg/L.

Nine groundwater samples returned concentrations for zinc exceeding the ANZECC trigger value of 0.008 mg/L.

The other three metal parameters (arsenic, barium and mercury) analysed were returned at concentrations below the groundwater irrigation quality guideline values for LTV and STV, the ANZECC guidelines and the ADWG values.

Aromatic Hydrocarbons

While there are no groundwater irrigation quality guideline values for long-term irrigation (LTV) for aromatic hydrocarbons, all concentrations were below laboratory limits of reporting.

The benzene and 1:4-Dichlorobenzene concentrations reported for all samples were below the ADWG health based guidelines.

3.0 Conclusions

Based upon the results for the May 2009 monitoring round, CDEM has arrived at the following conclusions:

- Significant reductions in electrical conductivity (EC) from the August '08 and October '08 were noted at several sampling locations. This is likely to be due to dilution effects from heavy rainfall events prior to the May '08 monitoring round and demonstrates a high level of variability in groundwater water quality depending on proximity to rainfall/infiltration events;
- In general the shallow groundwater is highly saline making it unsuitable for short or long term irrigation use;
- Exceptions to the generally high salinity were observed for groundwater samples collected from wells BH08/01 and BH08/02. The water quality recorded for these samples would allow irrigation use of this water;
- Elevated ammonia and total nitrogen concentrations were reported for BH08/09 and may be indicative of localised impacts from the former municipal waste site or a function of the wetland environment where the well was established; and
- A comparatively low redox potential and high dissolved iron concentration was reported for sample BH08/06 for all monitoring rounds. This may be associated with localised reducing conditions in the area of the monitoring well.

Based on the three monitoring rounds the shallow groundwater at the site is generally unsuitable for irrigation. Aesthetically the shallow groundwater is unsuitable for drinking however there are no results which would indicate any risk to human health if the groundwater was accidentally or deliberately ingested. There are no indicators of significant contamination migration occurring.

Based on this investigation, CDEM does not consider that there are any impediments to residential development of the areas surrounding the WWDS on the basis of any groundwater contamination issues.

4.0 References

Australian and New Zealand Environment and Conservation Council (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

Fetter, C.W. (1999) *Contaminant Hydrogeology*

National Health and Medical Research Council (2004) *Australian Drinking Water Guidelines*.

5.0 Statement of Limitations

We have performed our services for this project in accordance with our current professional standards; no guarantees are either expressed or implied.

There is no investigation that is thorough enough to preclude the presence of material that presently, or in the future, may be considered hazardous at the site. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under regulatory standards that require investigation/remediation.

This report has been prepared based on data from the indicated sources, site inspections and sampling/analysis results. Laboratory analyses at sample points may not be representative of all conditions across the site. Inferences about the nature and continuity of conditions arising from the sample points, where made, can not be guaranteed.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of the current regulatory standards, should not be construed as legal opinions. This document and the information contained herein have been prepared solely for the use of the client. Any reliance on this report by any other third parties shall be at such party's sole risk.

Information obtained from interviews, site inspections and contained in the documentation reviewed has been assumed to be correct and complete. Environmental Management does not accept any liability for misrepresentation of information or for items not visible, accessible, nor able to be inspected at the sites at the time of the site visits.

Appendix A Summary of Laboratory Analysis Results

Released by EHP
under the
RTI Act 2009

Table 1. Groundwater Analytical Results - May 2009

Sample ID					BH08/01	BH08/02	BH08/03	BH08/04	BH08/05	BH08/06	BH08/07	BH08/08	BH08/09	BH08/10
Date of collection					27/05/09	27/05/09	27/05/09	27/05/09	27/05/09	27/05/09	27/05/09	27/05/09	27/05/09	27/05/09
ANALYTE	Assessment Guidelines													
	LTV (mg/L)	STV (mg/L)	EE (mg/L)	EE (µg/L)										
PHYSICO-CHEMICAL PARAMETERS														
pH (pH units)	-	-	-	-	5.9	6.5	5.7	5.9	5.2	5.7	5.8	5.4	4.9	5.7
Conductivity (µS/cm)	-	-	-	-	580	350	1,200	18,000	860	920	880	3,100	5,700	14,000
TDS	-	-	-	-	370	230	740	12,000	550	590	570	2,000	3,600	8,700
Dissolved Oxygen - field	-	-	-	-	2.7	5.5	4.0	3.7	5.3	3.0	3.0	5.0	3.0	3.6
Redox Potential (mV)	-	-	-	-	50	150	180	160	230	47	62	210	170	110
CATIONS & ANIONS														
Calcium	-	-	-	-	2.9	0.8	1.2	39	0.5	17	1.2	5.5	14.0	11
Magnesium	-	-	-	-	5.7	3.9	23	340	16	16	7.9	37	99	330
Sodium	-	-	-	-	97	46	190	3,300	140	130	150	590	940	2,300
Potassium	-	-	-	-	2.6	3.3	4.5	12	2.0	2.2	3.0	2.9	7.4	16
Sulphur as SO4	-	-	-	-	29	12	33	89	55	56	18	580	68	280
Total Alkalinity	-	-	-	-	55	64	46	110	5.1	67	50	19	6.4	67
Chloride	-	-	-	-	110	61	250	6,400	200	200	220	570	2,900	4,800
NUTRIENTS														
Ammonia	-	-	0.90	-	0.19	0.009	0.15	0.023	0.005	0.16	0.052	0.033	5.4	0.34
Nitrite + Nitrate	-	-	-	-	0.007	0.03	22	0.01	0.18	0.019	0.004	22	0.022	0.014
Total Nitrogen	5	-	-	-	0.69	0.88	21	0.19	0.38	3.7	0.38	24	8.6	0.34
Orthophosphorus	-	-	-	-	0.018	0.014	0.02	0.048	0.02	0.15	0.018	0.022	0.028	0.04
Total Phosphorus	0.05	-	-	-	0.14	0.12	1.1	0.23	0.094	1.3	0.280	0.075	0.75	0.04
METALS (dissolved)														
Arsenic	0.1	2	0.013	-	0.004	<0.001	<0.001	<0.001	<0.001	0.008	0.002	0.002	0.004	0.004
Barium	-	-	-	-	0.06	0.018	0.22	0.37	0.15	0.032	0.098	0.038	0.24	0.082
Cadmium	0.01	0.05	0.002	-	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Chromium	0.1	1	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.002	<0.001	<0.001
Cobalt	0.05	0.1	-	-	0.008	0.003	0.004	0.018	0.003	0.012	0.005	0.046	0.019	0.087
Copper	0.2	5	0.0014	-	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	0.021	<0.002	<0.002
Iron	0.2	10	-	-	5.4	0.15	0.036	0.022	0.019	12	1.7	0.049	21	4.6
Lead	2	5	0.0034	-	0.001	0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	0.002	<0.001
Nickel	0.2	2	0.011	-	0.003	0.00	0.004	0.01	0.002	0.006	0.003	0.022	0.017	0.032
Zinc	2	5	0.008	-	0.05	0.054	0.013	0.023	0.007	0.07	0.041	0.049	0.28	0.069
AROMATIC HYDROCARBONS														
Benzene (µg/L)	-	-	950	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,4-Dichlorobenzene (µg/L)	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
NOTES:														
mg/L	All Results in mg/L Unless Otherwise Specified													
LTV	Groundwater Long-term Trigger Values (LTV) (ANZECC, 2000)													
STV	Groundwater Short-term Trigger Values (STV) (ANZECC, 2000)													
	Fresh Water Guideline Values - 95% protection (ANZECC, 2000)													
	Dutch Guidelines - Environmental Quality Standards in the Netherlands (1999)													
nt	Not tested													
"-"	Not Available/Not Relevant													

Table 2. Groundwater Analytical Results - October 2008

Sample ID					BH08/01	BH08/02	BH08/03	BH08/04	BH08/05	BH08/06	BH08/07	BH08/08	BH08/09	BH08/10
Date of collection					31/10/08	31/10/08	31/10/08	31/10/08	31/10/08	31/10/08	31/10/08	31/10/08	31/10/08	31/10/08
ANALYTE	Assessment Guidelines													
	LTV (mg/L)	STV (mg/L)	(mg/L)	(µg/L)										
PHYSICOCHEMICAL PARAMETERS														
pH (pH units)	-	-	-	-	6.0	5.7	6.0	5.8	5.2	5.6	6.2	4.8	4.5	5.6
Conductivity (µS/cm)	-	-	-	-	650	8,500	990	18,000	1,100	4,000	2,800	4,700	8,100	15,000
TDS	-	-	-	-	410	5,400	630	12,000	680	2,600	1,800	3,000	5,200	9,800
Dissolved Oxygen - field	-	-	-	-	2.2	6.2	3.5	2.9	3.4	2.7	2.5	3.4	2.6	2.8
Redox Potential (mV)	-	-	-	-	38	160	150	100	220	-15	110	290	190	130
CATIONS & ANIONS														
Calcium	-	-	-	-	2.7	13	2.1	40	0.4	55	0.9	3.2	1.4	14
Magnesium	-	-	-	-	5.7	230	21	370	21	77	32	110	130	410
Sodium	-	-	-	-	110	1,400	140	3,400	180	600	560	760	1,500	2,700
Potassium	-	-	-	-	2.3	9.5	7.2	11.0	0.9	2.7	1.7	1.8	5.8	16.0
Sulphur as SO4	-	-	-	-	36	46	24	87	28	160	190	26	83	310
Total Alkalinity	-	-	-	-	59	51	76	100	8.7	66	170	6	<1.0	60
Chloride	-	-	-	-	120	2,800	190	7,000	340	1,100	650	1,500	2,700	5,500
Total Cyanide	-	-	0.007	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
NUTRIENTS														
Ammonia	-	-	0.90	-	0.16	0.06	0.02	0.016	0.03	0.44	0.027	0.035	0.01	0.14
Nitrite + Nitrate	-	-	-	-	0.006	2.6	7.8	0.02	0.11	0.015	0.075	0.042	0.01	0.013
Total Nitrogen	5	-	-	-	0.27	3.8	16	0.19	0.28	2.2	0.7	0.78	10	0.36
Orthophosphorus	-	-	-	-	0.009	0.048	0.011	0.028	0.013	0.032	0.021	0.018	0.02	0.013
Total Phosphorus	0.05	-	-	-	0.086	0.055	0.015	0.035	0.024	0.15	0.052	0.031	0.057	0.01
METALS (dissolved)														
Arsenic	0.1	2	0.013	-	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Barium	-	-	-	-	0.05	0.68	0.19	0.39	0.25	0.22	0.34	0.56	0.28	0.1
Cadmium	0.01	0.05	0.002	-	<0.001	0.001	<0.001	0.0002	<0.001	<0.001	0.0002	0.0012	0.0004	0.0002
Chromium	0.1	1	-	-	<0.002	<0.002	<0.002	<0.002	<0.001	0.003	<0.002	<0.002	0.002	<0.002
Cobalt	0.05	0.1	-	-	0.012	0.036	0.008	0.03	0.005	0.052	0.004	0.004	0.013	0.1
Copper	0.2	5	0.0014	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	0.2	10	-	-	5.7	0.013	0.021	0.130	0.075	70	0.17	0.17	43	1.7
Lead	2	5	0.0034	-	0.024	<0.001	<0.001	0.0002	0.13	<0.001	0.332	0.0012	0.001	<0.001
Nickel	0.2	2	0.011	-	0.016	0.02	0.021	0.015	0.003	0.013	0.005	0.004	0.01	0.002
Selenium	0.02	0.1	-	-	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt
Zinc	2	5	0.008	-	0.02	0.05	0.01	0.025	0.023	0.02	0.022	0.02	0.025	0.004
Mercury (µg/L)	-	-	-	-	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt
ORGANOCHLORINE PESTICIDES														
alpha-Endosulfan (µg/L)	-	-	-	-	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt
beta-Endosulfan (µg/L)	-	-	-	-	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt
AROMATIC HYDROCARBONS														
Benzene (µg/L)	-	-	950	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,4-Dichlorobenzene (µg/L)	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TOTAL PETROLEUM HYDROCARBONS														
C6-C9 Fraction	-	-	-	600	<10	<10	<10	13	<10	<10	<10	<10	58	<10
C10-C14 Fraction	-	-	-	600	<50	<50	<50	<50	<50	-	<50	-	110	<50
C15-C28 Fraction	-	-	-	600	56	<50	<50	<50	<50	-	<50	-	170	<50
C29-C36 Fraction	-	-	-	600	51	<50	<50	<50	<50	-	<50	-	<50	<50
NOTES:														
mg/L	All Results in mg/L Unless Otherwise Specified													
LTV	Groundwater Long-term Trigger Values (LTV) (ANZECC, 2000)													
STV	Groundwater Short-term Trigger Values (STV) (ANZECC, 2000)													
	Fresh Water Guideline Values - 95% protection (ANZECC, 2000)													
	Dutch Guidelines - Environmental Quality Standards in the Netherlands (1999)													
nt	Not tested													
"-"	Not Available/Not Relevant													

Table 3. Groundwater Analytical Results - August 2008

Sample ID				BH08/01	BH08/02	BH08/03	BH08/04	BH08/05	BH08/06	BH08/07	BH08/08	BH08/09	BH08/10
Date of collection				27/08/08	27/08/08	27/08/08	27/08/08	27/08/08	27/08/08	27/08/08	27/08/08	27/08/08	27/08/08
ANALYTE	Assessment Guidelines												
	LTV	STV											
	(mg/L)	(mg/L)	(mg/L)										
PHYSICOCHEMICAL PARAMETERS													
pH (pH units)	-	-	-	5.5	5.6	6.1	5.8	5.4	5.6	6.2	5.5	4.5	5.6
Conductivity (µS/cm)	-	-	-	580	8,800	940	17,000	940	2,700	2,000	2,900	7,600	10,000
TDS	-	-	-	11,000	5,700	600	11,000	600	1,700	1,300	1,900	4,800	6,600
Dissolved Oxygen - field (mg/L)	-	-	-	5.8	7.1	4.1	4.4	4.4	3.1	3.3	4.4	4.1	4.8
Redox Potential (mV)	-	-	-	140	130	120	65	200	3.7	86	220	220	160
CATIONS & ANIONS													
Calcium	-	-	-	1.6	17	2.6	40	0.4	44	0.9	7.1	8	13
Magnesium	-	-	-	4.4	240	19	340	17	58	22.0	54	130	240
Sodium	-	-	-	100	1,400	130	3,300	160	400	430.0	490	1,400	1,900
Potassium	-	-	-	1.6	8.3	7.7	8	0.8	1.6	1.6	1.5	4.4	9.8
Sulphur as SO ₄	-	-	-	58	70	25	100	30	130	140.0	35	83	270
Total Alkalinity	-	-	-	23	55	85	100	16	100	150.0	51	5.7	42
Chloride	-	-	-	120	3,000	180	6,100	330	730	550	600	2,700	3,100
Total Cyanide	-	-	0.007	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
NUTRIENTS													
Ammonia	-	-	0.90	0.041	0.011	0.023	0.023	0.015	0.24	-	0.021	0.021	0.12
Nitrite + Nitrate	-	-	-	0.014	4.1	7.4	0.022	0.12	<0.002	0.084	0.15	<0.002	0.013
Total Nitrogen	5	-	-	0.73	5.5	13	0.36	2.2	4.3	7.4	10	14	0.42
Orthophosphorus	-	-	-	0.042	0.043	0.011	0.069	0.022	0.024	0.024	0.012	0.029	0.018
Total Phosphorus	0.05	-	-	0.13	0.13	0.093	0.2	0.092	0.48	0.17	0.097	0.21	0.064
METALS (dissolved)													
Arsenic	0.1	2	0.013	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	0.004	<0.001
Barium	-	-	-	0.051	0.62	0.13	0.32	0.2	0.15	0.25	0.32	0.39	0.078
Cadmium	0.01	0.05	0.002	<0.001	0.001	<0.001	0.0002	<0.001	<0.001	0.0002	0.0012	0.0004	0.0002
Chromium	0.1	1	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	0.05	0.1	-	0.01	0.053	0.012	0.037	0.005	0.051	0.009	0.028	0.023	0.069
Copper	0.2	5	0.0014	<0.005	0.033	0.068	0.087	<0.005	66	0.029	0.053	37	1.4
Iron	0.2	10	-	<0.005	0.033	0.068	0.087	<0.005	66	0.029	0.053	37	1.4
Lead	2	5	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.001	<0.001
Nickel	0.2	2	0.011	<0.001	0.001	0.001	0.001	0.003	0.003	0.005	0.017	0.002	0.002
Selenium	0.02	0.1	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	2	5	0.008	<0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Mercury (µg/L)	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ORGANOCHLORINE PESTICIDES													
alpha-Endosulfan (µg/L)	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan (µg/L)	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
AROMATIC HYDROCARBONS													
Benzene (µg/L)	-	-	950	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,4-Dichlorobenzene (µg/L)	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
NOTES:													
mg/L	All Results in mg/L Unless Otherwise Specified												
LTV	Groundwater Long-term Trigger Values (LTV) (ANZECC, 2000)												
STV	Groundwater Short-term Trigger Values (STV) (ANZECC, 2000)												
-	Fresh Waters Guideline Values - 95% protection (ANZECC, 2000)												
"-"	Not Available/Not Relevant												

Appendix B Laboratory Analysis Results

Released by EHP
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Scientific Analytical Services

ABN 72 002 765 795

Biological Accreditation Number 11085
Chemical Accreditation Number 11750

180 Ashridge Road
Darra Brisbane Qld 4076

Telephone 07 3407 2666
Facsimile 07 3407 2690

A unit of Brisbane City Council

SCIENTIFIC ANALYTICAL SERVICES LABORATORY REPORT

Client: Kate Atkins
Environmental Scientist
Green Square South Tower
505 St Paul's Terrace
Fortitude Valley

Job Name: WWREM - Bore Run 5

Sampled By: SAS Laboratory
Sampling Date: 27/05/2009
Sampling Method: Grab
Sample Matrix: Aqueous
Batch Number: 09/05847
Registration Date: 27 May 2009
Date of Report: 24 June 2009

49-Sch4 - Signature

Patti O'Shea
Supervising Chemist

Please note that for samples not collected by SAS Laboratory, the above results refer only to the samples tested, and not to the batches from which they were drawn.

Note: Method with * indicates test not covered by current terms of NATA accreditation.



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**TECHNICAL
COMPETENCE**

This document is issued in
accordance with NATA's
accreditation requirements

Page 1 of 4

Client: Environmental Scientist
Job Name: WWREM - Bore Run 5

Batch Number: 09/05847
Report Date: 24/06/09

Method	Test	Units	09/05847/1 BH08/01	09/05847/2 BH08/02	09/05847/3 BH08/03	09/05847/4 BH08/04
F.002	pH - Field	pH Unit	5.9	6.5	5.7	5.9
F.007	Conductivity - Field	uS/cm	580	350	1,200	18,000
F.007	Total Dissolved Salt Est.	mg/L	370	230	740	12,000
F.005	Temperature - Field	° C	23.7	21.6	23.3	22.8
F.014	Redox Potential	mV	50	150	180	160
F.004	Dissolved O ₂ - Field	mg/L	2.7	5.5	4.0	3.7
1.603	Total Organic Carbon as C	mg/L	5.9	13	5.4	<5.0
5.304F	Sulphur as SO ₄ (Soluble)	mg/L	29	12	33	89
1.012	Total Alkalinity as CaCO ₃	mg/L	55	64	46	110
5.012	Bicarbonate Alkalinity as CaCO ₃	mg/L	55	64	46	110
5.012	Carbonate Alkalinity as CaCO ₃	mg/L	<1.0	<1.0	<1.0	<1.0
FIA.109	Chloride	mg/L	110	61	250	6,400
FIA.010B	Nitrite+Nitrate as N	mg/L	0.007	0.030	22	0.010
FIA.008	Ammonia N	mg/L	0.19	0.009	0.15	0.023
FIA.013	Total Nitrogen as N	mg/L	0.69	0.88	21	0.19
FIA.011A	Ortho Phosphorus as P	mg/L	0.018	0.014	0.020	0.048
FIA.011B	Total Phosphorus as P	mg/L	0.14	0.12	1.1	0.23
5.304F	Calcium (Soluble) as Ca	mg/L	2.9	0.8	1.2	39
5.304F	Magnesium (Soluble) as Mg	mg/L	5.7	3.9	23	340
5.304F	Sodium (Soluble) as Na	mg/L	97	46	190	3,300
5.304F	Potassium (Soluble) as K	mg/L	2.6	3.3	4.5	12
5.304F	Barium (Soluble) as Ba	mg/L	0.060	0.018	0.22	0.37
5.304F	Cobalt (Soluble) as Co	mg/L	0.008	0.003	0.004	0.018
5.304F	Chromium (Soluble) as Cr	mg/L	<0.001	<0.001	<0.001	<0.001
5.304F	Copper (Soluble) as Cu	mg/L	<0.002	<0.002	<0.002	<0.002
5.304F	Iron (Soluble) as Fe	mg/L	5.4	0.15	0.036	0.022
5.304F	Nickel (Soluble) as Ni	mg/L	0.003	<0.002	0.004	0.01
5.304F	Zinc (Soluble) as Zn	mg/L	0.050	0.054	0.013	0.023
5.307F*	Arsenic (Soluble)	mg/L	0.004	<0.001	<0.001	<0.001
External	ALS Batch No.	Text	EB0908536	[NR]	[NR]	[NR]
External	*Organics	Text	Complete	Complete	Complete	Complete
External	Cd,Pb	Text	Complete	Complete	Complete	Complete

Please note that for samples not collected by SAS Laboratory, the above results refer only to the samples tested, and not to the batches from which they were drawn.

Note: Method with * indicates test not covered by current terms of NATA accreditation.

Client: Environmental Scientist
Job Name: WWREM - Bore Run 5

Batch Number: 09/05847
Report Date: 24/06/09

Method	Test	Units	09/05847/5 BH08/05	09/05847/6 BH08/06	09/05847/7 BH08/07	09/05847/8 BH08/08
F.002	pH - Field	pH Unit	5.2	5.7	5.8	5.4
F.007	Conductivity - Field	uS/cm	860	920	880	3,100
F.007	Total Dissolved Salt Est.	mg/L	550	590	570	2,000
F.005	Temperature - Field	° C	22.5	21.7	22.0	22.7
F.014	Redox Potential	mV	230	47	62	210
F.004	Dissolved O2 - Field	mg/L	5.3	3.0	3.0	5.0
1.603	Total Organic Carbon as C	mg/L	5.4	31	5.6	44
5.304F	Sulphur as SO4 (Soluble)	mg/L	55	56	18	580
1.012	Total Alkalinity as CaCO3	mg/L	5.1	67	50	19
5.012	Bicarbonate Alkalinity as CaCO3	mg/L	5.0	67	50	19
5.012	Carbonate Alkalinity as CaCO3	mg/L	<1.0	<1.0	<1.0	<1.0
FIA.109	Chloride	mg/L	200	200	220	570
FIA.010B	Nitrite+Nitrate as N	mg/L	0.18	0.019	0.004	22
FIA.008	Ammonia N	mg/L	0.005	0.16	0.052	0.033
FIA.013	Total Nitrogen as N	mg/L	0.38	3.7	0.38	24
FIA.011A	Ortho Phosphorus as P	mg/L	0.020	0.15	0.018	0.022
FIA.011B	Total Phosphorus as P	mg/L	0.094	1.3	0.28	0.075
5.304F	Calcium (Soluble) as Ca	mg/L	0.5	17	1.2	5.5
5.304F	Magnesium (Soluble) as Mg	mg/L	16	16	7.9	37
5.304F	Sodium (Soluble) as Na	mg/L	140	130	150	590
5.304F	Potassium (Soluble) as K	mg/L	2.0	2.2	3.0	2.9
5.304F	Barium (Soluble) as Ba	mg/L	0.15	0.032	0.098	0.038
5.304F	Cobalt (Soluble) as Co	mg/L	0.003	0.012	0.005	0.046
5.304F	Chromium (Soluble) as Cr	mg/L	<0.001	0.003	<0.001	0.002
5.304F	Copper (Soluble) as Cu	mg/L	<0.002	0.005	<0.002	0.021
5.304F	Iron (Soluble) as Fe	mg/L	0.019	12	1.7	0.049
5.304F	Nickel (Soluble) as Ni	mg/L	<0.002	0.006	0.003	0.022
5.304F	Zinc (Soluble) as Zn	mg/L	0.007	0.070	0.041	0.049
5.307F*	Arsenic (Soluble)	mg/L	<0.001	0.008	0.002	0.002
External	*Organics	Text	Complete	Complete	Complete	Complete
External	Cd,Pb	Text	Complete	Complete	Complete	Complete

Please note that for samples not collected by SAS Laboratory, the above results refer only to the samples tested, and not to the batches from which they were drawn.

Note: Method with * Indicates test not covered by current terms of NATA accreditation.

Client: Environmental Scientist
Job Name: WWREM - Bore Run 5

Batch Number: 09/05847
Report Date: 24/06/09

Method	Test	Units	09/05847/9 BH08/09	09/05847/10 BH08/10	09/05847/11 Duplicate	09/05847/12 Field Blank
F.002	pH - Field	pH Unit	4.9	5.7	[NR]	[NR]
F.007	Conductivity - Field	uS/cm	5,700	14,000	[NR]	[NR]
F.007	Total Dissolved Salt Est.	mg/L	3,600	8,700	[NR]	[NR]
F.005	Temperature - Field	°C	22.1	21.8	[NR]	[NR]
F.014	Redox Potential	mV	170	110	[NR]	[NR]
F.004	Dissolved O2 - Field	mg/L	3.0	3.6	[NR]	[NR]
1.603	Total Organic Carbon as C	mg/L	33	6.1	45	<5.0
5.304F	Sulphur as SO4 (Soluble)	mg/L	68	280	55	<1
1.012	Total Alkalinity as CaCO ₃	mg/L	6.4	67	67	3.1
5.012	Bicarbonate Alkalinity as CaCO ₃	mg/L	6.0	67	[NR]	[NR]
5.012	Carbonate Alkalinity as CaCO ₃	mg/L	<1.0	<1.0	[NR]	[NR]
FIA.109	Chloride	mg/L	2,900	4,800	210	<1
FIA.010B	Nitrite+Nitrate as N	mg/L	0.022	0.014	0.017	<0.002
FIA.008	Ammonia N	mg/L	5.4	0.16	0.16	<0.004
FIA.013	Total Nitrogen as N	mg/L	8.6	0.34	3.1	0.02
FIA.011A	Ortho Phosphorus as P	mg/L	0.028	0.040	0.14	0.009
FIA.011B	Total Phosphorus as P	mg/L	0.75	0.040	1.0	<0.010
5.304F	Calcium (Soluble) as Ca	mg/L	14	11	17	0.2
5.304F	Magnesium (Soluble) as Mg	mg/L	99	330	16	<0.5
5.304F	Sodium (Soluble) as Na	mg/L	940	2,300	130	<5
5.304F	Potassium (Soluble) as K	mg/L	7.4	16	2.2	0.7
5.304F	Barium (Soluble) as Ba	mg/L	0.24	0.082	0.033	<0.002
5.304F	Cobalt (Soluble) as Co	mg/L	0.019	0.087	0.012	<0.001
5.304F	Chromium (Soluble) as Cr	mg/L	<0.001	<0.001	0.002	<0.001
5.304F	Copper (Soluble) as Cu	mg/L	<0.002	<0.002	0.004	0.003
5.304F	Iron (Soluble) as Fe	mg/L	21	4.6	12	0.034
5.304F	Nickel (Soluble) as Ni	mg/L	0.017	0.032	0.006	<0.002
5.304F	Zinc (Soluble) as Zn	mg/L	0.28	0.069	0.072	0.006
5.307F*	Arsenic (Soluble)	mg/L	0.004	0.004	0.008	<0.001
External	*Organics	Text	Complete	Complete	Complete	Complete
External	Cd,Pb	Text	Complete	Complete	Complete	Complete

[ND] - Not Detected [NR] - Not Required [NT] - Not Tested

Please note that for samples not collected by SAS Laboratory, the above results refer only to the samples tested, and not to the batches from which they were drawn.

Note: Method with * indicates test not covered by current terms of NATA accreditation.



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB0908536	Page	: 1 of 7
Client	: BRISBANE CITY COUNCIL	Laboratory	: Environmental Division Brisbane
Contact	: MR BOB GRAY	Contact	: Tim Kilmister
Address	: ANALYTICAL SERVICES SECTION- 180 ASHRIDGE ROAD DARRA QLD, AUSTRALIA 4106	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: Bob.Gray@brisbane.qld.gov.au	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: +61 34032622	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 34032646	Facsimile	: +61-7-3243 7218
Project	: WW 2805-1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ---	Date Samples Received	: 28-MAY-2009
C-O-C number	: ---	Issue Date	: 04-JUN-2009
Sampler	: ---	No. of samples received	: 12
Site	: ---	No. of samples analysed	: 12
Quote number	: BN/455/08		

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Inorganics
Sarah Ashworth	Organic Chemist	Organics
Stephen Hislop	Senior Inorganic Chemist	Inorganics

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Page : 3 of 7
Work Order : EB0903536
Client : BRISBANE CITY COUNCIL
Project : WV 2805-1



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 insufficient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

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Page : 4 of 7
 Work Order : EB0908536
 Client : BRISBANE CITY COUNCIL
 Project : WW 2805-1



Analytical Results

Sub-Matrix: WATER

				Client sample ID	BH08/01 09/05847/1	BH08/02 09/05847/2	BH08/03 09/05847/3	BH08/04 09/05847/4	BH08/05 09/05847/5
Client sampling date / time					27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00
Compound	CAS Number	LOR	Unit		EB0908536-001	EB0908536-002	EB0908536-003	EB0908536-004	EB0908536-005
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Lead	7439-92-1	0.001	mg/L		<0.001	0.001	<0.001	<0.001	<0.001
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
1,4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
2,4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%		104	103	107	98.7	101
Toluene-D8	2037-26-5	0.1	%		96.7	96.9	94.6	92.9	95.0
4-Bromofluorobenzene	460-00-4	0.1	%		92.8	90.7	92.9	88.2	88.7
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		41.2	34.3	32.5	38.2	35.6
2-Chlorophenol-D4	93951-73-6	0.1	%		98.4	89.5	85.0	93.9	92.7
2,4,6-Tribromophenol	118-79-6	0.1	%		105	97.9	98.4	109	106
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		116	106	105	111	113
Anthracene-d10	1719-06-8	0.1	%		111	105	104	105	111
4-Terphenyl-d14	1718-51-0	0.1	%		124	121	118	125	129

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Analytical Results

Sub-Matrix: WATER

				Client sample ID	BH08/06 09/05847/6	BH08/07 09/05847/7	BH08/08 09/05847/8	BH08/09 09/05847/9	BH08/10 09/05847/10
				Client sampling date / time	27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00	27-MAY-2009 15:00
Compound	CAS Number	LOR	Unit		EB0908536-006	EB0908536-007	EB0908536-008	EB0908536-009	EB0908536-010
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		0.0001	<0.0001	0.0002	0.0002	0.0002
Lead	7439-92-1	0.001	mg/L		0.004	<0.001	<0.001	0.002	<0.001
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
1,4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)A: Phenolic Compounds									
2,4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%		99.8	97.5	97.5	96.8	99.0
Toluene-D8	2037-26-5	0.1	%		93.5	90.6	94.8	94.1	96.0
4-Bromofluorobenzene	460-00-4	0.1	%		89.3	90.5	90.0	89.4	90.6
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		37.6	33.0	36.2	61.2	41.8
2-Chlorophenol-D4	93951-73-6	0.1	%		89.9	85.9	82.0	103	103
2,4,6-Tribromophenol	118-79-6	0.1	%		106	95.7	109	106	113
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		103	98.6	109	112	106
Anthracene-d10	1719-06-8	0.1	%		100	95.6	102	104	107
4-Terphenyl-d14	1718-51-0	0.1	%		116	109	118	123	122

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 Client : BRISBANE CITY COUNCIL
 Project : WW 2805-1



Analytical Results

Sub-Matrix: WATER

				Client sample ID	DUPLICATE 09/05847/11	FIELD BLANK 09/05847/12	—	—	—
				Client sampling date / time	27-MAY-2009 15:00	27-MAY-2009 15:00	—	—	—
Compound	CAS Number	LOR	Unit	EB0908536-011	EB0908536-012	—	—	—	—
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	—	—	—	—
Lead	7439-92-1	0.001	mg/L	0.004	<0.001	—	—	—	—
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	5	µg/L	<5	<5	—	—	—	—
EP074F: Halogenated Aromatic Compounds									
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	—	—	—	—
EP075(SIM)A: Phenolic Compounds									
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	—	—	—	—
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	—	—	—	—
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	103	—	—	—	—
Toluene-D8	2037-26-5	0.1	%	93.6	98.3	—	—	—	—
4-Bromofluorobenzene	460-00-4	0.1	%	90.9	93.2	—	—	—	—
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	33.0	41.5	—	—	—	—
2-Chlorophenol-D4	93951-73-6	0.1	%	82.4	105	—	—	—	—
2,4,6-Tribromophenol	118-79-6	0.1	%	93.5	118	—	—	—	—
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	92.5	116	—	—	—	—
Anthracene-d10	1719-06-8	0.1	%	86.3	118	—	—	—	—
4-Terphenyl-d14	1718-51-0	0.1	%	99.3	137	—	—	—	—

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 Client : BRISBANE CITY COUNCIL
 Project : VVW 2805-1



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2,4,6-Tribromophenol	118-79-6	10	123
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

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