



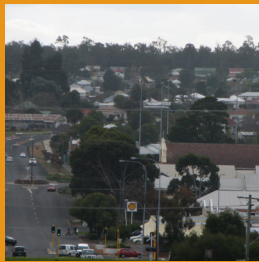
Department of
Environment and Conservation

Our environment, our future



Passive sampling of ambient concentrations of volatile organic compounds in Collie, Western Australia

Technical Report



October 2008

Acknowledgments

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- The Wellington District Department of Environment and Conservation in Collie for their assistance in field sampling, such as completing the Radiello cartridge and diffusive tube changeover in Collie, and relaying data to the Air Quality Management Branch. Special thanks to Drew Griffiths and his staff, particularly Fiona Kirkpatrick, Tiffany Fowler and Kyle Hulls.
- The Bureau of Meteorology for providing weather data during the sampling campaign.

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Executive summary

Volatile Organic Compounds (VOCs) – or air toxics – are a large group of air pollutants, some of which can be harmful to both the environment and human health. The first air toxics study in Collie was carried out by DEC in 2006 as part of developing the background air toxics monitoring program in Perth and selected regional areas of Western Australia.

After considering input from the community and other key stakeholders, a comprehensive monitoring program was instigated for VOCs in July 2007.

Monitoring concluded on 2 July, 2008.

The aims of the study were to:

- compile data on the levels of VOCs using passive samplers in and around Collie; and
- assess the measured levels of VOCs against the standards and guidelines set by the National Environment Protection (Air Toxics) Measure (NEPM).

The two sites that were chosen for sampling were the Coolangatta Industrial Estate (CIE), about seven kilometres north east of the Collie Township, and the second on River Avenue near the corner of Perrin Street, in the town and beside the Collie River.

The results derived from chemical analysis of samples indicate that:

- The four predominant VOCs were benzene, toluene, ethyl benzene and xylenes (BTEX) with most of the other 28 species measured recording below the Practical Quantitation Limit (PQL).
- The River Avenue site generally recorded much higher levels for the four predominant VOCs (BTEX) than the Coolangatta Industrial Estate site.
- Of the VOCs, toluene in week 11 at CIE was an exception recording the highest of any predominant VOCs for either site in this program.
- The measured compounds toluene, benzene, ethyl benzene and xylenes showed seasonal variation, with a higher concentration in cooler months, mainly autumn and winter. This accords with the previous study conducted in 2006 in the Collie area.

Definitions

Air NEPM National Environment (Ambient Air Quality) Protection Measure

Ambient air The external air environment does not include the air inside buildings or structures.

Blank (Field blank sample) An unexposed sampling medium used in an analytical procedure, in the absence of added analyte. The measured value of a field blank is the blank value and is set to 'zero' concentration of the measurements.

BTEX Benzene, Toluene, Ethyl benzene and Xylenes

DEC Department of Environment and Conservation

EA Environment Australia

µg/m³ Millionth of a gram per cubic metre of air

NEPC National Environment Protection Council

NEPM National Environment Protection Measure

Percentile For example, the 98th percentile means 98% of the data are less than or equal to the given value.

PQL Practical Quantitation Limit, also known as the Reporting Limit

VOCs Volatile Organic Compounds. Compounds with boiling points between 50 and 260 degrees Celsius that readily evaporate and are gases in ambient air.

WHO World Health Organisation

1.0 Introduction

As part of DEC's commitment to manage the air quality in key regional centres around Western Australia, the process for the development of an air quality strategy for Collie started in 2006. Collie was identified as a region of interest due to its growing importance as an industrial centre and its potential for industrial expansion.

An air quality management strategy ensures the ongoing maintenance of acceptable air quality in the Collie area while accommodating the impacts of current and future development.

The town of Collie ($-33^{\circ} 35' S$, $116^{\circ} 15' E$) situated in the south-west agricultural region of WA with a combination of mineral and energy based industries, has a population of about 9,000 people living in an area of 1,685 sq km.

Volatile organic compounds (VOCs) are gaseous, aerosol or particulate pollutants (other than the six criteria pollutants¹) which are present in the air at low concentrations. In addition to being photochemical smog precursors, some VOCs, particularly the so called 'air toxics' can pose significant risks to human health. Some of these are suspected carcinogens which are known to result in serious human health and/or environmental effects (OECD, 1995; WHO, 1987).

There has previously been limited periodic monitoring for VOCs in Collie. DEC instigated a comprehensive monitoring program for VOCs in mid 2007, which continued for 12 months at two sites in Collie.

¹ 'Criteria air pollutants' is a term used internationally to describe air pollutants that have been regulated and are used as indicators of air quality. Australia has set national standards for six criteria air pollutants in outdoor (or ambient) air: carbon monoxide, lead, nitrogen dioxide, ozone, particles and sulphur dioxide.

The aim of this study was to monitor and assess concentration of selected VOCs in Collie for a range of purposes, including assessment against relevant air quality guidelines and to assess the spatial variation in concentration. This report provides findings and assessment of the field measurements of VOCs.

2.0 Sampling Site Locations

VOCs monitoring was carried out at two sites located at River Avenue and the Coolangatta Industrial Estate (CIE). The location of sampling sites is shown in Figure 1. River Avenue sits beside the Collie River in the town of Collie. The site is north-east of the town centre. It is in a residential area and would potentially receive impacts of domestic wood heating and vehicular emissions being so close to the road and surrounded by housing. (Figure 2a).

The CIE site is located seven kilometres north-east of Collie, on the outskirts of the Bluewaters power station, and was used as a background measurement site for the purpose of this study.

The location of the CIE site monitoring station has been moved on two occasions. The first move of the sampling station was on the 26 September 2007, due to construction of a car park by the Griffin Coal Group. The site was moved about 80 metres south to an open wooded area. The Radiello passive sampler was fixed to a wooden pole at this site. The station was moved for the second time on 21 November, about 10 metres west to a more appropriate location on a tree, as the wooden pole the sampler was fixed to was deemed unsuitable due to its instability when the sampler tubes were being changed.

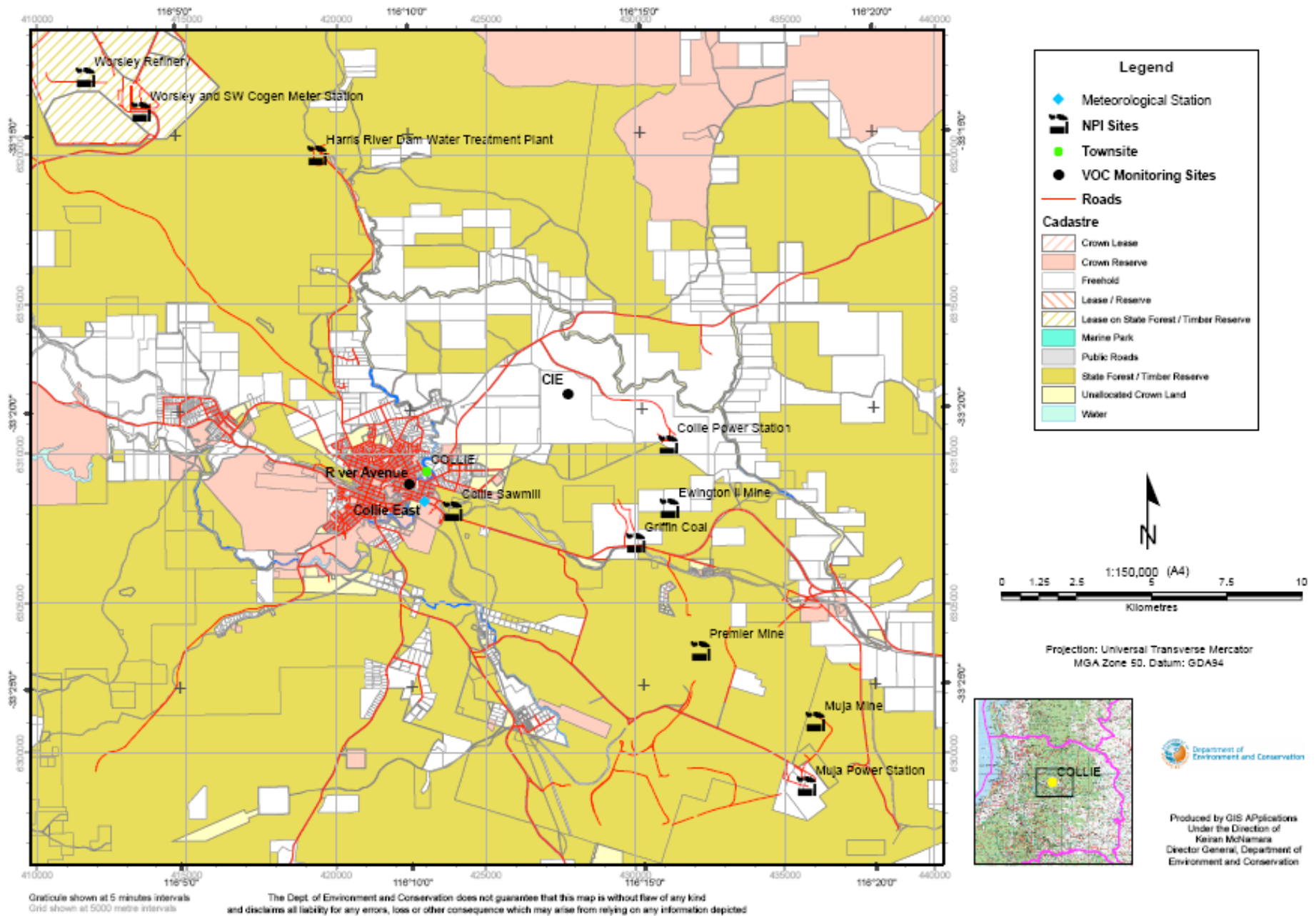


Figure 1 The Collie area showing the NPI reporting facilities, Collie East meteorological station and location of VOCs monitoring sites



Figure 2a River Avenue site facing north-east with a Radiello shelter fitted to the power pole on the left



Figure 2b Coolangatta Industrial Estate site

3.0 Sampling method

The monitoring program used Radiello sampling tubes (Figure 3), a passive sampling method, where components move onto the adsorbent by the process of diffusion. The tubes were exchanged every week, providing a seven-day average of the VOCs' concentration for the measurement sites. Samples were sent to Leeder Consulting for laboratory identification of VOCs. Before starting sampling, field officers were instructed in the use of the passive samplers, sample collection and sample transport protocol. Passive samplers were chosen for their flexibility and ease of use. These samplers do not require electrical power and were housed in small containers that can be mounted onto power poles or similar structures at any location. Passive sampling provides a screening level of monitoring, confirming which substances are present and providing an estimation of pollutant concentration over seven-days. The information will be used to plan future investigations if warranted.

The notable downfalls of the use of passive samplers is that they cannot assess short term concentrations precisely and cannot indicate when fluctuations in pollutions levels occur on a daily or hourly basis. However, this sampling method provides a time weighted average concentration of the pollutants measured.



Figure 3 Three dimensional image of a Radiello passive tube

4.2 Exposure time for Radiello sampling tubes

The average exposure time for the Radiello tubes is an important factor in taking accurate measurements of VOCs over the course of the study. Figure 4 displays the sampling timeframes during the year of the study. Forty eight samples were taken over the year, as some samples were exposed for more than seven days.

It can be seen that after a fluctuation in exposure time between weeks eight and sixteen (due to logistical reasons) there were more consistent sampling on a weekly basis. The time of exposure for samples one to forty-eight averages 10,622 minutes, which is marginally more than a week of exposure per tube (one week being 10,080 minutes).

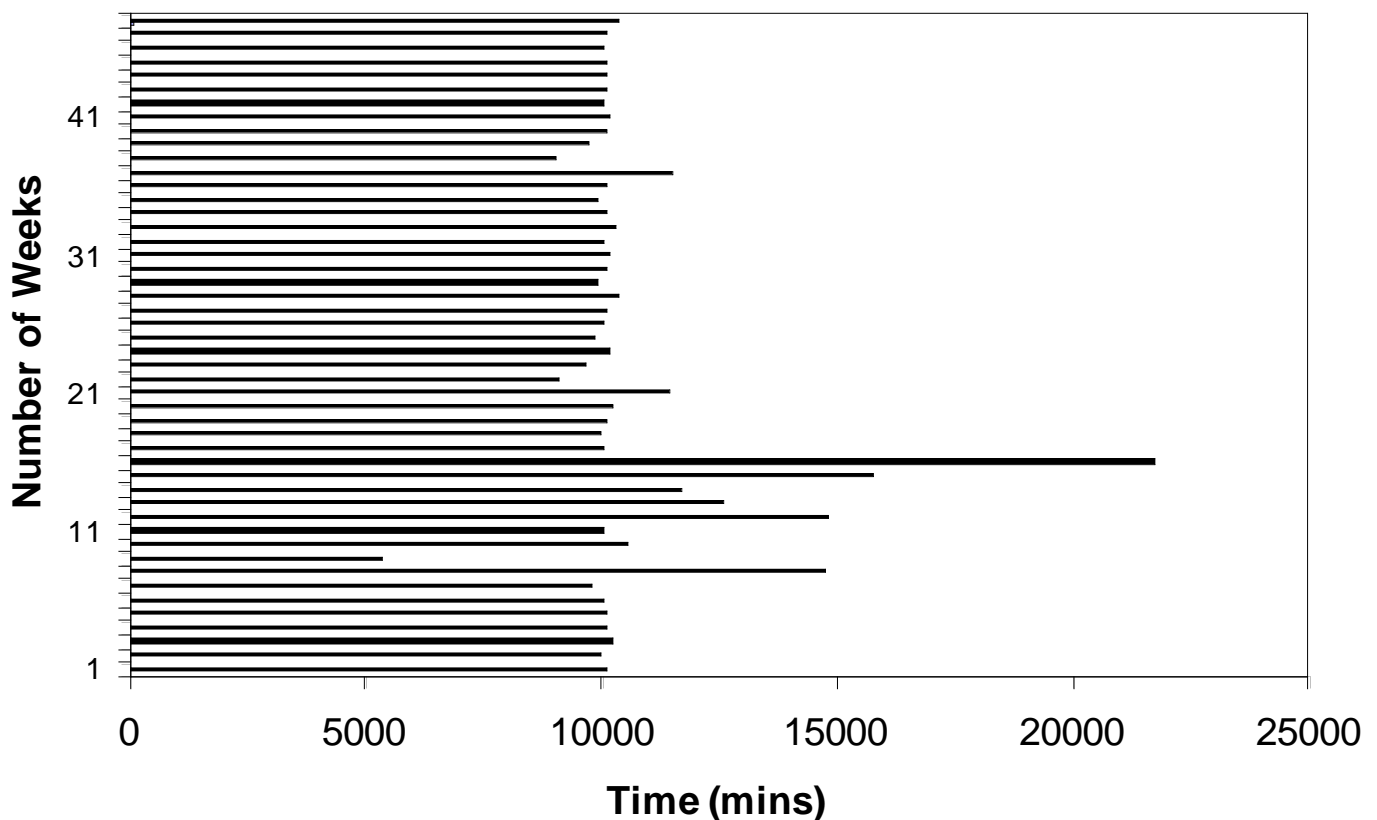


Figure 4 Exposure times of Radiello tubes at Collie during sampling (13 July 2007 – 2 July 2008)

4.3 VOCs concentration during the sampling period (13 July 2007 – 2 July 2008)

Ninety six VOCs samples (from both CIE and River Avenue sites) were taken throughout the sampling period.

On a seven-day average period at both sampling sites, the passive samplers were constantly able to detect compounds benzene (C₆H₆), toluene (C₇H₈), ethyl benzene (C₈H₁₀) and xylenes (C₈H₁₀), which are commonly linked to vehicle-related and wood heating emissions.

4.3.1 Compounds below Practical Quantitation Limit (PQL)

Table 2 reports the percentage of observations below the Practical Quantitation Limit (PQL).

Twenty-four of the 32 compounds were less than the PQL in all of the samples collected with benzene, toluene, ethyl benzene and xylenes being predominant.

Table 2 Percentage of samples received with concentrations below the reporting limit

<i>Compound</i>	<i>Percentage of samples (%)</i>	
	River Avenue	Coolangatta Industrial Estate
Benzene	61	77
Bromochloromethane	100	100
Butanol	100	100
2-butoxyethanol	100	100
Butyl acetate	98	100
Cyclohexane	100	100
Cyclohexanone	100	100
n-decane	100	100
1,2-Dichloropropane	100	100
Ethyl acetate	100	100
Ethyl benzene	71	83
Ethyl-ter-butyl ether	100	100
n-Heptane	100	100
n-Hexane	94	100
Isobutanol	100	100
Isooctane	98	100
Isopropylbenzene	96	100
1-Methoxy-2-propanol	100	100
1-Methoxy-2-propyl acetate	100	100
Methyl methacrylate	100	100
Methylethylketone	100	100
Methylisobutylketone	100	100
2-Methylpentane	100	100
3-Methylpentane	100	100
Methyl-ter-butyl ether	100	100
N-Octane	100	100
Styrene	100	100
Tetrachloroethylene	100	100
Toluene	4	31
1,1,1-Trichloroethane	100	100
Trichloroethylene	100	100
Xylenes	42	67

4.3.2 Comparison with Air Toxics National Environment Protection Measure (NEPM)

In December 2004, the National Environment Protection Council (NEPC) introduced the National Environment Protection (Air Toxics) Measure (known as the “Air Toxics NEPM”) which establishes ‘monitoring investigation levels’ for the following five air toxics:

(1) Benzene (2) Formaldehyde (3) Benzo(a)pyrene as a marker for Polycyclic Aromatic Hydrocarbons (4) Toluene and (5) Xylenes (as total of ortho, meta and para isomers).

The investigation limit is a guide to assessing levels of air toxics. The NEPM states an annual average of 10.4 $\mu\text{g}/\text{m}^3$ for benzene, 411 $\mu\text{g}/\text{m}^3$ for toluene and 952 $\mu\text{g}/\text{m}^3$ for xylenes. The annual average for ethyl benzene is currently 22,000 $\mu\text{g}/\text{m}^3$, based on the World Health Organisation (WHO) standard.

The weekly concentrations of benzene, toluene, ethyl benzene and xylenes at River Avenue and Coolangatta Industrial Estate are shown in Figures 5 and 6 respectively. The results of the year of testing, show none of the VOCs exceeded the investigation levels for the Air Toxics NEPM.

The highest annual average value that was recorded in relation to the NEPM guidelines was for benzene at River Avenue, with 8 per cent of the annual NEPM guideline of 10.4 $\mu\text{g}/\text{m}^3$ (Figure 5). All other compounds recorded an annual average less than 1per cent of the NEPM and WHO standards.

4.3.3 Summary of percentile statistics

Summary percentile statistics for benzene, toluene, ethyl benzene and xylenes monitored during the sampling period at the CIE and River Avenue sites are presented in Tables 3 and 4 respectively. Before the summary statistics were calculated, samples that were found to be under reporting limit were halved².

It can be seen from Tables 3 and 4 that the concentration of benzene, toluene, ethyl benzene and xylenes at River Avenue and CIE sites are very low. It can also be seen that:

- Benzene, toluene, ethyl benzene and xylenes have a 95th percentile that is less than 2.5 µg/m³.
- None of the chemicals measured a concentration over 5 µg/m³.

Table 3 Percentiles (µg/m³) from passive monitoring at CIE site

Percentiles									
	MIN	5	25	50	75	90	95	99	MAX
Benzene	0.03	0.04	0.06	0.07	0.08	0.19	0.33	1.81	1.90
Toluene	0.06	0.07	0.07	0.24	0.35	0.50	0.90	2.78	4.00
Xylenes	0.04	0.05	0.08	0.08	0.18	0.29	0.44	0.65	0.80
Ethylbenzene	0.04	0.05	0.08	0.08	0.08	0.16	0.21	0.24	0.24

Table 4 Percentiles (µg/m³) from passive monitoring at River Ave site

Percentiles									
	MIN	5	25	50	75	90	95	99	MAX
Benzene	0.03	0.05	0.06	0.36	1.45	2.13	2.20	2.51	2.70
Toluene	0.07	0.10	0.41	0.72	1.43	1.93	2.20	2.30	2.30
Xylenes	0.07	0.07	0.08	0.28	0.78	1.03	1.33	1.51	1.60
Ethylbenzene	0.04	0.06	0.08	0.08	0.20	0.28	0.36	0.39	0.40

²PQL results were halved due to the fact the concentration could be between zero and the recorded PQL, and a result was necessary to find statistical outcomes.

4.3.4 Seasonal differences

The weekly concentration of benzene, toluene, ethyl benzene and xylenes at the Coolangatta Industrial Estate and River Avenue sites are shown in Figures 5 and 6 respectively, for the sampling period.

It can be seen from Figures 5 and 6 that River Avenue consistently recorded higher levels of benzene, toluene, ethyl benzene and xylenes than that of CIE.

It can be seen in Figure 5 that benzene, toluene, ethyl benzene and xylenes at River Avenue show the highest concentration in the cooler time of the year, being the end of autumn, winter and start of spring. The likely cause of increased concentration in winter could be the use of domestic wood heating³ in Collie. These findings accord with the previous study carried out in Collie by DEC in 2007⁴.

Figure 6 shows that the levels of benzene, toluene, ethyl benzene and xylenes in week 10 and week 17, when the CIE station was relocated, are not significantly different to the other weeks. The exception is the toluene level in week 11, which is elevated. It has yet to be determined if this is a related issue.

³ DEC undertook a major review of the wood heater use in the Collie area in 2006 as part of the Synovate PTY LTD Survey. The survey revealed that wood heaters are the most prevalent form of home heating in Collie, with 93 per cent of the surveyed homes having a type of wood heater (e.g. pot belly, open-fire place, slow combustion etc.). *Synovate 2006*.

⁴ http://portal.environment.wa.gov.au/portal/page?_pageid=54,6556605&_dad=portal&_schema=PORTAL

4.3.5 Comparison with other Studies

DEC conducted passive sampling for VOCs in Collie from April 2006 – April 2007.

The study used four sites:

- Hunter St (HU)
- Gavan St (GA)
- Corner of Burt and Wittenoom St (BW)
- Corner of Mary and Atkinson St (MA).

The sites used were not the same as those in the current study and so results cannot be directly compared, but an indicative comparison can be made.

Figure 7 compares annual average concentrations for benzene, toluene, ethyl benzene and xylenes for the 2006-07 study, and the recently completed 2007-08 study. The annualised data was compiled using seven-day averaged concentrations.

Benzene, toluene, ethyl benzene and xylenes results from this study were lower than those in the 2006-07 study.

The annual average concentrations of benzene, toluene, ethyl benzene and xylenes for 2006-07 and 2007-08 are seen in Figure 7 and Table 5. The results show the 2006-07 study had higher levels than the averages presented by the 2007-08 study.

Table 5 Annual average concentration for predominant VOCs in 2007-08 compared to the measurements made in Collie in 2006-07

Compound	2006-07 ($\mu\text{g}/\text{m}^3$)	2007-08 ($\mu\text{g}/\text{m}^3$)
Benzene	1.14	0.49
Toluene	1.2	0.64
Ethylbenzene	0.2	0.12
Xylenes	0.53	0.3

5.0 Conclusions and recommendations

VOCs sample collection was conducted using Radiello passive samplers which were left in the field and exposed to ambient conditions for a seven-day period. Sampling ran across two sites between 13 of July 2007 and 2 of July 2008. Leeder Consulting analysed the Radiello samples.

Key findings from the study are listed below:

- Over a seven-day averaging period at both sites the only constantly detected compounds were benzene, toluene, ethyl benzene and xylenes. Most other compounds were significantly below the Practical Quantitation Limit results (PQL).
- None of the pollutants exceeded the Air NEPM guideline levels at any time during the sampling campaign.
- Benzene recorded the highest seven-day concentration at the River Avenue site of 2.7 $\mu\text{g}/\text{m}^3$. Toluene recorded the highest annual average concentration of 0.93 $\mu\text{g}/\text{m}^3$ at River Avenue.
- Benzene recorded the highest annual average value in relation to the NEPM guidelines with 8 per cent of the annual NEPM guideline of 10.4 $\mu\text{g}/\text{m}^3$, at the River Avenue site.
- Measured VOCs exhibited seasonal variation, with the highest concentrations observed in the cooler periods of the year.

Looking at current data and trends, use of wood heating during the winter months seems to be a major influence in the increase in VOC levels, and this may need addressing in the future.

6.0 Bibliography

Adeeb, F. Johnston, D. and Cope, M. 2004, *Atmospheric mono-aromatic hydrocarbons and aldehydes in Adelaide, South Australia*, Proceedings of 17th International Clean Air and Environment Conference, Hobart, Tasmania.

Chung, KC. Stock, TH. Morandi, MT. and Afshar, M. 2004, *Evaluation and use of diffusive air samplers for determining temporal and spatial variation of volatile organic compounds in the ambient air of urban communities*, Proceedings of the 97th Annual Conference of the Air and Waste Management Association, June 2004, Indianapolis, Indiana, USA.

Cocheo, V. Sacco, P. Boaretto, C. DeSaeger, E. Perez Ballesta, P. Skov, H. Goelen, E. Gonzalez, N. and Baeze Caracena, A. 2000, *Urban Benzene Pollution and Population Exposure*, Nature 404 141-142 pp1-6.

Department of Environment and Conservation (DEC) 2007, *Midland background air quality study (MBAQS) Pilot trial report*, July 2007.

Hollander, M. and Wolfe, DA. 1999, *Nonparametric Statistical Methods*, John Wiley and Sons, New York, 787 pp.

NEPC 2004, *National Environmental Protection (Air Toxics) Measure Explanatory Document*. National Environmental Protection Council April 2004, 27p

OECD 1995, *Control of Hazardous Air Pollutants in OECD Countries*, Organisation for Economic Cooperation and Development (OECD), Paris.

WHO 1987, *Air Quality Guidelines for Europe*, World Health Organisation, WHO Regional Publications, European Series No. 23, Copenhagen.

Synovate 2006, *Home Heating Survey*, Department of Environment and Conservation, Perth.

Websites

- http://www.radiello.it/english/cov_chim_en.htm
- http://www.ephc.gov.au/nepms/air/air_toxics.html
- <http://www.environment.gov.au/atmosphere/airquality/pollutants.html>

Appendix A

VOCs data

M071216 6/09/2007	Date=	13/07-20/07		20/07-27/07		27/07-3/08		3/08-10/08	
Laboratory ID =>		2007014532	2007014533	2007014535	2007014536	2007014537	2007014538	2007014539	2007014540
Sample Description =>		CIE T132B	River Avenue T226B	CIE T228B	River Avenue T129B	CIE T133B	River Avenue T134B	CIE T138B	River Avenue T140B
Parameter	Units								
Benzene	µg/m ³	<0.13	2.2	<0.13	1.1	<0.13	0.97	<0.13	1.3
Bromochloromethane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Butanol	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.15	<0.14	<0.14	<0.14
2-butoxyethanol	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Butyl acetate	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.18	<0.18
Cyclohexane	µg/m ³	<0.2	<0.2	<0.2	<0.2	<0.2	<0.19	<0.2	<0.2
Cyclohexanone	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.15	<0.16	<0.16
n-decane	µg/m ³	<0.25	<0.25	<0.25	<0.25	<0.25	<0.24	<0.25	<0.25
1,2-Dichloropropane	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl acetate	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.13	<0.14	<0.14
Ethyl benzene	µg/m ³	<0.16	0.19	<0.16	<0.16	<0.16	<0.15	<0.16	<0.16
Ethyl-ter-butyl ether	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.18	<0.17	<0.17	<0.17
n-Heptane	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.18	<0.18	<0.18
n-Hexane	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Isobutanol	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Isooctane	µg/m ³	<0.19	<0.19	<0.2	<0.2	<0.2	<0.19	<0.19	<0.19
Isopropylbenzene	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.18	<0.18	<0.18
1-Methoxy-2-propanol	µg/m ³	<0.19	<0.19	<0.2	<0.2	<0.2	<0.19	<0.19	<0.19
1-Methoxy-2-propyl acetate	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.18	<0.18
Methyl methacrylate	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.15	<0.16	<0.16
Methylethylketone	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.14	<0.13	<0.13	<0.13
Methylisobutylketone	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
2-Methylpentane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
3-Methylpentane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.16
N-Octane	µg/m ³	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Styrene	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.18	<0.17	<0.17	<0.17
Tetrachloroethylene	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Toluene	µg/m ³	0.32	1.9	<0.15	0.7	<0.15	0.65	<0.14	1.2
1,1,1-Trichloroethane	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Trichloroethylene	µg/m ³	<0.15	<0.15	<0.16	<0.16	<0.16	<0.15	<0.15	<0.15
Xylenes	µg/m ³	<0.16	0.68	<0.16	<0.16	<0.16	<0.15	<0.16	<0.16

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M071441 3/10/2007	Date=	10/08-17/08		17/08-24/08		24/08-31/08		31/08-10/09	
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Sample Description =>		CIE T418B	River Avenue T419B	CIE T724P	River Avenue T725P	CIE T423B	River Avenue T425B	CIE T428B	River Avenue T430B
Parameter	Units								
n-Hexane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.15	<0.1	0.82
Xylenes	µg/m ³	<0.15	0.81	<0.15	0.58	<0.15	0.26	0.1	0.77
Trichloroethylene	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
1,1,1-Trichloroethane	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.17	<0.16	<0.11	<0.11
Toluene	µg/m ³	0.29	1.7	0.35	1.3	0.22	0.75	0.33	1.6
Tetrachloroethylene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.11	<0.11
Styrene	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.17	<0.17	<0.11	<0.11
N-Octane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.13	<0.13
Methyl-ter-butyl ether	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.16	<0.1	<0.1
3-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
2-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
Methylisobutylketone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.1	<0.1
Methylethylketone	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.09	<0.09
Methyl methacrylate	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.1	<0.1
1-Methoxy-2-propyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.11	<0.11
1-Methoxy-2-propanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.19	<0.19	<0.12	<0.12
Isopropylbenzene	µg/m ³	<0.2	0.21	<0.2	0.15	<0.2	<0.2	<0.1	0.21
Isooctane	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.19	<0.19	<0.12	<0.12
1,2-Dichloropropane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.15	<0.1	<0.1
Ethyl acetate	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.09	<0.09
Isobutanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.09	<0.09
Ethyl benzene	µg/m ³	<0.15	0.23	<0.15	0.15	<0.15	<0.15	<0.1	0.2
Ethyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.17	<0.17	<0.11	<0.11
n-Heptane	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.18	<0.18	<0.12	<0.12
Butyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.11	0.38
Benzene	µg/m ³	<0.12	1.9	<0.12	1.2	<0.13	0.82	0.1	1.7
Bromochloromethane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
n-decane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.1	<0.1
Cyclohexanone	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.12	<0.12
Butanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.14	<0.14	<0.09	<0.09
Cyclohexane	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.19	<0.19	<0.13	<0.13
2-butoxyethanol	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.18	<0.18	<0.12	<0.12

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M071620	Date=	10/09-14/09		14/09-21/09		21/09-28/09		28/09-9/10	
1/11/2007									
Laboratory ID =>		2007019924	2007019925	2007019926	2007019927	2007019928	2007019929	2007019930	2007019931
Sample Description =>		CIE T434B	River Avenue T435B	CIE X338M	River Avenue X340M	CIE Z763W	River Avenue Z767W	CIE Z779J	River Avenue Z766J
Parameter	Units								
Benzene	µg/m ³	<0.23	1.3	<0.12	1.7	<0.12	1.2	<0.08	1
Bromochloromethane	µg/m ³	<0.27	<0.27	<0.14	<0.14	<0.14	<0.14	<0.09	<0.09
Butanol	µg/m ³	<0.25	<0.25	<0.13	<0.13	<0.13	<0.14	<0.09	<0.09
2-butoxyethanol	µg/m ³	<0.33	<0.34	<0.17	<0.17	<0.18	<0.18	<0.11	<0.11
Butyl acetate	µg/m ³	<0.31	<0.31	<0.16	<0.16	<0.17	<0.17	<0.1	<0.1
Cyclohexane	µg/m ³	<0.35	<0.35	<0.18	<0.18	<0.18	<0.19	<0.12	<0.12
Cyclohexanone	µg/m ³	<0.28	<0.28	<0.14	<0.14	<0.15	<0.15	<0.09	<0.09
n-decane	µg/m ³	<0.44	<0.44	<0.22	<0.22	<0.23	<0.23	<0.15	<0.15
1,2-Dichloropropane	µg/m ³	<0.28	<0.28	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
Ethyl acetate	µg/m ³	<0.24	<0.24	<0.12	<0.12	<0.13	<0.13	<0.08	<0.08
Ethyl benzene	µg/m ³	<0.28	<0.28	<0.14	0.14	0.23	<0.15	<0.09	0.11
Ethyl-ter-butyl ether	µg/m ³	<0.31	<0.31	<0.16	<0.16	<0.16	<0.16	<0.1	<0.1
n-Heptane	µg/m ³	<0.32	<0.32	<0.16	<0.16	<0.17	<0.17	<0.11	<0.11
n-Hexane	µg/m ³	<0.28	<0.28	<0.14	<0.14	<0.15	<0.15	<0.1	<0.1
Isobutanol	µg/m ³	<0.24	<0.24	<0.12	<0.12	<0.13	<0.13	<0.08	<0.08
Isooctane	µg/m ³	<0.34	<0.34	<0.17	<0.17	<0.18	<0.18	<0.11	<0.11
Isopropylbenzene	µg/m ³	<0.32	<0.32	<0.16	<0.16	<0.17	<0.17	<0.11	<0.11
1-Methoxy-2-propanol	µg/m ³	<0.34	<0.34	<0.17	<0.17	<0.18	<0.18	<0.11	<0.11
1-Methoxy-2-propyl acetate	µg/m ³	<0.31	<0.31	<0.16	<0.16	<0.17	<0.17	<0.1	<0.1
Methyl methacrylate	µg/m ³	<0.28	<0.28	<0.14	<0.14	<0.15	<0.15	<0.09	<0.09
Methylethylketone	µg/m ³	<0.24	<0.24	<0.12	<0.12	<0.13	<0.13	<0.08	<0.08
Methylisobutylketone	µg/m ³	<0.28	<0.28	<0.14	<0.14	<0.15	<0.15	<0.09	<0.09
2-Methylpentane	µg/m ³	<0.27	<0.27	<0.14	<0.14	<0.14	<0.14	<0.09	<0.09
3-Methylpentane	µg/m ³	<0.27	<0.27	<0.14	<0.14	<0.14	<0.14	<0.09	<0.09
Methyl-ter-butyl ether	µg/m ³	<0.29	<0.29	<0.15	<0.15	<0.15	<0.15	<0.1	<0.1
N-Octane	µg/m ³	<0.35	<0.35	<0.18	<0.18	<0.19	<0.19	<0.12	<0.12
Styrene	µg/m ³	<0.31	<0.31	<0.16	<0.16	<0.16	<0.16	<0.1	<0.1
Tetrachloroethylene	µg/m ³	<0.32	<0.32	<0.16	<0.16	<0.17	<0.17	<0.11	<0.11
Toluene	µg/m ³	0.51	2.2	0.33	1.2	4	0.95	0.32	0.89
1,1,1-Trichloroethane	µg/m ³	<0.3	<0.3	<0.15	<0.15	<0.16	<0.16	<0.1	<0.1
Trichloroethylene	µg/m ³	<0.27	<0.27	<0.14	<0.14	<0.14	<0.15	<0.09	<0.09
Xylenes	µg/m ³	<0.27	0.59	<0.14	0.55	0.37	0.31	<0.09	0.42

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M071818 5/12/2007	Date=	9/10-18/10		18/10-26/10		26/10-6/11		6/11-21/11	
Laboratory ID =>		2007022168	2007022169	2007022170	2007022171	2007022172	2007022173	2007022174	2007022175
Sample Description		CIE T728P	River Avenue T731P	CIE Z768J	River Avenue Z770J	CIE T734P	River Avenue T736P	CIE Z774J	River Avenue Z776J
Parameter	Units								
Benzene	µg/m ³	<0.1	<0.1	<0.11	<0.11	<0.08	<0.08	<0.06	<0.06
Bromochloromethane	µg/m ³	<0.11	<0.11	<0.12	<0.12	<0.09	<0.09	<0.07	<0.07
Butanol	µg/m ³	<0.11	<0.11	<0.12	<0.12	<0.09	<0.09	<0.06	<0.06
2-butoxyethanol	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.11	<0.11	<0.08	<0.08
Butyl acetate	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.11	<0.11	<0.08	<0.08
Cyclohexane	µg/m ³	<0.15	<0.15	<0.16	<0.16	<0.12	<0.12	<0.09	<0.09
Cyclohexanone	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.09	<0.09	<0.07	<0.07
n-decane	µg/m ³	<0.18	<0.19	<0.2	<0.2	<0.15	<0.15	<0.11	<0.11
1,2-Dichloropropane	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.1	<0.1	<0.07	<0.07
Ethyl acetate	µg/m ³	<0.1	<0.1	<0.11	<0.11	<0.08	<0.08	<0.06	<0.06
Ethyl benzene	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.09	<0.09	<0.07	<0.07
Ethyl-ter-butyl ether	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.1	<0.1	<0.08	<0.08
n-Heptane	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.11	<0.11	<0.08	<0.08
n-Hexane	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.1	<0.1	<0.07	<0.07
Isobutanol	µg/m ³	<0.1	<0.1	<0.11	<0.11	<0.08	<0.08	<0.06	<0.06
Isooctane	µg/m ³	<0.14	<0.14	<0.16	<0.16	<0.12	<0.12	<0.08	<0.08
Isopropylbenzene	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.11	<0.11	<0.08	<0.08
1-Methoxy-2-propanol	µg/m ³	<0.14	<0.14	<0.16	<0.16	<0.12	<0.12	<0.08	<0.08
1-Methoxy-2-propyl acetate	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.11	<0.11	<0.08	<0.08
Methyl methacrylate	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.09	<0.09	<0.07	<0.07
Methylethylketone	µg/m ³	<0.1	<0.1	<0.11	<0.11	<0.08	<0.08	<0.06	<0.06
Methylisobutylketone	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.09	<0.09	<0.07	<0.07
2-Methylpentane	µg/m ³	<0.11	<0.11	<0.12	<0.12	<0.09	<0.09	<0.07	<0.07
3-Methylpentane	µg/m ³	<0.11	<0.11	<0.12	<0.12	<0.09	<0.09	<0.07	<0.07
Methyl-ter-butyl ether	µg/m ³	<0.12	<0.12	<0.13	<0.13	<0.1	<0.1	<0.07	<0.07
N-Octane	µg/m ³	<0.15	<0.15	<0.16	<0.16	<0.12	<0.12	<0.09	<0.09
Styrene	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.1	<0.1	<0.08	<0.08
Tetrachloroethylene	µg/m ³	<0.13	<0.13	<0.15	<0.15	<0.11	<0.11	<0.08	<0.08
Toluene	µg/m ³	0.21	1.1	0.35	0.74	0.24	0.6	0.16	0.57
1,1,1-Trichloroethane	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.1	<0.1	<0.07	<0.07
Trichloroethylene	µg/m ³	<0.12	<0.12	<0.12	<0.12	<0.09	<0.09	<0.07	<0.07
Xylenes	µg/m ³	<0.12	0.45	<0.13	0.29	<0.09	0.27	<0.07	0.24

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M071993 11/01/2008	Date=	21/11-28/11		28/11-5/12		5/12-12/12		12/12-19/12	
Laboratory ID =>		2007024440	2007024442	2007024443	2007024444	2007024445	2007024446	2007024447	2007024448
Sample Description		CIE O835J	River Avenue O837J	CIE X022Z	River Avenue X019Z	CIE Z706J	River Avenue Z708J	CIE O952G	River Avenue O954G
Parameter	Units								
Benzene	µg/m ³	<0.12	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.12
Bromochloromethane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Butanol	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.13	<0.13	<0.13	<0.13
2-butoxyethanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
Butyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
Cyclohexane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18	<0.18	<0.18
Cyclohexanone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
n-decane	µg/m ³	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
1,2-Dichloropropane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Ethyl acetate	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Ethyl benzene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
Ethyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Heptane	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
n-Hexane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Isobutanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isooctane	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Isopropylbenzene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1-Methoxy-2-propanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1-Methoxy-2-propyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
Methyl methacrylate	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
Methylethylketone	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.12	<0.12
Methylisobutylketone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
2-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
3-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl-ter-butyl ether	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
N-Octane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18
Styrene	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Tetrachloroethylene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Toluene	µg/m ³	0.19	0.43	<0.14	0.46	0.27	0.54	0.24	0.58
1,1,1-Trichloroethane	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloroethylene	µg/m ³	<0.14	<0.15	<0.15	<0.15	<0.14	<0.14	<0.14	<0.14
Xylenes	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.15	<0.14	<0.14

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M080090 4/02/2008	Date=	19/12-27/12		27/12-2/01		2/01-09/01		9/01-16/01	
		2008001049 CIE O958G	2008001050 River Avenue O961G	2008001051 CIE R277Q	2008001053 River Avenue X795S	2008001054 CIE Y591P	2008001055 River Avenue Y590P	2008001056 CIE Y589P	2008001057 River Avenue Y592P
Laboratory ID =>									
Sample Description									
Parameter	Units								
Benzene	µg/m ³	<0.11	<0.11	<0.14	<0.14	<0.13	<0.13	<0.12	<0.12
Bromochloromethane	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
Butanol	µg/m ³	<0.12	<0.12	<0.15	<0.15	<0.14	<0.14	<0.13	<0.13
2-butoxyethanol	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.18	<0.18	<0.18	<0.18
Butyl acetate	µg/m ³	<0.15	<0.15	<0.18	<0.18	<0.17	<0.17	<0.16	<0.16
Cyclohexane	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.19	<0.19	<0.18	<0.18
Cyclohexanone	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
n-decane	µg/m ³	<0.2	<0.2	<0.26	<0.26	<0.24	<0.24	<0.23	<0.23
1,2-Dichloropropane	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15	<0.15
Ethyl acetate	µg/m ³	<0.11	<0.11	<0.14	<0.14	<0.13	<0.13	<0.13	<0.13
Ethyl benzene	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
Ethyl-ter-butyl ether	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16	<0.16
n-Heptane	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17	<0.17
n-Hexane	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15	<0.15
Isobutanol	µg/m ³	<0.11	<0.11	<0.14	<0.14	<0.13	<0.13	<0.13	<0.13
Isooctane	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.19	<0.19	<0.18	<0.18
Isopropylbenzene	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17	<0.17
1-Methoxy-2-propanol	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.19	<0.19	<0.18	<0.18
1-Methoxy-2-propyl acetate	µg/m ³	<0.15	<0.15	<0.18	<0.18	<0.17	<0.17	<0.16	<0.16
Methyl methacrylate	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
Methylethylketone	µg/m ³	<0.11	<0.11	<0.14	<0.14	<0.13	<0.13	<0.12	<0.12
Methylisobutylketone	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.15	<0.15	<0.15	<0.15
2-Methylpentane	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
3-Methylpentane	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
Methyl-ter-butyl ether	µg/m ³	<0.14	<0.14	<0.17	<0.17	<0.16	<0.16	<0.15	<0.15
N-Octane	µg/m ³	<0.17	<0.17	<0.21	<0.21	<0.2	<0.2	<0.19	<0.19
Styrene	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16	<0.16
Tetrachloroethylene	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17	<0.17
Toluene	µg/m ³	<0.12	0.5	<0.15	<0.15	<0.14	0.17	<0.13	<0.13
1,1,1-Trichloroethane	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16	<0.16
Trichloroethylene	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14
Xylenes	µg/m ³	<0.13	<0.13	<0.16	<0.16	<0.15	<0.15	<0.14	<0.14

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M080255 3/03/2008	Date=	16/01-23/01		23/01-30/01		30/01-6/02		6/02-13/02	
Laboratory ID =>		2008003213	2008003214	2008003215	2008003216	2008003217	2008003218	2008003220	2008003221
Sample Description		CIE Y593P	River Avenue Y594P	CIE Y598P	River Avenue Y597P	CIE Y599P	River Avenue Y601P	CIE X310X	River Avenue X311X
Parameter	Units								
Benzene	µg/m ³	<0.13	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Bromochloromethane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Butanol	µg/m ³	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
2-butoxyethanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
Butyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
Cyclohexane	µg/m ³	<0.19	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Cyclohexanone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
n-decane	µg/m ³	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
1,2-Dichloropropane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Ethyl acetate	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.12	<0.12
Ethyl benzene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
Ethyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Heptane	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
n-Hexane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Isobutanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isooctane	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Isopropylbenzene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1-Methoxy-2-propanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1-Methoxy-2-propyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
Methyl methacrylate	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
Methylethylketone	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.12	<0.12
Methylisobutylketone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
2-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
3-Methylpentane	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl-ter-butyl ether	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
N-Octane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18
Styrene	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Tetrachloroethylene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
Toluene	µg/m ³	0.22	0.19	<0.13	0.24	0.16	0.13	0.21	0.18
1,1,1-Trichloroethane	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloroethylene	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Xylenes	µg/m ³	<0.15	<0.15	<0.15	<0.15	0.26	<0.15	0.19	<0.14

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M080521 15/04/2008 Laboratory ID =>	Date=	13/02-20/02		20/02-27/02		27/02-5/03		5/03-12/03	
		(blank cells = No test request)		2008006864	2008006865	2008006866	2008006867	2008006868	2008006869
		2008006862	2008006863						
Parameter	Units	CIE Y418D	River Avenue Y419D	CIE Y420D	River Avenue Y422D	CIE T142O	River Avenue T143O	CIE X315X	River Avenue X318X
Benzene	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.12	<0.12	<0.13	<0.13
Bromochloromethane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14	<0.15	<0.15
Butanol	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.13	<0.13	<0.14	<0.14
2-butoxyethanol	µg/m ³	<0.18	<0.19	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Butyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.17
Cyclohexane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18	<0.19	<0.19
Cyclohexanone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
n-decane	µg/m ³	<0.24	<0.24	<0.24	<0.24	<0.23	<0.23	<0.24	<0.24
1,2-Dichloropropane	µg/m ³	<0.16	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Ethyl acetate	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Ethyl benzene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	0.15
Ethyl-ter-butyl ether	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.17
n-Heptane	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17	<0.18	<0.18
n-Hexane	µg/m ³	<0.16	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Isobutanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isooctane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18	<0.19	<0.19
Isopropylbenzene	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17	<0.18	<0.18
1-Methoxy-2-propanol	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18	<0.19	<0.19
1-Methoxy-2-propyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.17
Methyl methacrylate	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methylethylketone	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.12	<0.12	<0.13	<0.13
Methylisobutylketone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
2-Methylpentane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14	<0.15	<0.15
3-Methylpentane	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14	<0.15	<0.15
Methyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.15	<0.15	<0.16	<0.16
N-Octane	µg/m ³	<0.2	<0.2	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Styrene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.17
Tetrachloroethylene	µg/m ³	<0.18	<0.18	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Toluene	µg/m ³	<0.14	0.14	<0.14	<0.14	<0.13	0.16	<0.14	0.52
1,1,1-Trichloroethane	µg/m ³	<0.17	<0.17	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloroethylene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14	<0.15	<0.15
Xylenes	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14	0.23	0.53

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M080663 8/05/2008 Laboratory ID =>	Date=	12/03-19/03		19/03-26/03		26/03-2/04		2/04-9/04	
		(blank cells = No test request)		2008008619	2008008620	2008008621	2008008622	2008008623	2008008624
		2008008617	2008008618						
Parameter	Units	CIE T1470	River Avenue T1500	CIE T682P	River Avenue T684P	CIE T688P	River Avenue T689P	CIE T690P	River Avenue T693P
Benzene	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	0.21	0.65
Bromochloromethane	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Butanol	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
2-butoxyethanol	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.19	<0.19	<0.18	<0.18
Butyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.18	<0.18	<0.17	<0.17
Cyclohexane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.2	<0.2	<0.19	<0.19
Cyclohexanone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.16	<0.15	<0.15
n-decane	µg/m ³	<0.23	<0.23	<0.24	<0.24	<0.25	<0.25	<0.24	<0.24
1,2-Dichloropropane	µg/m ³	<0.15	<0.15	<0.15	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl acetate	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.14	<0.14	<0.13	<0.13
Ethyl benzene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.16	0.15	0.21
Ethyl-ter-butyl ether	µg/m ³	<0.16	<0.16	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
n-Heptane	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
n-Hexane	µg/m ³	<0.15	<0.15	<0.15	<0.16	<0.16	<0.16	<0.16	<0.16
Isobutanol	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.14	<0.14	<0.13	<0.13
Isooctane	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Isopropylbenzene	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1-Methoxy-2-propanol	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1-Methoxy-2-propyl acetate	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.18	<0.18	<0.17	<0.17
Methyl methacrylate	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.16	<0.15	<0.15
Methylethylketone	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Methylisobutylketone	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.16	<0.16	<0.15	<0.15
2-Methylpentane	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
3-Methylpentane	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methyl-ter-butyl ether	µg/m ³	<0.15	<0.15	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
N-Octane	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.2	<0.2	<0.2	<0.2
Styrene	µg/m ³	<0.16	<0.16	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethylene	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.18	<0.18	<0.18	<0.18
Toluene	µg/m ³	<0.14	0.68	0.33	0.47	0.4	0.26	0.5	1.3
1,1,1-Trichloroethane	µg/m ³	<0.16	<0.16	<0.16	<0.17	<0.17	<0.17	<0.17	<0.17
Trichloroethylene	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Xylenes	µg/m ³	<0.15	0.29	<0.15	<0.15	<0.15	<0.15	0.24	0.88

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M080839 2/06/2008		Date=	9/04-16/04		16/04-23/04		23/04-30/04		30/04-7/05		
Laboratory ID =>		(blank cells = No test request)		2008010889	2008010890	2008010891	2008010892	2008010893	2008010894	2008010895	2008010896
Sample Description =>		CIE Y919M	River Avenue Y921M	CIE Y925M	River Avenue Y927M	CIE T696P	River Avenue T698P	CIE Y426D	River Avenue Y428D		
Parameter	PQL	Units									
Benzene	0	µg/m ³	1.7	1.1	<0.15	1	0.14	1.4	0.4		2.7
Bromochloromethane	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15		<0.15
Butanol	0	µg/m ³	<0.12	<0.12	<0.16	<0.16	<0.15	<0.15	<0.14		<0.14
2-butoxyethanol	0	µg/m ³	<0.16	<0.16	<0.21	<0.21	<0.19	<0.19	<0.19		<0.19
Butyl acetate	0	µg/m ³	<0.15	<0.15	<0.2	<0.2	<0.18	<0.18	<0.18		<0.18
Cyclohexane	0	µg/m ³	<0.17	<0.17	<0.22	<0.22	<0.2	<0.2	<0.2		<0.2
Cyclohexanone	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.16		<0.16
n-decane	0	µg/m ³	<0.21	<0.21	<0.27	<0.27	<0.25	<0.25	<0.25		<0.25
1,2-Dichloropropane	0	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16		<0.16
Ethyl acetate	0	µg/m ³	<0.12	<0.12	<0.15	<0.15	<0.14	<0.14	<0.14		<0.14
Ethyl benzene	0	µg/m ³	0.24	0.24	<0.17	0.17	<0.16	0.22	0.19		0.4
Ethyl-ter-butyl ether	0	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17		<0.17
n-Heptane	0	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.19	<0.19	<0.18		<0.18
n-Hexane	0	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16		<0.16
Isobutanol	0	µg/m ³	<0.12	<0.12	<0.15	<0.15	<0.14	<0.14	<0.14		<0.14
Isooctane	0	µg/m ³	<0.17	<0.17	<0.21	<0.21	<0.2	<0.2	<0.19		<0.19
Isopropylbenzene	0	µg/m ³	<0.16	<0.16	<0.2	<0.2	<0.19	<0.19	<0.18		<0.18
1-Methoxy-2-propanol	0	µg/m ³	<0.17	<0.17	<0.21	<0.21	<0.2	<0.2	<0.19		<0.19
1-Methoxy-2-propyl acetate	0	µg/m ³	<0.15	<0.15	<0.2	<0.2	<0.18	<0.18	<0.18		<0.18
Methyl methacrylate	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.16		<0.16
Methylethylketone	0	µg/m ³	<0.12	<0.12	<0.15	<0.15	<0.14	<0.14	<0.13		<0.13
Methylisobutylketone	0	µg/m ³	<0.14	<0.14	<0.17	<0.17	<0.16	<0.16	<0.16		<0.16
2-Methylpentane	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15		<0.15
3-Methylpentane	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15		<0.15
Methyl-ter-butyl ether	0	µg/m ³	<0.14	<0.14	<0.18	<0.18	<0.17	<0.17	<0.16		<0.16
N-Octane	0	µg/m ³	<0.17	<0.17	<0.22	<0.22	<0.21	<0.21	<0.2		<0.2
Styrene	0	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17		<0.17
Tetrachloroethylene	0	µg/m ³	<0.15	<0.15	<0.2	<0.2	<0.18	<0.18	<0.18		<0.18
Toluene	0	µg/m ³	1.1	1.5	0.22	0.98	<0.15	1.3	0.43		2.2
1,1,1-Trichloroethane	0	µg/m ³	<0.15	<0.15	<0.19	<0.19	<0.18	<0.18	<0.17		<0.17
Trichloroethylene	0	µg/m ³	<0.13	<0.13	<0.17	<0.17	<0.16	<0.16	<0.15		<0.15
Xylenes	0	µg/m ³	0.48	0.93	<0.17	0.62	<0.16	0.79	0.49		1.4

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M081114	Date=	7/05-14/05	14/05-21/05	21/05-28/05	28/05-4/06					
3/07/2008										
Laboratory ID =>										
Sample Description =>										
Parameter	PQL	Units	CIE Y745N	River Avenue Y747N	CIE Y434D	River Avenue Y435D	CIE Q512R	River Avenue Y584D	River Avenue Q515R	CIE Y583D
Benzene	0	µg/m ³	0.18	2.1	0.21	1.8	0.16	2.3	1.6	0.13
Bromochloromethane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Butanol	0	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
2-butoxyethanol	0	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Butyl acetate	0	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.17	<0.17	<0.18	<0.18
Cyclohexane	0	µg/m ³	<0.19	<0.19	<0.2	<0.2	<0.19	<0.19	<0.19	<0.19
Cyclohexanone	0	µg/m ³	<0.15	<0.15	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15
n-decane	0	µg/m ³	<0.24	<0.24	<0.25	<0.25	<0.24	<0.24	<0.24	<0.24
1,2-Dichloropropane	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl acetate	0	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.13	<0.13	<0.13	<0.13
Ethylbenzene	0	µg/m ³	<0.15	0.36	0.16	0.25	<0.15	0.37	0.28	<0.15
Ethyl-ter-butyl ether	0	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
n-Heptane	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
n-Hexane	0	µg/m ³	<0.16	4.7	<0.16	<0.16	<0.16	0.35	<0.16	<0.16
Isobutanol	0	µg/m ³	<0.13	<0.13	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Isooctane	0	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Isopropylbenzene	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1-Methoxy-2-propanol	0	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1-Methoxy-2-propyl acetate	0	µg/m ³	<0.17	<0.17	<0.18	<0.18	<0.17	<0.17	<0.18	<0.18
Methyl methacrylate	0	µg/m ³	<0.15	<0.15	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15
Methylethylketone	0	µg/m ³	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Methylisobutylketone	0	µg/m ³	<0.15	<0.15	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
2-Methylpentane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
3-Methylpentane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methyl-ter-butyl ether	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
N-Octane	0	µg/m ³	<0.19	<0.19	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Styrene	0	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethylene	0	µg/m ³	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Toluene	0	µg/m ³	0.28	2.3	0.4	1.5	0.23	2.3	1.4	0.54
1,1,1-Trichloroethane	0	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Trichloroethylene	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Xylenes	0	µg/m ³	0.15	1.6	0.27	0.95	0.18	1.4	0.98	0.3

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M081241 21/07/2008			Date= 4/06-11/06		11/06-18/06		18/06-25/06		25/06-2/07	
Laboratory ID =>			(blank cells = No test request)							
Sample Description =>			2E+09	2008015346	2E+09	2008015348	2E+09	2008015350	2.01E+09	2.01E+09
Parameter			CIE Q522R	River Avenue Q519R	CIE Y589D	River Avenue Y591D	CIE O863J	River Avenue O864J	CIE O865J	River Avenue O868J
Parameter	PQL	Units								
Benzene	0	µg/m ³	<0.13	2	<0.13	2.2	0.13	2.2	1.9	<0.13
Bromochloromethane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Butanol	0	µg/m ³	<0.14	<0.14	<0.15	<0.15	<0.15	<0.15	<0.14	<0.14
2-butoxyethanol	0	µg/m ³	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Butyl acetate	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
Cyclohexane	0	µg/m ³	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.19	<0.19
Cyclohexanone	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.15	<0.15
n-decane	0	µg/m ³	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.24	<0.24
1,2-Dichloropropane	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl acetate	0	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.13	<0.13
Ethylbenzene	0	µg/m ³	<0.16	0.28	<0.16	0.28	0.16	0.35	0.22	<0.15
Ethyl-tert-butyl ether	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
n-Heptane	0	µg/m ³	<0.18	0.59	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18
n-Hexane	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Isobutanol	0	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Isooctane	0	µg/m ³	<0.19	<0.19	<0.2	0.39	<0.2	<0.2	<0.19	<0.19
Isopropylbenzene	0	µg/m ³	<0.18	<0.18	<0.19	<0.19	<0.19	<0.19	<0.18	<0.18
1-Methoxy-2-propanol	0	µg/m ³	<0.19	<0.19	<0.2	<0.2	<0.2	<0.2	<0.19	<0.19
1-Methoxy-2-propyl acetate	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
Methyl methacrylate	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.15	<0.15
Methylethylketone	0	µg/m ³	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.13	<0.13
Methylisobutylketone	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
2-Methylpentane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
3-Methylpentane	0	µg/m ³	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methyl-ter-butyl ether	0	µg/m ³	<0.16	<0.16	<0.17	<0.17	<0.17	<0.17	<0.16	<0.16
N-Octane	0	µg/m ³	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Styrene	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.17	<0.17
Tetrachloroethylene	0	µg/m ³	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Toluene	0	µg/m ³	0.38	1.9	0.29	1.7	0.47	2	1.4	0.34
1,1,1-Trichloroethane	0	µg/m ³	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Trichloroethylene	0	µg/m ³	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.15	<0.15
Xylenes	0	µg/m ³	0.18	1.1	0.18	1	0.28	1.2	0.8	0.18