Kelvinator Pty Ltd

Surface Mass Flux & Sub-slab Soil Vapour Measurements for Identification of Trichloroethene March 2014 Keswick, South Australia 28 May 2014



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Executive Summary

In March 2014, Kelvinator Australia Pty Limited (Kelvinator) engaged Parsons Brinckerhoff Australia Pty Limited (Parsons Brinckerhoff) to conduct environmental field investigations in relation to potential contamination around the perimeter of the site of a former manufacturing facility at 62-70 Everard Avenue, Keswick, South Australia (the site).

Purpose

The purpose of the investigation was to identify the possible migration of trichloroethene and other associated chlorinated solvents in groundwater beyond the boundaries of the former manufacturing site, and assess whether any impacts associated with off-site chlorinated solvents may constitute health risks, from the intrusion of vapours into near-by buildings.

Background

Parsons Brinckerhoff understands that Kelvinator is the former owner of the site, Keswick and operated a manufacturing facility on the site. Land at the site was progressively purchased commencing about 1939 and Kelvinator disposed of the entire site in around 1985.

The Environment Protection Authority of South Australia (EPA) wrote to Arrium Limited (Arrium) on 13 February 2014, advising that volatile chemical substances were identified at the site in concentrations above the relevant investigation levels and those chemical substances include tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride (VC), chloroform and carbon tetrachloride. The EPA further stated that these chemicals were identified in soil, soil vapour on-site and/or in groundwater on-site and off-site and that the nature of the chemical substances identified at the site and at the site boundaries indicates a potential human health risk to adjacent receptors through exposure to vapour intrusion and contaminated groundwater.

Investigation objectives

The major objectives of Parsons Brinckerhoff's investigation were to measure the concentrations of TCE and a group of other volatile chlorinated compounds in vapours within the shallow soil profile and to measure the flux strength of those compounds from the ground surface at locations around but outside the perimeter of the site. The two reasons for carrying out the investigations were:

- 1. to compare measured concentrations against screening level criteria for vapour intrusion health risks, so as to provide a screening level assessment of potential vapour intrusion risks; and
- 2. to identify the direction or directions in which the contaminants are migrating from the site in groundwater.

Scope of works

The scope of works for the vapour investigations consisted of two components:

 the measurement of surface mass flux strengths of the contaminant compounds of interest at 10 locations outside and around the perimeter of the site, and the measurement of the vapour concentrations of those same compounds in the soil vapour in sub-slab boreholes at 37 locations outside the perimeter of the site.

Results

Identification of groundwater plume movement and other impacted areas

The pattern of concentrations of TCE in soil vapour within the sub-slab testing points indicated a groundwater plume of TCE migrating in a south south-easterly direction beneath Everard Avenue, with the site being the apparent source area. Surface flux measurements support this finding with one comparatively high flux reading for TCE found on the southern side of Everard Avenue, approximately over the axis of the apparent plume identified by sub-slab vapour measurements.

There was another area of elevated TCE soil vapour concentrations beneath the pavement of the new car park at the northern (rear) end of the site of the new self-storage building. TCE presence in this area can be postulated to be the result of filling and levelling of the land using TCE impacted soil from the development site. The existence of this area of impact is most clearly indicated by the sub-slab vapour concentration data, but there is also some indication of its existence from the surface flux measurements.

A clearly identifiable area of PCE impact, which is unlikely to be related to the site, was detected on Croydon Road north-east of the site. The area extends under the new pavement at the rear of the new self-storage building. This area, prominently identified by sub-slab soil vapour measurements was also detected in one of the flux chamber locations.

Evaluation of vapour intrusion risk

Concentrations of TCE in the sub-slab soil vapour exceeded the interim soil vapour investigation levels (HILs), presented in the *National Environment Protection (Assessment of Site Contamination) Measure 2013 (No 1)* (NEPM), in the two areas of major detection. These criteria for chlorinated VOCs are intended as screening level criteria, such that exceedences indicate a need for targeted, site specific investigations. While the HIL for TCE as listed in the NEPM is 80 μ g/m³, a maximum value 4,200 μ g/m³ was recorded and TCE concentrations at 9 of the 37 test locations exceeded the HIL. Surface flux measurements are a more direct and often more relevant measure of the vapour intrusion risk. Four flux chamber measurement locations fell within the two areas of substantial TCE soil vapour impact and in all cases vapour intrusion risks calculated from the flux measurements showed low and acceptable vapour intrusion risks.

Consideration of further evaluation of risks

The testing has shown a clear indication of the likely presence of a plume of TCE impacted groundwater migrating southwards from the site. The presence and potential impacts of this apparent plume could be better defined by investigating contaminants in groundwater.

Surface flux measurements on the natural surface of the road verge along Everard Avenue, coinciding with the area of high TCE concentrations measured in sub-slab soil vapour, indicate that the vapour intrusion risks are very low and acceptable for any building in the area. Greater certainty of this result (i.e., an acceptable vapour intrusion risk) could be gained by measurement of the flux through the flooring of the buildings to the south of Everard Avenue. Ambient indoor air concentrations could also be collected as a further line of evidence in the evaluation of vapour intrusion risk for building occupants.

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1. Introduction

1.1 Purpose of this report

In March 2014, Kelvinator Australia Pty Limited (Kelvinator) engaged Parsons Brinckerhoff Australia Pty Limited (Parsons Brinckerhoff) to conduct environmental field investigations in relation to potential contamination around the perimeter of the site of a former manufacturing facility known as 62-70 Everard Avenue, Keswick, South Australia.

The purpose of the investigation was to expedite the gathering of data to determine whether trichloroethene, and other chlorinated solvents, previously found in soil and groundwater beneath the site of the former manufacturing facility (the site), had migrated beyond the site at levels that might constitute health risks for occupants in nearby buildings. A further purpose of the investigation was to identify, to the extent possible, the direction of flow of the groundwater which would be the main mechanism by which the contaminants could migrate away from the site. Direction of groundwater flow would be indicated by the pattern of soil vapour concentrations of trichloroethene and surface flux rates at testing locations beyond the perimeter of the site.

1.2 Background information

Parsons Brinckerhoff understands that Kelvinator is the former owner of land at 62-70 Everard Avenue, Keswick and operated a manufacturing facility on the site. Land at the site was reported to have been progressively purchased commencing about 1939 and Kelvinator disposed of the entire site in around 1985. The Environment Protection Authority of South Australia (EPA) wrote to Arrium Limited (Arrium) on 13 February 2014, advising Arrium that EPA had received on 4 November 2013, notification of site contamination of underground water pursuant to section 83A of the Environment Protection Act, 1993. As stated in the EPA's letter the following chemical substances were present at concentrations above relevant investigation levels: tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride (VC), chloroform and carbon tetrachloride. The EPA noted that the chemicals were identified in soil, soil vapour on-site and/or in groundwater on-site and off-site. Further, the EPA's letter to Arrium stated: "The nature of the chemical substances identified at the site and at the site boundaries indicates a potential human health risk to adjacent receptors through exposure to vapour intrusion and contaminated groundwater."

1.3 Objectives

The major objectives of Parsons Brinckerhoff's investigation were to measure the concentrations of TCE and a group of other volatile chlorinated compounds in vapours within the shallow soil profile and to measure the flux strength of those compounds from the ground surface at locations around but outside the perimeter of the site. The two reasons for carrying out the investigations were:

1. to compare measured concentrations against screening level criteria for vapour intrusion health risks, so as to provide a screening level assessment of potential vapour intrusion risks; and

2. to identify the direction or directions in which the contaminants were migrating from the site in groundwater.

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1.4 Scope of works

The scope of works for the vapour investigations consisted of two components:

- the measurement of surface mass flux strengths of the contaminant compounds of interest at 10 locations outside and around the perimeter of the site, and
- the measurement of the vapour concentrations of those same compounds in the soil vapour in sub-slab boreholes at 37 locations outside the perimeter of the site.

Both measurement methods provided data by which the strength of contaminant vapours from the groundwater or contaminated soil horizons could be quantified, albeit, by measuring two different aspects of the vapour contamination (i.e. mass flux and concentration).

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2. Site information

The information presented below is based on observations during the field measurement activities on 18-19 March 2014.

2.1 Investigation area identification

The investigation area was the roads and road reserves around the perimeter to the east, south and west, and on-site along the northern boundary of the property know as 62-70 Everard Avenue, Keswick South Australia. Photographs of the site and surrounding streets are included in Appendix F.

2.2 Local land use

The site comprises, on the eastern half, a recently constructed building hosting a self storage business, while the western half of the site is a construction site of a commercial building.

Adjoining the northern boundary of the site is a commercial or light industrial facility beyond which lie low density residential dwellings. Beyond the roads forming the eastern, southern and western boundaries of the site lie commercial and light industrial properties.

2.3 Physical conditions

The topography of the site and surrounding land is almost flat but there is, visually, a very slight slope downwards to the south. Groundcover in the investigation area consisted of asphalt roads, concrete footpaths on the road reserves and on some stretches of road reserve, gravel/granulated granite or quartz coverage of the natural surface. Small areas of garden landscaping were present on road corners.

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3. Conceptual model of contaminant migration

The hydrogeological structure has not been adequately defined in earlier investigations on the site, thus making the formulation of a conceptual site model for the transport and behaviour of the contaminants on and off-site, somewhat speculative.

From the borehole logs prepared during drilling for the installation of two on-site groundwater monitoring wells (Tierra Environment, 18 December 2013) filling was found in the upper metre of the soil profile, underlain by a deep horizon of silty clay with sandy clay below 12 m. filling underlain by silty clay was also recorded by BlueSphere Environmental, 17 December 2013, when installing soil vapour bores to depths of 5 m.

Soil vapour measurements at depths of 1.5 m and 5 m showed high concentrations of TCE vapours clearly indicative of soils that had been directly impacted by TCE releases (that is, on-site releases of TCE). Gauging of groundwater monitoring wells on 10 December 2013 by Tierra Environment showed standing water levels in the two on-site wells, KMW2 and KMW3 to be 13.65 mAHD and 11.48 mAHD, respectively. These two wells are only 13 m apart, so the difference in standing water levels is unexplained. The standing water level for the off-site well on the edge of Ashford Road was much higher at 17.61 mAHD. The large differences in standing water level were found again when Parsons Brinckerhoff re-gauged the three wells on 21 March 2014.

Standing water levels are not necessarily indicative of the depth of the aquifer as the water may have a head pressure. Water strike was indicated at 8.0 m in KMW1, not indicated for KMW2 and saturation was indicated for KMW3 at about 16.5 m below ground level. The depth or depths of the contaminant transport in groundwater is therefore not known.

High concentrations of dissolved phase TCE in groundwater measured in wells KMW2 and KMW3, on-site, indicate the TCE detected in the soil profile has percolated downwards through the soil profile and into the water – the depth of which is unclear. The direction of flow of groundwater cannot be determined from the groundwater gauging data.

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4. Contaminant of interest

In its letter to Arrium dated 13 February 2014, the EPA listed the following volatile chemical substances present at the site at concentrations above relevant investigation levels: tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride, chloroform and carbon tetrachloride.

The chemicals listed by the EPA have been included in a suite of volatile organic compounds (VOCs) used in the analysis of the surface flux and sub-slab soil vapour samples. The chemical analysis suite can be found in the laboratory reports attached as Appendices D and E. The analytical suite also contains many compounds that may not be associated with the site. The additional analytes have been retained in the analytical suite because it is a standard analytical suite and because they may assist in the interpretation of the data.

5. Sampling plan and methodology

5.1 Rationale for the selection of sampling methods

As stated earlier, the primary purpose of the investigation was to identify whether or not the contaminants of concern are migrating away from the site and if so, in what direction. The second purpose of the investigation was to measure the strength of a possible vapour intrusion pathway whereby contaminant vapours may be migrating upwards through the soil profile from the groundwater and permeating into buildings lying over a plume of impacted groundwater.

For a complete vapour intrusion pathway to exist, the contaminant vapours must be present at the ground surface (assuming sub-ground level basements are not present). Sub-slab vapour measurements will confirm whether contaminant vapours are present beneath pavements (at or above the method detection limit), and surface mass flux measurements will detect those compounds at the surface – if present. Thus both flux and sub-slab measurement methods can detect the presence of the contaminants of interest and both address the first purpose of the investigation. The two methods are conceptually different in that they measure different aspects of the gaseous contaminants. The contaminant mass on the sub-slab sampling tube is converted to a concentration whereas the contaminant mass on the surface flux sampling tube is expressed as a mass flux strength.

Both sub-slab soil vapour concentrations and surface mass flux measurements can be used to estimate potential indoor air concentrations resulting from vapour intrusion. Sub-slab concentrations are used either in numerical models using pressure driven advective flows through floor gaps into the building air space and dilution assumptions, or by applying an empirically derived statistical factor (the alpha factor) converting sub-slab concentrations to indoor air concentrations. The NEPM, 2013, applies the second method (i.e., the alpha factor) to derive screening level interim health investigation levels (HILs) for chlorinated solvents.

Surface mass flux chamber measurements, which are a measure of diffusive contaminant flux through flooring, are used directly to calculate the indoor air concentration from the vapour intrusion pathway – assuming only a ceiling height and an air exchange rate.

Essentially, both methods were employed in the investigation in order to provide parallel lines of evidence for both the presence/absence of a plume transporting the contaminants off-site, and for evaluation of a potential vapour intrusion risk in off-site buildings.

The passive mass flux chamber method is particularly sensitive. For the setup used in this investigation, a detection of 5 ng/tube was achieved which translates to a mass flux rate of 0.0054 μ g/m²/h, a negligible flux rate which would produce a negligible indoor air concentration in a commercial building of 0.0015 μ g/m³.

5.2 Sub-pavement soil vapour sampling plan

VOCs, including the contaminants of interest for this investigation were measured by drilling, using a hand held electric drill with a 20 mm diameter drill bit, at 37 locations around the site along public footpaths of the road reserves on three sides of the site and along the pavement of the car park of the constructed site building. Sub-slab sampling locations are shown in Figure 1.

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5.3 Surface mass flux sampling plan

The surface mass flux of VOCs was measured by passive flux chambers at 10 locations along the transects of sub-slab soil vapour sampling points. With one exception the flux chambers were placed on natural unpaved ground on the road reserves, and not on the concrete footpaths. The exception was PF9 which was located on the concrete covered car park at the rear of the development site (i.e., along the northern site boundary). The reason the flux chambers were placed on bare ground was because concrete cover commonly reduces the mass flux rates of VOCs and as a primary purpose of the flux measurements was to identify the direction in which contaminants may be migrating away from the site, thus the most sensitive method of measurement was used.

5.4 Passive surface flux chamber method

The passive flux chamber involves the placement of a high uptake rate sorption tube placed within the void of a stainless steel chamber located directly on the ground surface or pavement. After the predetermined deployment period of around 8 hours for most chambers used in the current investigations, the passive sorption tube was collected for laboratory analysis involving thermal desorption followed by GC-MS analysis.

For the current investigation, Radiello solvent desorption tubes (ID code 145 cartridge) were used, allowing a detection limit of 0.005 µg/tube (5 nanograms) and suitable for deployment periods of several hours to one day. The detection limit, expressed as a calculated flux, is proportional to the deployment (sampling) time. Radiello sampling tubes are described in: Radiello Fondazione Salvatore Maugeri-IRCCS, http://www.radiello.it/index.html

The principal of operation of the passive flux chamber is that the VOC mass absorbed onto the passive tube placed within the chamber void is a close approximation of the total VOC mass flux into the chamber from the surface on which the chamber is placed. For the mass collected on the sampling sorption tube to be approximately equal to the mass flux into the chamber, a concentration depression within the chamber must be maintained. This is achieved through the high sorption rates (sampling rates) of the Radiello sampler which has a capacity to sorb contaminants at a greater rate than the flux into the chamber. Essentially, the Radiello sampler 'captures' the mass flux into the chamber from the ground surface. The concentration depression is maintained unless the sorption tube becomes saturated. Saturation of the sorption tube would not occur under normal sampling conditions. Maintenance of the concentration depression has been previously demonstrated and reported in Heggie & Stavropoulos 2010.

Flux into the passive chamber can thus be expressed as:

Flux $(\mu g/m^2/h)$ = mass on tube $(\mu g) \times 1/chamber$ footprint $(m^2) \times 1/sampling$ duration (h)

Deployment method – passive flux chambers

The stainless steel passive flux chambers, 0.35 m in diameter and 8 L capacity, were seated on either a natural surface of the road reserve (i.e., beside the paved footpaths) or on concrete. A Radiello passive absorptive sampling tube was suspended within the void of the chamber. To ensure no advective exchange of air occurred between the ambient air (the outdoor atmosphere) and the air within the chamber sand and local surface soil was placed around the rim of the chambers placed on nature surfaces. For the chamber placed on a concrete surface, Blu-Tack[™] was placed around the rim of the chamber to provide the seal.

After the predetermined deployment (i.e. sampling) time, the sampling tubes were removed from the chambers and placed in sealed glass vials for transport to the analytical laboratory.

Analytical methodology – passive flux chambers

The sorbent tubes were returned to the laboratory where they were solvent desorbed and analysed by GC-MS.

The laboratory determines the masses of a range of VOCs on the tubes.

5.5 Sub-slab passive soil vapour implant method

The passive soil vapour sampling tube type used was the Waterloo Membrane Sampler – Low Uptake (WMS_LU[™]), developed by the University of Waterloo. While the WMS_LU[™] sampler is a passive sampler, containing an absorptive carbon medium within a small glass vial with a permeable membrane at the end of the glass vial, the sampler has been specifically designed and developed to allow quantification of volatile organic compounds in the soil pore space. A description of the method of passive soil vapour sampling using the WMS samplers is given in McAlary et al., 2009.

The method allows for the calculation of actual concentrations in the soil gas on account of two critical features of the method. Firstly, the samplers are designed to maintain a constant but low uptake rate which, consequently, establishes the second critical factor – prevention of the depletion of the target analyte concentrations (the VOCs in the soil void), i.e., a 'starvation effect' is avoided and a constant uptake rate onto the sampler is maintained. Uptake rates for the sampler have been empirically derived and the method has been validated against the TO-15 active sampling method.

Calculation of mass was not critical to the objectives of the investigation, however the data are expressed also as calculated concentrations of soil vapour, in the unit of µg/m³. The calculation was performed using the manufacturer's published uptake rates which are specific for each compound and for the type of sampler used (i.e. the WMS_LU[™]). Expression of the data in concentration terms allows a better context in which to interpret the results and allows comparison of the measured concentrations against health investigation levels (HILs) for soil vapour published in NEPM, 2013.

5.5.1 Method of sample deployment, duration and tube recovery

Pavements were drilled using a 20 mm diameter drill bit on a hand held electric drill to depths of 300 mm below the top of the pavement. To deploy the WMS-LU[™] tubes in the holes, the tubes were first wrapped in metal flyscreen to protect the sampling tube from direct contact with soil. The tube was then lowered into the drilled hole attached by a wire. The holes were sealed using a sand-cement grout to provide an air and water seal. The grout plug was finished flush with the pavement surface.

Sampling tubes were recovered from the sampling holes after three weeks of deployment by pulling up the sampler by the attached wire after breaking the grout seal. Sampling tubes were placed in their glass vials and sent under chain of custody to the analytical laboratory, SGS - Leeder Consulting.

6. Data quality objectives

Schedule B2 of the NEPM 2013, recommends that a systematic planning process is used for defining the objectives of the assessment and the sampling plan that can meet those objectives. The NEPM 2013 states:

"In its simplest form, the planning process should consider:

- the overall objective of the site assessment
- the decision(s) to be made on the basis of the site assessment findings
- the constraints on the assessment (financial, time and logistical) and
- the degree of flexibility to conduct follow-up investigations."

The intent of the above planning process is to identify the methodologies needed to undertake measurements that are achievable and collect data that are adequate to study objectives. A second aspect of data quality control is the process of assuring the quality of the data collected which in turn involves the controls on how samples are collected. A third aspect is the means by which the reliability of the analytical results is quantified.

6.1 Planning process

With regard to controls on project quality planning and design, the following comments are relevant.

The overall objectives of the work planned and undertaken in March 2014, that is, the investigation works by Parsons Brinckerhoff, were to identify the possible presence of chlorinated solvent soil vapours beyond the site's boundaries, and if detected, identify the likely direction in which the contaminants are leaving the site. And, if detected, identify whether the concentrations as measured in the soil vapours may potentially present a health risk to occupants of buildings adjacent to the site.

With regard to the decisions to be made on the basis of the findings, the results may assist in any considerations of possible further work.

Restrictions to available sampling locations was a constraint on the sampling design. For reasons not discussed further here, sampling locations were restricted to the road verge (footpath areas) on three sides of the site and a concrete covered car park at the northern end of the site which was not part of the active building site.

6.2 Data quality control – field and laboratory

6.2.1 Surface flux measurements

Field data quality control for passive flux chambers is a relatively simple process that involves:

- proper handling of the sampling tubes to avoid contaminating the tubes during deployment into the chambers and collection from the chambers, and avoiding any exposure of the sampling tubes to contaminants other than during the deployment within the chambers. This process is easily achieved by the use of clean nitrile gloves when handling the tubes and avoiding any contact of the tubes by hand.
- careful handling of the cleaned flux chambers to ensure the internal chamber surface remains untouched during transport and deployment;

- ensuring no gap exists between the chamber rim and the ground surface through which an advective air exchange could occur;
- taking duplicate samples within one or more of the chambers to provide a measurement of the precision of the measurements. For the current investigation duplicate tubes were placed in two of the flux chambers. There are no Australian reference guidelines for the acceptable degree of difference (as measured as relative percent difference (RPD)) for flux measurements, nor even for soil vapour concentration measurements. Acceptability of an RPD value is dependent on measured mass, relative to the detection limit. Generally, where the measured mass is more than one order of magnitude greater than the detection limit, RPDs within 100% are acceptable.
- analysing one trip blank to quantify any background contaminants on the sampling tubes.

Laboratory quality control can be evaluated by the results from method blank testing and from recoveries from spiked samples. For the current investigation the analytical laboratory undertook one method blank analysis and one method spike analysis – conducted in duplicate.

6.2.2 Sub-slab vapour measurements

Field data quality control for sub-slab vapour measurements is, like the process for flux, a relatively simple process that involves:

- proper handling of the sampling tubes to avoid contaminating the tubes during deployment into the drilled holes and collection from the holes at conclusion of sampling, and avoiding any exposure of the sampling tubes to contaminants other than during their deployment. This process is easily achieved by the use of clean nitrile gloves when handling the tubes and avoiding any contact of the tubes by hand.
- Deploying the sampling tubes into the drilled holes in a manner that protects the tubes from direct contact with soil and water; and the sealing of the holes to prevent the entry of air or water for the duration of the sampling period.
- taking duplicate samples within one or more of the soil vapour testing holes to provide a measurement of the precision of the measurements. For the current investigation duplicate tubes were placed in four of the sub-slab drilled holes. There are no Australian reference guidelines for the acceptable degree of difference (as measured as relative percent difference (RPD)) for soil vapour concentration measurements. Acceptability of an RPD value is dependent on measured mass, relative to the detection limit. Generally, where the measured mass is more than one order of magnitude greater than the detection limit, RPDs within 100% are acceptable.
- It is critical to ensure that any supporting materials deployed with the sampling tubes such as the
 protecting wire screen in which the sampling tubes are wrapped before deployment into the holes, is
 laboratory tested to ensure it is free from VOCs.
- Upon collection of the sampling tubes from the holes, placement of the tubes immediately into their vials and ensuring complete sealing of the vials.

Laboratory quality control can be evaluated by the results from method blank testing and from recoveries from spiked samples. For the current investigation the analytical laboratory undertook three method blank analyses and one method spike analysis – all three conducted in duplicate.

7. Reference guidance

7.1 Flux

There are no published reference values for flux rates. It would not be appropriate to produce and present such reference values as the effect of the flux is dependent on the resulting concentration which itself is dependent on the mixing rate within the receiving air (such as a room within a building).

For the present investigation, flux has been used for two purposes, firstly to identify the presence or absence of detectable VOC vapours (TCE was of principle interest) in the soil profile, and secondly to provide an indication of whether, if present, TCE represented a potential health risk through the vapour intrusion process for in-site buildings. The passive flux chamber method as used provides very low detection limits and can detect a single compound down to 5 ng on the tube.

With regard to the use of flux as a method to evaluate and quantify potential vapour intrusion health risks, both Australian and overseas guidance refers to surface flux as a further line of evidence and allows a measurement near to the end of the vapour intrusion pathway.

7.2 Soil vapour

Relevant screening level (tier 1) guidelines, for human health effects, relating to soil vapour concentrations are Interim soil vapour health investigation levels for volatile organic chlorinated compounds (HILs) presented in *Schedule B1 Investigation Levels for Soil and Groundwater* in the NEPM. HILs for the contaminants of interest for this investigation are listed in Table 8.1.

Table 7.1Interim screening level criteria for soil vapour concentrations of chlorinated VOCs. Criteria
are applicable to shallow soil (to 1 m below ground/floor level)

Chemical	Interim soil vapour HIL (µg/m³)		
	Commercial/industrial land use	Low density residential land use	
tetrachloroethene	8,000	2,000	
trichloroethene	80	20	
cis-1,2-dichloroethene	300	80	
vinyl chloride	100	30	

Of the HILs the NEPM states:

"Interim HILs for VOCs are conservative soil vapour concentrations that can be adopted for the purpose of screening sites where further investigation is required on a site-specific basis. They are based on the potential for vapour intrusion using an indoor air-to-soil vapour attenuation factor of 0.1..."

Thus the guideline can be interpreted to mean that a sub-slab concentration of 80 μ g/m³ of TCE may result (taking a conservative statistical approach) in an indoor air concentration of 8 μ g/m³, which, if exceeded, would represent a possible health risk to building occupiers.

8. Sampling results and discussion

8.1 Weather conditions

Weather conditions may influence shallow soil vapour concentrations. For that reason weather records for March and April 2014 have been included in Appendix C. The magnitude of the effect of changes in soil vapour concentration in response to changes in soil moisture content has not been clearly established in the literature. However, increasing moisture content in the soil profile is expected to have a minor impact on soil vapour concentrations but for diffusive mass flux rates the influence of increasing moisture within the soil profile may be significant.

In the 24 hours prior to the emplacement of the flux chambers rainfall at Adelaide airport was 1.2 mm, and on the day prior, 11.4 mm. The natural surface of the road reserve – gravel and crushed rock, was slightly moist at the time of deployment of the flux chambers.

Temperature of the soil profile also has an effect on soil pore vapour concentrations, although the effect is relatively small. The expected seasonal range in profile temperature, of about 5 °C would result in a change of about 25% in vapour concentration. The temperature of the soil profile will also influence the mass flux through the profile such that rates of flux will increase with temperature.

The weather conditions prevailing during the period leading up to the vapour testing and during the time of the testing are considered to be normal and typical. Accordingly, it vapour results can be considered to be representative of normal conditions.

8.2 Soil profile and surface conditions

Because the vapour investigation for the current study involved surface flux and sub-slab soil vapour measurements, the soil profile was not examined. Information on the soil profile just beyond the boundary of the site along Ashford Street is available from a borehole log in a report prepared by Tierra Environment dated 18 December 2013. The borehole log shows a profile of silty clay from the surface to 11 m below ground level at which depth a clayey silty sand horizon was encountered. The log records saturation at a depth of 8 m.

8.3 Flux measurements

8.3.1 Detected contaminants on flux sampling tubes

Results of the laboratory calculations of the mass of contaminants on the tubes within the flux chambers are tabulated in Table A1. These numbers represent the mass of contaminant vapours collected onto the tubes within the flux chambers. It must be recognised that these are total mass values for each contaminant collected over the sampling duration. Sampling durations for PF1 to PF8, which were located on the public streets, were 7.4 to 9.9 hours. For PF9 and PF10, sampling durations were longer at 23.3 and 23.1 hours, respectively, as these samplers were left in place overnight because they were securely located on the site property. The recorded data become comparable when expressed as mass flux per m² per hour. Flux results, but only for the two contaminants of interest with detectable fluxes, TCE and PCE, are presented in Table A2.

Trichloroethene (TCE)

Of the 10 surface flux measurement locations, external to or on the perimeter of the site, six showed detections of TCE above the laboratory reporting limit of 5 ng/tube. The highest recorded value was 193 ng/tube at PF5 on Everard Street, south of the site. That recording can be considered a low value. All the other recorded values can be considered trace readings.

Tetrachloroethene (PCE)

PCE was detected a five locations, all but one being at trace levels. The exception was a low detection at PF10 with 260 ng/tube. PF10 lies on the concrete car park pavement on the northern side of the recently developed building on the site.

Other detected compounds

Daughter compounds, derived from the degradation of TCE are, firstly, cis-DCE and vinyl chloride. Neither was detected in any flux chamber.

One other chlorinated VOC, trichloromethane, commonly known as chloroform, was detected as a flux in two of the 10 flux chambers, but only just over the detection limit. Chloroform occurs naturally in the soil profile (Hoekstra et al, 1998), and it is not uncommon to find it as a soil vapour in Australian soils. It is thus reasonable to assume it is not related to the site's former use. In any case, the amount of chloroform detected can be considered trace. Similarly, carbon tetrachloride was detected just above the laboratory detection limit at one location (PF4). Carbon tetrachloride occurs as a background contaminant in the atmosphere, but the origin of this trace level occurrence is uncertain.

Several VOCs associated with petrol, in particular, benzene and 2-methylbutane, were present in most of the 10 flux chambers. Some, if not most of these detected VOCs may have had their origin in the atmosphere – their presence in the flux chambers attributable to their entrainment into the soil profile from the atmosphere – thence into the flux chambers.

8.3.2 Measured surface flux rates and risk evaluation

As mentioned afore in section 6 Sampling Methodology, the mass collected on the passive sampling tube within the flux chamber can be expressed as a mass per unit area per unit time as:

Flux ($\mu g/m^2/h$) = mass on tube (μg) x 1/chamber footprint (m²) x 1/ sampling duration (h)

Of the contaminants of interest, only TCE and PCE were recorded above detection limits and those values are listed in Table A2.

For vapour intrusion investigations the value of mass flux measurements is in the calculation of resulting indoor air concentrations. Indoor air concentrations were calculated using the following equation.

$$C_{air} = \frac{Flux \times A_{floor}}{V_{building} \times air \ exchange \ rate}$$

where,	C _{air}	=	concentration in indoor air (µg/m ³)
	Flux	=	measured flux (µg/m²/h)
	A _{floor}	=	floor area of the office or warehouse (m ²)
	V _{building}	=	floor area x ceiling height (m ³)
	air exchange rate	=	volume exchange per hour (h)

Flux chambers were placed on unpaved ground with the exception of PF10 which was placed on concrete pavement and flux rates at all but one, PF5, were trace levels. To illustrate the very minor effect on indoor air concentration caused by the surface fluxes the indoor air concentration resulting from the measured flux of TCE at PF5 (i.e. the highest measured at 208 $ng/m^2/h$)) was calculated. This is a conservative calculation because PF5 was measured on unsurfaced ground on the road verge of Everard Avenue and it can reasonably be expected that a concrete floor slab would add some more resistance to the molecular diffusion rates and thus reduce flux. The area of the floor is not a critical variable, if it is assumed that the flux is equal over the entire floor area, because the factor cancels out in the equation. The volume term in the equation is set by assuming a ceiling (i.e., mixing) height and an air exchange rate. For commercial buildings NEPM, 2013 recommends a ceiling height of 3 m and an air exchange rate of 1.24 volumes per hour. Using those assumptions the resulting indoor air concentration of TCE would be 0.056 µg/m³. To place this very low concentration into a human health risk context, using World Health Organisation (WHO) 2000 toxicity and risk guidance values (a unit risk of 4.3 x10⁻⁷) at a risk level of 10⁻⁵, the acceptable ambient (indoor) air concentration, without exposure adjustment, is 23 µg/m³. The US EPA's IRIS data base lists a lower value for unit risk (a more stringent criterion) at 4.1×10^{-6} . Using this 'toxicity' derived value and an acceptable risk level of 10⁻⁵, an acceptable indoor air concentration of 2.4 µg/m³ is derived. The flux derived indoor air concentration of 0.056 µg/m³ is also much lower than the IRIS derived indoor air acceptable concentration.

The carcinogenic risk resulting from the flux calculated indoor air concentration of 0.056 μ g/m³ is determined using the equation:

Risk = the exposure adjusted concentration x unit risk

The adjustment used in the risk calculations is in accordance with the referenced factors listed in Table 9.2 and the equation for the conversion of indoor air concentrations (C_{air}) to exposure concentrations (EC) is:

 $EC = C_{air} \times ET \times EF \times ED / AT$

Toxicity values are listed in Table 9.1 and exposure adjustment factors for indoor commercial/industrial workers are shown in Table 9.2.

Compound	Reference	Unit risk (carcinogens) (risk per μg/m³)	Reference dose (non-carcinogens) units: μg/m³)
TCE	US EPA IRIS database	4.1 x 10 ⁻⁶	2
	WHO	4.3 x 10 ⁻⁷	not given
PCE	US EPA IRIS database	2.6 x 10 ⁻⁷	40
	WHO 2010	not classified as a carcinogen	250

Table 8.1	Toxicity criteria for TCE and PCE
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 Table 8.2
 Exposure parameters – commercial/industrial indoor workers

Exposure parameter	Unit	Value	Reference	Note
Exposure time (ET)	h/day	8	CRC CARE (2011)	
Exposure frequency (EF)	days/year	240	CRC CARE (2011)	Working days per year
Exposure duration (ED)	years	30	CRC CARE (2011)	Number of years in one occupation
Averaging time for carcinogenic effects (ATc)	years	82	CRC CARE (2011)	Life expectancy (enHealth (2012))

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Exposure parameter	Unit	Value	Reference	Note
Averaging time for non-carcinogenic effects (ATnc)	years	30	CRC CARE (2011)	set equal to the exposure duration

In accordance with the exposure factors listed in Table 9.2, the factors to adjust the ambient air concentration to the exposure adjusted concentration are 0.08 for carcinogens and 0.22 for non-carcinogens. The potential indoor air concentration determined from the highest measured flux rate, i.e., 0.056 μ g/m³, adjusted for exposure becomes 0.004 μ g/m³. And the carcinogenic risk from this concentration is 1.9 x 10⁻⁹, which is more than three orders of magnitude below the acceptable risk level of 10⁻⁵.

The indoor air concentration arising from surface mass flux, for PCE has not been calculated because the maximum flux rate measured, 120 ng/m²/h at PF10, was much less than the highest TCE flux, and PCE has a much lower toxicity value.

Based on surface mass flux measurements, there is no indication of an unacceptable health risk from the vapour intrusion pathway into off-site buildings, and in fact, the contribution to indoor air for those buildings, if the measured values from the perimeter streets are indicative, is very low.

8.3.3 Flux as an indicator of direction of groundwater migration

If the site is the source of the TCE and PCE vapours detected by the flux chambers, then the pathway by which those contaminants are reaching the off-site flux chambers is either through vertical diffusion of vapours from groundwater impacted by TCE and PCE, originating on the site, or from the lateral diffusion of soil on the site impacted by those contaminants. Depth to the saturated zone is not known with any certainty and standing water levels (potentiometric levels) are variable across the three monitoring wells, ranging from 9 m to 16 m below local ground level. Lateral distances from the flux chamber locations to the soil sources on site are substantially greater than the depth to groundwater. Thus, it is likely that the flux recorded at PF5 on the southern side of Everard Avenue, south of the site (208 μ g/m²/h), is measuring diffusive flux from TCE in groundwater more so than from lateral diffusion from soil sources on the site. It is however plausible that the trace flux measured at PF2, PF3, PF4, PF7 and PF9 is largely a result of lateral diffusion of soil vapours from the site. In conclusion, based solely on the flux measurements, it appears that a groundwater with TCE impact has migrated southwards from the site under Everard Avenue. It should be appreciated that the strength of the flux, even at the highest measured location (PF5) is weak and does not necessarily imply significant concentrations in groundwater. The strength of the flux is however, dependent on not only the concentration of TCE in the groundwater, but also on the depth of the groundwater and the vapour permeability of the soil profile above the groundwater.

8.4 Sub-slab soil vapour measurements

Soil vapour concentrations were measured at 37 locations beneath council footpaths along the three roads forming the eastern, southern and western boundaries of the site and at two locations beneath concrete pavement along the northern boundary of the site. All sub-slab vapour samples were analysed for a suite of 48 volatile organic compounds comprising chlorinated compounds and petroleum hydrocarbons. Results for all sampling locations are tabulated in Table B1 of Appendix B.

Figures 1 and 2 graphically present the sub-slab soil vapour concentrations of TCE and PCE respectively. The dominant contaminant in the sub-slab vapours was TCE and PCE and cis-1,2-DCE were also present in some sampling points at low to moderate concentrations.

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8.4.1 TCE as an indicator of groundwater plume migration direction

The occurrence of significant concentrations of TCE was confined to two clearly defined areas. One area was the line of sampling points to the south of the site along Everard Avenue. While the majority of the sampling points to the east (Croydon Road) and to the west (Ashford Road) showed no detection of TCE, six of the Everard Avenue test points showed moderate to high TCE vapour concentrations (a maximum of $2,800 \ \mu g/m^3$ at SS19). The pattern of rise and fall of concentrations along this transect from SS17 to SS22 suggests there is a plume of TCE in groundwater with its axis under SS19. Assuming the source of the TCE plume is the centre of the site, the groundwater flow direction is towards the south-southeast.

A second area of high TCE vapour concentrations is at SS36 and SS37 located on the northern boundary of the site. This occurrence is not consistent with groundwater migration moving from a source on the site and another explanation for its occurrence in that area is more plausible. SS36 and SS37 were drilled through recently laid concrete forming a pavement for a car park outside the newly constructed storage units. It can be postulated that during the development of the new self-storage building and car park, TCE impacted soil was used to fill and level the area beneath the new pavement of the car park.

8.4.2 TCE soil vapour concentration measurements as an indicator of potential vapour intrusion risks

For a tier 1, screening level assessment of potential health risks from the intrusion of soil vapour into buildings, the measured sub-slab concentrations of TCE and other chlorinated compounds, can be compared to the NEPM interim soil vapour health investigation levels (HILs) presented and discussed in section 8.2 of this report.

As can be seen from the HILs for TCE and PCE, the toxicity of TCE is considerably greater than that of PCE. This follows from the use of WHO toxicity criteria for the derivation of the HILs as presented in the NEPM. The US EPA's IRIS data base also shows TCE to be substantially more toxic than PCE, in the context of vapour inhalation risk. Since TCE concentrations were found to be much greater than those for PCE, only TCE risks need to be considered in this evaluation of potential vapour intrusion risk.

It appears likely from the pattern of concentrations of TCE in the sub-slab soil vapour measurements that TCE has migrated in groundwater under Everard Avenue and a highest concentration of 2,800 μ g/m³ at SS19. Concentrations may be similar under part of the commercial building on the southern side of Everard Avenue. Compared to the HIL for TCE soil vapour concentrations, there is an apparent potentially unacceptable health risk for occupants of that building (the HIL for TCE is 80 µg/m³). However, this potential adverse risk outcome is not supported by the measured flux at location PF5 which is close to SS19. The HILs have been derived from the statistical treatment of sites in the USA contaminated with TCE where the ratio of soil vapour concentrations to indoor air concentrations of TCE were derived. The attenuation rate (soil concentration to indoor air concentration) of 0.1 represents the 95 percentile of the ratio and is thus very conservative. The normal approach to be taken when a measured soil vapour concentration exceeds an HIL is to undertake further assessment which targets the actual conditions applying to the investigated location usually the building itself. In the current study the measurement of flux on the bare ground of the road verges represents measurements that are more relevant to vapour intrusion risk as they measure the actual mass transfer rates of the TCE vapours out of the ground – albeit on bare ground which also produces a somewhat conservative measure. Those flux measurements indicated that the vapour intrusion (from the ground to the atmosphere) were very low and not indicative of unacceptable vapour intrusion risks (see section 9.3.2 above).

The surface mass flux measurements undertaken in this current investigation measured diffusive flux rates. It is possible that commercial buildings may have some floor openings whereby soil vapours can enter the building as advective flows – adding to the intrusion of vapours by diffusive flux through the floor. Investigations of vapour intrusion at existing buildings typically involves consideration and possibly measurement of all the likely vapour intrusion mechanisms and also of indoor air concentrations.

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8.4.3 PCE and other VOCs in soil vapour

Other than TCE there was only one compound that was prominent in the soil vapour measurements, and that was PCE. The pattern of occurrence of PCE in the sub-slab testing points surrounding the site is shown in Figure 2. It can be seen that there is a pattern of elevated concentrations of PCE in SS31, SS32 and SS33 to the north-east of the site on Croydon Road and at the northern boundary of the site. These concentrations are greatly less than the HIL for PCE. The occurrence of PCE vapours in this area suggests a source other than from the site, although it is possible that the PCE measured at SS36 and SS37 arises from contaminated soil originating at the site. Flux location PF10 was located in this area of elevated PCE concentrations and it too recorded an elevated PCE flux – albeit, not at a level indicative of unacceptable risk.

Another area of slightly elevated PCE soil vapour concentrations was to the south of Everard Avenue. This area coincides with the high concentrations of TCE identified with a suspected groundwater plume migrating under Everard Avenue.

Petroleum hydrocarbons indicative of petrol sources were detected in many of the soil vapour testing points at low concentrations. Compounds detected were, pentane, hexane, 2-methylpentane, benzene and other aromatic hydrocarbons. These occurrences are not considered to be of relevance to the investigation of the site but are indicative of contaminant impacts of industrialised areas. Their occurrence at the concentrations detected is not indicative of unacceptable vapour intrusion risks.

9. Assessment of data quality – surface flux

9.1 QA – flux measurements

Quantitative indicators of data quality comprised calculated RPDs for two field duplicates, one trip blank sample analysis, a laboratory method blank analysis and laboratory method spike samples analysed in duplicate. All the above quality indicators gave satisfactory results.

Flux was measured in duplicate in two chambers, PF5 and PF6. Of the contaminants of interest, only TCE was detected and only at PF5. The RPD was 28% which is considered good replication. Of the other compounds in the duplicate pair at PF5 all showed close agreement despite most readings being at very low or trace levels. Overall the results for PF6 and its duplicate showed similar RPDs, except for two analytes, dodecane and TRH >C₁₀-C₁₆ where RPDs were 141% and 182%, respectively. The reason for the differences in these two analytes is unknown and it is contrary to the close pattern observed for all other analytes. All RPD results are presented in Table A3 of Appendix A.

The trip blank analysis showed that no analyte was detected above the detection limit (laboratory's practical quantitation limit) – refer to Table A4 of Appendix A.

The laboratory performed one method blank analyses to test that the extraction and analytical procedures did not introduce any false positives into the results. There were no detections found.

To test the recovery of the extraction process, the laboratory performed one spike recovery analysis in duplicate. Percentage recoveries all fell within an acceptable range, from a low of 85% to a high of 102 %.

Results for the laboratory analyses of method blanks and recoveries are given in the laboratory reports included in Appendix D.

9.2 QA – sub-slab soil vapour measurements

Four duplicate sample pairs were analysed. One pair however showed no detection of any compounds. The highest RPD measured was an acceptable value of 59 % (ethylbenzene at SS37). For the contaminants of interest, the greatest RPD was 32 % for PCE at SS37. As stated in the above section on data quality control planning, there are no Australian guidelines for acceptable values of RPDs for soil vapour measurements. For this study an RPD of 100 % is considered acceptable where the values are greater than 10 times the detection limit. As the highest RPD for all compounds analysed was 59 %, it is concluded that the measurement and analytical methods produced reliable replicable results. Results of the RPD calculations are shown in Table B2 of Appendix B.

Two trip blanks were analysed and no compound was detected on either tube. Results are shown in Table B3 of Appendix B.

The laboratory performed three method blank analyses to test that the extraction and analytical procedures did not introduce any false positives into the results. There were no detections in the three analyses.

To test the recovery of the extraction process, the laboratory performed three spike recovery analyses – all in duplicate. Percentage recoveries all fell within an acceptable range, from a low of 91% to a high of 125 %.

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Results for the laboratory analyses of method blanks and recoveries are given in the laboratory reports included in Appendix E.

10. Conclusion

Testing for the presence of TCE and PCE in soil vapour outside the perimeter of the site was undertaken using two methods, one being diffusive flux from the ground surface and the other being the measurement of soil vapour concentrations beneath the pavement of footpaths and a car park area. Sub-slab soil vapour concentrations was the main method on account of the number of testing locations – 37 in all. Flux was measured at 10 locations.

Identification of groundwater plume movement and other impacted areas

The pattern of concentrations of TCE in soil vapour within the sub-slab testing points gives an indication of a groundwater plume of TCE migrating in a south-southeasterly direction beneath Everard Avenue, with the site being the apparent source area. Surface flux measurements support this finding with one comparatively high flux reading for TCE found on the southern side of Everard Avenue, approximately over the axis of the apparent plume identified by sub-slab vapour measurements.

There was another area of elevated TCE soil vapour concentrations identified beneath the pavement of the new car park at the northern (rear) end of the new self-storage building. TCE presence in this area can be postulated to be the result of filling and levelling of the land using TCE impacted soil from the development site. The existence of this area of impact is most clearly indicated by the sub-slab vapour concentration data, but there is also some indication of its existence from the surface flux measurements.

A clearly identifiable area of PCE impact, which is unlikely to be related to the site, was detected on Croydon Road north-east of the site. The area extends under the new pavement at the rear of the new self-storage building. This area, prominently identified by sub-slab soil vapour measurements was also detected in one of the flux chamber locations.

Evaluation of vapour intrusion risk

Concentrations of TCE in the sub-slab soil vapour exceeded the interim soil vapour investigation levels (HILs), presented in the NEPM, in the two areas of major detection. These criteria for chlorinated VOCs are intended as screening level criteria, such that exceedences indicate a need for targeted, site specific investigations. While the HIL for TCE is listed in the NEPM as 80 μ g/m³, a maximum value of 4,200 μ g/m³ was recorded and TCE concentrations at 9 of the 37 test locations exceeded the HIL. Surface flux measurements are a more direct and often more relevant measure of the vapour intrusion risk. Four flux chamber measurement locations fell within the two areas of substantial TCE soil vapour impact and in all cases vapour intrusion risks calculated from the flux measurements showed low and acceptable vapour intrusion risks.

Consideration of further evaluation of risks

The testing has shown a clear indication of the likely presence of a plume of TCE impact groundwater migrating southwards from the site. The presence and potential impacts of this apparent plume could be better defined through an assessment of groundwater.

Surface flux measurements on the natural surface of the road verge along Everard Avenue, coinciding with the area of high TCE concentrations measured in sub-slab soil vapour, indicate that the vapour intrusion risks are very low and acceptable for any building in the area. Greater certainty of this result (acceptable vapour intrusion risk) could be gained by measurement of the flux through the flooring of the buildings to the south of Everard Avenue. Ambient indoor air concentrations could also be collected as a further line of evidence in the evaluation of vapour intrusion risk for building occupants.

11. Limitations

Scope of Services

This soil vapour measurement report ('the report') has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and PB ('scope of services'). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the report, PB has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ('the data'). Except as otherwise stated in the report, PB has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ('conclusions') are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. PB will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to PB.

Environmental Conclusions

In accordance with the scope of services, PB has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil vapour, soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. PB assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of PB or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

PB will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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Figures



Figure 1 Sampling locations for surface mass flux and sub-slab soil vapour. Results for TCE, March 2014

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Figure 2 Sampling locations for surface mass flux and sub-slab soil vapour. Results for PCE, March 2014

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Appendix A

Flux Results - Summary Tables

Table A1Surface Flux Chambers: Mass on sampling tubesAshford Road, Everard Avenue, Croydon Road, Keswick; 18 March 2014

	Units	PQL	PF1	PF2	PF3	PF4	PF5	PF5dup	PF6	PF6 dup	PF7	PF8	PF9	PF10
Benzene	ng	5	17	18	19	19	21	26	20	14	29	26	100	<5
2-butanone(MEK)	ng	5	69	18	56	<5	<5	<5	<5	<5	<5	<5	<5	<5
n-Butylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	ng	5	<5	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cyclohexane	ng	5	<5	<5	<5	<5	6	8	<5	<5	11	<5	31	<5
n-Decane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	65	<5
Dibromochloromethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dibromoethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2,4-dimethylpentane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	<5
n-Dodecane	ng	5	<5	<5	<5	<5	<5	<5	<5	29	6	<5	60	<5
Ethylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	220	<5
Ethylcyclohexane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
n-Heptane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	47	<5
n-Hexane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	8	<5	120	5
Isopropanol	ng	50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Isopropylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	<5
4-Isopropyltoluene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	13	<5
2-Methyl butane	ng	5	26	19	13	33	47	67	28	19	62	24	300	100
Methyl tert-butyl ether	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylcyclohexane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	25	<5
2-Methylhexane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	35	<5
3-Methylhexane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	46	<5
2-Methylpentane	ng	5	5	<5	<5	<5	5	8	<5	<5	12	<5	120	20
3-Methylpentane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	45	7
Naphthalene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	18	<5
n-Nonane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	22	<5
n-Octane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	22	<5
n-Pentane	ng	5	12	8	6	13	22	31	11	11	30	9	220	61
propylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	23	<5
Tetrachloroethene	ng	5	7	<5	6	7	<5	<5	<5	<5	<5	<5	14	260
Toluene	ng	5	12	7	<5	9	8	8	8	7	11	6	850	6
1,1,1-trichloroethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2-trichloroethane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene	ng	5	<5	19	8	12	83	110	<5	<5	13	<5	32	<5
Trichloromethane	ng	5	<5	<5	<5	7	<5	<5	<5	<5	<5	<5	6	<5
1,2,4-Trimethylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	150	<5
1,3,5-Trimethylbenzene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	42	<5
n-Undecane	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	86	<5
Vinyl Chloride	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
o-Xylene	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	140	<5
m&p-Xylenes	ng	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	450	<5
TRH C ₆ -C ₁₀	μg	0.1	<0.1	0.1	<0.1	0.1	0.3	0.3	0.1	0.1	0.2	0.1	3.3	0.9
TRH >C ₁₀ -C ₁₆	μg	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.1	0.1	<0.1	1.9	<0.1
Notes:										i				<u>ا</u>

Notes: Bold: detected compound Chlorinated solvent compounds of interest



Table A2Surface flux of TCE and PCEAshford Road, Everard Avenue, Croydon Road, Keswick: 18 March 2014

Analyte	Units	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10
	ng/m²/h	nd	27.4	11.2	12.9	208.2	nd	14.5	nd	14.6	nd
Tetrachloroethene		9.8	nd	8.4	7.5	nd	nd	nd	nd	6.4	120

Appendix B

Sub-slab soil vapour – Summary table

Table B1

Sub-slab Soil Vapour Concentrations Ashford Road, Everard Avenue, Croydon Road Keswick; March 2014

	Units	SS1	SS2	SS3	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS18 dup	SS19	SS20	SS20 dup
Benzene	µg/m ³	<2.4	<2.4	<2.4	<2.4	15	<2.4	<2.4	<2.4	3.8	<2.4	<2.4	3.4	2.9	<2.4	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5
2-butanone(MEK)	$\mu g/m^3$	<4.6	7.3	5.5	<4.6	<4.6	<4.6	<4.6	<4.6	4.6	4.6	<4.6	<4.6	<4.6	<4.6	6.4	6.4	<4.7	<4.7	<4.7	<4.7	<4.7
n-Butylbenzene	$\mu g/m^3$	<0.88	<0.88	<0.88	<0.88	<0.88	1.2	<0.88	<0.88	<0.88	0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.91	<0.91	<0.91	<0.91	<0.91
Carbon tetrachloride	µg/m ³	<3.7	<3.7	<3.7	9	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7	4.5	<3.7	<3.7	<3.7	<3.7	<3.7	<3.9	<3.9	<3.9	<3.9	<3.9
Chloroethane	μg/m ³	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<6.1	<6.1	<6.1	<6.1	<6.1
Chloromethane	µg/m ³	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<6.1	<6.1	<6.1	<6.1	<6.1
Cyclohexane	µg/m ³	<3.1	8.8	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	4.4	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
n-Decane	µa/m ³	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<140	<140	<140	<140	<140
Dibromochloromethane	µg/m ³	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dibromoethane	µg/m ³	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.9	<1.9	<1.9	<1.9
Dichlorodifluoromethane	µg/m ³	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<32	<32	<33	<32	<32
1,1-Dichloroethane	µg/m ³	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<6.1	<6.1	<6.1	<6.1	<6.1
1,2-Dichloroethane	µg/m ³	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5
1,1-Dichloroethene	µg/m ³	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.2	<7.2	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene	µg/m3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.1	<3.1	<3.1	<3.1	<3.1
trans-1,2-Dichloroethene	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
2,4-dimethylpentane	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
n-Dodecane	µg/m ³	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<440	<460	<460	<460	<460	<460
Ethylbenzene	µg/m ³	<1.3	<1.3	<1.3	<1.3	2	<1.3	<1.3	<1.3	1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
n-Heptane	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
n-Hexane	µg/m ³	<63	65	<63	<63	<63	75	<63	<63	<63	<63	<63	<63	<63	<63	<63	71	<65	<65	<65	<65	73
Isopropanol	µg/m ³	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<470	<470	<470	<470	<470
Isopropylbenzene	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4	<1.4	<1.4	<1.4	<1.4
4-Isopropyltoluene	µg/m ³	<1.3	1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4	<1.4	<1.4	<1.4	<1.4
2-Methyl butane	µg/m ³	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<31	<32	<32	<33	<32	<32
Methyl tert-butyl ether	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
Methylcyclohexane	µg/m ³	<3.1	6.3	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	3.8	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
2-Methylhexane	µg/m³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
3-Methylhexane	µg/m³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
2-Methylpentane	µg/m³	<310	330	<310	<310	<310	390	<310	<310	<310	<310	<310	<310	<310	<310	<310	360	<320	<320	<330	<320	380
3-Methylpentane	µg/m°	<3.1	4.4	<3.1	<3.1	<3.1	3.8	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	3.8	<3.2	<3.2	<3.3	<3.2	3.9
Naphthalene	µg/m°	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.7	<1.7	<1.7	<1.7	<1.7
n-Nonane	μg/m ³	<1.3	6.6	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4	<1.4	<1.4	<1.4	<1.4
n-Octane	μg/m [°]	<3.1	3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.2	<3.2	<3.3	<3.2	<3.2
n-Pentane	μg/m ³	<63	<63	<63	<63	<63	64	<63	<63	<63	<63	<63	<63	<63	<63	<63	<63	<65	<65	<65	<65	<65
propylbenzene Tetrachloroethene	µg/m ³	<1.3	<1.3	<1.3 <1.4	<1.3	<1.3	1.8	<1.3	<1.3 3.2	<1.3	<1.3	<1.3 1.4	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4 8	<1.4 10	<1.4 8.9	<1.4 3	<1.4 3.2
Toluene	μg/m3 μg/m ³	7.7 3.2	<1.4 2.6	< <u>1.4</u> 1.6	<1.6	<mark><1.4</mark> 14	<1.4 3.6	1.7 1.6	<u>3.2</u> 1.6	<u>6.6</u> 9.4	<1.4 2.9	<1.6	<1.4 1.9	<1.4 <1.6	<1.4 <1.6	1.4 2.6	7.4 1.6	o <1.7	<1.7	<1.7	3 <1.7	3.2 <1.7
1.1.1-trichloroethane	μg/m μg/m ³	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.7	<4.7	<4.7	<4.7	<4.7
1,1,2-trichloroethane	μg/m μg/m ³	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.9	<1.9	<1.9	<1.9
Trichloroethene	μg/m μg/m3	<1.8	1.8	<1.8	<1.8	<1.8	<1.8	2.2	<1.8	100	40	<1.8	<1.8	5.5	1.8	2.2	150	640	790	2800	1000	1000
Trichloromethane	μg/m ³	<3.0	<3.0	<3.0	4.8	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.1	<3.1	<3.1	<3.1	<3.1
1,2,4-Trimethylbenzene	μg/m ³	1.2	7.8	<0.88	<0.88	1.4	5.8	<0.88	<0.88	1.9	<0.88	<0.88	<0.88	<0.88	<0.88	3.5	<0.88	<0.91	<0.91	<0.91	<0.91	<0.91
1,3,5-Trimethylbenzene	µg/m ³	<0.88	3.4	<0.88	<0.88	<0.88	1.8	<0.88	<0.88	0.88	<0.88	<0.88	< 0.88	< 0.88	<0.88	1.2	<0.88	<0.91	< 0.91	<0.91	< 0.91	<0.91
n-Undecane	µg/m ³	<3.5	30	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.6	<3.6	<3.6	<3.6	<3.6
Vinyl Chloride	µg/m3	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<12	<12	<12	<12	<12
o-Xylene	µg/m ³	<1.3	1.8	<1.3	<1.3	1.8	3.2	<1.3	<1.3	2.6	<1.3	<1.3	<1.3	<1.3	<1.3	1.9	<1.3	<1.4	<1.4	<1.4	<1.4	<1.4
m&p-Xylenes	µg/m ³	<1.3	3.4	<1.3	<1.3	9.3	3.2	<1.3	<1.3	8.2	2.6	<1.3	<1.3	<1.3	<1.3	1.9	<1.3	<1.4	<1.4	<1.4	<1.4	<1.4
TRH C ₆ -C ₁₀	µg/m ³	<480	850	630	<480	780	900	<480	<480	<480	490	<480	<480	<480	<480	530	940	650	1100	2700	1400	1800
$TRH > C_6 - C_{10}$	µg/m ³	<400	1200	510	<400	450	750	<400	<400	<400	440	<400	470	<400	<400	400	790	<410	560	<410	<400	700
$1.1.1 > 0_6 \circ_{10}$	µg/m			010																		

NOTE:

Compounds of interest

Table B1

Sub-slab Soil Vapour Concentrations Ashford Road, Everard Avenue, Croydon R Keswick; March 2014

	Units	SS21	SS22	SS23	SS24	SS25	SS26	SS27	SS27 dup	SS28	SS29	SS30	SS31	SS32	SS33	SS34	SS35	SS36	SS37	SS37
Benzene	µg/m ³	<2.5	<2.5	<2.5	<2.5	48	<2.5	<2.5	<2.5	<2.5	<2.5	5.4	<2.5	<2.5	<2.5	<2.5	<2.5	6.5	3	3.5
2-butanone(MEK)	$\mu g/m^3$	<4.7	7.6	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	4.7	<4.7	<4.7	<4.7	5.7	<4.7	<4.7	<4.8	<4.8	10	9.5
n-Butylbenzene	$\mu g/m^3$	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.92	<0.92	<0.9
Carbon tetrachloride	µg/m ³	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.
Chloroethane	µg/m ³	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.2	<6.2	<6.2	<6.
Chloromethane	µg/m ³	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.2	<6.2	<6.2	<6.
Cyclohexane	µg/m ³	<3.2	<3.3	<3.3	<3.3	5.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
n-Decane	µg/m ³	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<140	<14
Dibromochloromethane	µg/m ³	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.
1.2-Dibromoethane	µg/m ³	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.
Dichlorodifluoromethane	µg/m ³	<32	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<3
1,1-Dichloroethane	µg/m ³	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.2	<6.2	<6.2	<6.
1.2-Dichloroethane	µg/m ³	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.
1,1-Dichloroethene	μg/m ³	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.
cis-1,2-Dichloroethene	µg/m3	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	220	130	11(
trans-1,2-Dichloroethene	µg/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	19	7.8	7.2
2,4-dimethylpentane	ua/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
n-Dodecane	µg/m ³	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<460	<46
Ethylbenzene	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	3.2	3.5	6.4
Ethylcyclohexane	µg/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
n-Heptane	µg/m ³	<3.2	<3.3	<3.3	<3.3	3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
n-Hexane	µg/m ³	<65	100	<65	88	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<6
Isopropanol	µg/m ³	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<470	<480	<480	<480	<48
Isopropylbenzene	μg/m ³	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.
4-Isopropyltoluene	µg/m ³	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	1.6	<1.4	<1.
2-Methyl butane	μg/m ³	<32	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<33	<3
Methyl tert-butyl ether	µg/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
Methylcyclohexane	µg/m ³	<3.2	<3.3	<3.3	<3.3	14	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
2-Methylhexane	µg/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
3-Methylhexane	ua/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
2-Methylpentane	µg/m ³	<320	510	<330	440	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<33
3-Methylpentane	$\mu g/m^3$	<3.2	5.2	3.2	4.6	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
Naphthalene	µg/m ³	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.
n-Nonane	µg/m ³	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.
n-Octane	µg/m ³	<3.2	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.
n-Pentane	µg/m ³	<65	80	<65	67	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<65	<6
propylbenzene	µg/m ³	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.
Tetrachloroethene	µg/m3	3.6	2.1	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	67	72	51	7.1	13	19	6.2	4.5
Toluene	µg/m ³	<1.7	<1.7	<1.7	3	2	<1.7	<1.7	1.7	2.7	2.3	4.4	<1.7	1.7	2	3	1.7	6.7	5.7	7.4
1,1,1-trichloroethane	µg/m ³	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.8	6.7	<4.8	<4.
1,1,2-trichloroethane	µg/m ³	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.
Trichloroethene	µg/m3	520	170	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	4200	980	76
Trichloromethane	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	64	17	14
1,2,4-Trimethylbenzene	μg/m ³	<0.91	1.1	0.91	1.3	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	0.91	<0.91	<0.91	<0.91	<0.91	<0.91	1.5	0.92	<0.9
1,3,5-Trimethylbenzene	µg/m ³	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.91	<0.92	<0.92	<0.9
n-Undecane	µg/m ³	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.7	<3.7	<3.7	<3.
Vinyl Chloride	µg/m3	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	<1
o-Xylene	µg/m ³	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	1.9	<1.4	<1.
m&p-Xylenes	µg/m ³	<1.4	1.6	<1.4	2.5	1.6	<1.4	<1.4	<1.4	<1.4	<1.4	1.4	<1.4	<1.4	<1.4	1.9	<1.4	3.6	1.9	2.5
TRH C ₆ -C ₁₀	µg/m ³	590	1200	660	1000	<480	<480	<480	<480	<480	<480	<480	<480	600	<480	<480	<500	4300	1400	900
$TRH > C_6 \cdot C_{10}$	$\mu g/m^3$	<400	990	540	840	<400	<400	<400	<400	440	400	420	<400	510	<400	410	<410	<410	610	<41

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Table B2Relative Percent Differences for Sub-slab Vapour Duplicate SamplesAshford Road, Everard Avenue, Croydon Road, Keswick; March 2014

	Units	SS18	SS18 dup	RPD (%)	SS20	SS20 dup	RPD (%)	SS27	SS27 dup	RPD (%)	SS37	SS37 dup	RPD (%)
Benzene	µg/m ³	<2.5	<2.5	-	<2.5	<2.5	-	<2.5	<2.5	-	3	3.5	15%
2-butanone(MEK)	µg/m ³	<4.7	<4.7	-	<4.7	<4.7	-	<4.7	<4.7	-	10	9.5	5%
n-Butylbenzene	µg/m ³	<0.91	<0.91	-	<0.91	<0.91	-	<0.91	<0.91	-	<0.92	<0.92	-
Carbon tetrachloride	µg/m ³	<3.9	<3.9	-	<3.9	<3.9	-	<3.9	<3.9	-	<3.9	<3.9	-
Chloroethane	µg/m ³	<6.1	<6.1	-	<6.1	<6.1	-	<6.1	<6.1	-	<6.2	<6.2	-
Chloromethane	µg/m ³	<6.1	<6.1	-	<6.1	<6.1	-	<6.1	<6.1	-	<6.2	<6.2	-
Cyclohexane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
n-Decane	µg/m ³	<140	<140	-	<140	<140	-	<140	<140	-	<140	<140	-
Dibromochloromethane	µg/m ³	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-
1,2-Dibromoethane	µg/m ³	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-
Dichlorodifluoromethane	µg/m ³	<32	<32	-	<32	<32	-	<33	<33	-	<33	<33	-
1,1-Dichloroethane	µg/m ³	<6.1	<6.1	-	<6.1	<6.1	-	<6.1	<6.1	-	<6.2	<6.2	-
1,2-Dichloroethane	µg/m ³	<2.5	<2.5	-	<2.5	<2.5	-	<2.5	<2.5	-	<2.5	<2.5	-
1,1-Dichloroethene	µg/m ³	<7.2	<7.2	-	<7.2	<7.2	-	<7.2	<7.2	-	<7.2	<7.2	-
cis-1,2-Dichloroethene	µg/m ³	<3.1	<3.1	-	<3.1	<3.1	-	<3.1	<3.1	-	130	110	17%
trans-1,2-Dichloroethene	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	7.8	7.2	8%
2,4-dimethylpentane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
n-Dodecane	µg/m ³	<460	<460	-	<460	<460	-	<460	<460	-	<460	<460	-
Ethylbenzene	µg/m ³	<1.3	<1.3	-	<1.3	<1.3	-	<1.3	<1.3	-	3.5	6.4	59%
Ethylcyclohexane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
n-Heptane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
n-Hexane	µg/m ³	<65	<65	-	65	73	12%	<65	<65	-	<65	<65	-
Isopropanol	µg/m ³	<470	<470	-	<470	<470	-	<470	<470	-	<480	<480	-
Isopropylbenzene	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-
4-Isopropyltoluene	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-
2-Methyl butane	µg/m ³	<32	<32	-	<32	<32	-	<33	<33	-	<33	<33	-
Methyl tert-butyl ether	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
Methylcyclohexane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
2-Methylhexane	µg/m³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
3-Methylhexane	µg/m³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
2-Methylpentane	µg/m ³	<320	<320	-	320	380	17%	<330	<330	-	<330	<330	-
3-Methylpentane	µg/m ³	<3.2	<3.2	-	3.2	3.9	20%	<3.3	<3.3	-	<3.3	<3.3	-
Naphthalene	µg/m ³	<1.7	<1.7	-	<1.7	<1.7	-	<1.7	<1.7	-	<1.7	<1.7	-
n-Nonane	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-
n-Octane	µg/m ³	<3.2	<3.2	-	<3.2	<3.2	-	<3.3	<3.3	-	<3.3	<3.3	-
n-Pentane	µg/m ³	<65	<65	-	<65	<65	-	<65	<65	-	<65	<65	-
propylbenzene	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-
Tetrachloroethene	µg/m ³	8	10	22%	3	3.2	6%	<1.5	<1.5	-	6.2	4.5	32%
Toluene	µg/m ³	<1.7	<1.7	-	<1.7	<1.7	-	<1.7	1.7	-	5.7	7.4	26%
1,1,1-trichloroethane	µg/m ³	<4.7	<4.7	-	<4.7	<4.7	-	<4.7	<4.7	-	<4.8	<4.8	-
1,1,2-trichloroethane	µg/m ³	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-	<1.9	<1.9	-
Trichloroethene	µg/m ³	640	790	21%	1000	1000	0%	<1.9	<1.9	-	980	760	25%
Trichloromethane	µg/m ³	<3.1	<3.1	-	<3.1	<3.1	-	<3.1	<3.1	-	17	14	19%
1,2,4-Trimethylbenzene	µg/m ³	<0.91	<0.91	-	<0.91	<0.91	-	<0.91	<0.91	-	0.92	0.92	0%
1,3,5-Trimethylbenzene	µg/m³	<0.91	<0.91	-	<0.91	<0.91	-	<0.91	<0.91	-	<0.92	<0.92	
n-Undecane	µg/m³	<3.6	<3.6	-	<3.6	<3.6		<3.6	<3.6		<3.7	<3.7	
Vinyl Chloride	µg/m ³	<12	<12	-	<12	<12	-	<12	<12	-	<12	<12	
o-Xylene	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	
m&p-Xylenes	µg/m ³	<1.4	<1.4	-	<1.4	<1.4	-	<1.4	<1.4	-	1.9	2.5	27%
TRH C ₆ -C ₁₀	µg/m ³	650	1100	51%	1400	1800	25%	<480	<480	-	1400	900	43%
$TRH > C_6 - C_{10}$	µq/m ³	410	560	31%	400	700	55%	<400	<400	-	610	410	39%

Italics: A value equal to the PQL has been used for the calculation of RPDs

Table B3 Trip blank (mass on tube (μg)) Ashford Road, Everard Avenue, Croydon Road, Keswick; March 2014

	Units	PQL	Trip Blank 1	Trip Blank 2
Benzene		0.05		тпр Біалк 2 <0.05
2-butanone(MEK)	µg total	0.05	<0.05	
	µg total		< 0.05	< 0.05
n-Butylbenzene	µg total	0.05	< 0.05	< 0.05
Carbon tetrachloride Chloroethane	µg total	0.05	<0.05	< 0.05
	µg total	0.05	<0.05	< 0.05
Chloromethane	µg total	0.05	<0.05	< 0.05
Cyclohexane	µg total	0.05	<0.05	<0.05
n-Decane	µg total	5	<5	<5
Dibromochloromethane	µg total	0.05	<0.05	<0.05
1,2-Dibromoethane	µg total	0.05	<0.05	<0.05
Dichlorodifluoromethane	µg total	0.05	<0.05	<0.05
1,1-Dichloroethane	µg total	0.05	<0.05	<0.05
1,2-Dichloroethane	µg total	0.05	<0.05	< 0.05
1,1-Dichloroethene	µg total	0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg total	0.05	<0.05	<0.05
trans-1,2-Dichloroethene	µg total	0.05	<0.05	<0.05
2,4-dimethylpentane	µg total	0.05	<0.05	<0.05
n-Dodecane	µg total	25	<25	<25
Ethylbenzene	µg total	0.05	<0.05	<0.05
Ethylcyclohexane	µg total	0.05	<0.05	<0.05
n-Heptane	µg total	0.05	<0.05	<0.05
n-Hexane	µg total	1	<1	<1
Isopropanol	µg total	0.05	<0.05	<0.05
Isopropylbenzene	µg total	0.05	<0.05	<0.05
4-Isopropyltoluene	µg total	0.05	<0.05	<0.05
2-Methyl butane	µg total	0.5	<0.5	<0.5
Methyl tert-butyl ether	µg total	0.05	<0.05	<0.05
Methylcyclohexane	µg total	0.05	<0.05	<0.05
2-Methylhexane	µg total	0.05	<0.05	<0.05
3-Methylhexane	µg total	0.05	<0.05	<0.05
2-Methylpentane	µg total	5	<5	<5
3-Methylpentane	µg total	0.05	<0.05	<0.05
Naphthalene	µg total	0.05	<0.05	<0.05
n-Nonane	µg total	0.05	<0.05	<0.05
n-Octane	µg total	0.05	<0.05	<0.05
n-Pentane	µg total	1	<1	<1
propylbenzene	µg total	0.05	<0.05	<0.05
Tetrachloroethene	µg total	0.05	<0.05	<0.05
Toluene	µg total	0.05	<0.05	<0.05
1,1,1-trichloroethane	µg total	0.05	<0.05	<0.05
1,1,2-trichloroethane	µg total	0.05	<0.05	<0.05
Trichloroethene	µg total	0.05	<0.05	<0.05
Trichloromethane	µg total	0.05	<0.05	<0.05
1,2,4-Trimethylbenzene	µg total	0.05	<0.05	< 0.05
1,3,5-Trimethylbenzene	µg total	0.05	<0.05	<0.05
n-Undecane	µg total	0.2	<0.2	<0.2
Vinyl Chloride	µg total	0.05	<0.05	<0.05
o-Xylene	µg total	0.05	<0.05	< 0.05
m&p-Xylenes	µg total	0.05	<0.05	<0.05
TRH C ₆ -C ₁₀	µg total	15	<15	<15
$TRH > C_6 \text{-} C_{10}$	µg total	15	<15	<15

Appendix C

Daily Weather Observations – Adelaide Airport, March 2014

Adelaide Airport, South Australia March 2014 Daily Weather Observations

Observations are made about 1 km east of the coast.



Australian Government

Bureau of Meteorology

		Tem	nps	Rain	Evap	Sun	Max	wind g	ust			9	am					3	om		
Date	Day	Min	Max	Rain	Evap	Sun	Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Sa	13.8	26.4	0	7.2	11.9	ESE	39	09:38	17.3	64	1	SE	20	1022.2	24.9	38	1	S	22	1019.8
2		14.1	29.1	0	5.8	11.4	SW	35	13:33	20.1	63	1	SW	4	1021.2	26.2	51	1	SW	30	1019.6
3		12.9	28.5	0		11.5	SSW	31	16:33	21.1	55	0	N	2	1021.7	25.1	57	1	SW	20	1019.4
4	- Tu	16.3	34.0	0	6.8	6.0	WSW	41	19:04	23.8	61	1		Calm	1018.5	32.6	27	1	WNW	13	1016.0
5	-	17.5	24.3	0	7.2	11.1				20.5	66	1	SE	19	1019.2	22.4	51	3	S	30	1019.0
6		13.0	24.3	0	7.0	11.2	SSE	48	17:53	17.2	47	0	E	15	1021.5	23.2	34	1	ESE	17	1019.2
7	· · · ·	12.8	24.4	0	7.2	11.3	SE	41	00:39	16.5	51	1	ESE	20	1024.5	22.7	35	1	SE	20	1021.8
8		13.6	27.3	0	7.4	11.4	ESE	31	00:03	19.8	62	1		Calm	1020.2	25.6	45	1	SW	20	1016.1
9		18.2	35.2	0	6.2	10.4	SW	48	16:29	25.3	40	1	NNW	7	1014.7	34.8	18	6	WNW	17	1012.7
10		18.2	35.0	0	6.8	0.9	NW	30	13:02	25.6	43	7	ENE	11	1016.8	28.1	49	7	SSW	11	1015.9
11	-	21.6	31.8	0	5.0	2.5	W	59	04:54	24.8	61	7	ESE	13	1016.6	23.6	73	7	ESE	15	1016.8
12	1 1	14.2	22.1	1.6	3.6	11.7	SW	43	13:47	18.3	64	3	SSE	19	1022.9	20.7	50	1	SW	31	1021.6
13	1 1	10.4	22.7	0	6.8	10.1	SW	31	15:45	17.2	62	6		Calm	1020.7	22.3	49	7	SW	20	1017.1
14	1 1	10.9	27.3	0	4.2	5.0	NE	26	21:56	15.4	74	7		Calm	1014.0	23.9	40	7	WNW	11	1010.8
15		15.4	22.5	2.4	4.6	5.3	WSW	72	18:46	19.9	79	7	WSW	31	1006.2	19.2	59	7	WSW	39	1006.6
16		14.4	21.6	1.6	6.2	6.2	SW	52	07:35	16.9	60	6	W	31	1011.1	20.4	51	7	W	20	1011.3
17		16.9	23.1	11.4	5.0	3.4	WNW	50	00:49	19.3	76	8	W	15	1015.4	19.7	90	8	WSW	26	1016.2
18	Tu	17.6	23.1	1.2	2.6	7.7	SW	30	10:14	18.9	87	7	N	9	1021.5	22.0	70	3	WSW	15	1021.9
19	1 1	13.6	22.5	0	4.2	11.3	SSW	33	16:03	17.6	73	1	NNE	7	1026.9	21.3	60	0	WSW	20	1024.5
20	Th	13.1	30.7	0	4.4	11.4	N	31	11:18	19.6	58	1	NNE	9	1021.3	28.1	37	6	W	15	1017.6
21	Fr	17.6	21.4	0	6.4	7.3	S	57	08:48	17.6	69	7	S	33	1020.0	18.8	48	5	S	28	1021.8
22	1 1	11.3	21.5	0	6.0	10.7	SSE	39	17:32	14.5	49	2	SE	15	1023.7	20.3	40	6	WSW	26	1020.3
23	1 1	13.2	20.5	0	6.8	10.7	SW	48	12:39	14.7	60	7	SSE	13	1022.5	18.6	43	7	SW	30	1022.2
24	1 1	10.1	22.1	2.8	3.2	7.3	S	37	14:09	13.9	96	5		9	1023.3	22.0	50	6	S	20	1021.0
25		13.1	20.5	0	3.6	1.7	SSE	39	13:46	15.5	64	7	SSE	15	1024.0	20.0	50	7	S	26	1021.4
26		13.5	26.7	0	2.0	8.5	SE	37	17:50	18.4	71	5	SSW	6	1021.1	22.8	68	3	WSW	24	1017.9
27	Th	14.0	26.2	0	4.6	10.5	SW	33	15:57	20.1	72	6	ENE	7	1017.1	25.2	45	2	SW	20	1014.1
28	Fr	15.0	23.9	0	4.2	8.2	WSW	30	13:04	19.2	74	2	E	7	1017.0	21.9	71	5	SW	22	1015.7
29	Sa	16.5	23.4	0	3.8	10.4	SW	30	13:57	19.7	75	5	NNW	7	1017.1	22.1	75	1	WSW	24	1015.8
30		11.8	32.4	0	4.0	9.8	NW	28	14:28	17.2	75	6		9	1018.5	31.1	27	7	NW	17	1016.0
31	_	17.2	32.4	0	7.0	0.7	NNE	28	11:56	25.8	40	7	NE	13	1016.8	30.4	26	7	N	13	1014.6
Statisti	cs for Ma																				
	Mean	14.6	26.0		5.4	8.3				19.1	64	4		11	1019.3	23.9	49	4		21	1017.6
	Lowest	10.1	20.5		2.0	0.7				13.9	40	0		Calm	1006.2	18.6	18	0	#	11	1006.6
	Highest	21.6	35.2	11.4	7.4	11.9	WSW	72		25.8	96	8	S	33	1026.9	34.8	90	8	WSW	39	1024.5
	Total			21.0	166.8	257.5										CJDW5001				_	

Observations were drawn from Adelaide Airport {station 023034}

Climate averages are based on the 1955-2003 Airport record from a site 1 kilometres further inland than the existing site. Daily maximum and minimum temperatures are within a degree - with the current site being slightly more moderate. There is little variation in rainfall at the two sites.

IDCJDW5001.201403 Prepared at 13:06 UTC on 7 Apr 2014 Copyright © 2014 Bureau of Meteorology

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Adelaide Airport, South Australia April 2014 Daily Weather Observations

Observations are made about 1 km east of the coast.



Australian Government

Hereau of Meteorology

		Tem	ps	Rain	Evap	Sun	Max	wind g	ust			9a	m					3p	om		
Date	Day	Min	Max	Rain	Evap	Sun	Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Tu	19.3	35.1	0	4.8	7.9	NNW	48	12:36	27.2	32	1	NE	15	1012.7	34.2	19	5	NNW	33	1008.2
2	We	18.0	22.5	0.2	8.8	5.1	SW	41	15:16	18.3	67	7	S	17	1016.4	20.3	56	7	SW	30	1015.7
3	Th	14.9	22.1	0	5.4	4.7	SSE	37	11:47	16.5	61	7	S	17	1022.1	19.8	49	7	ESE	20	1020.7
4	Fr	11.8	21.9	0	4.8	10.5	SSE	39	16:01	15.5	67	1	SE	17	1023.3	20.3	35	1	SE	13	1021.0
5	Sa	9.2	21.5	0	5.6	10.7	WSW	44	15:18	14.6	61	1	N	7	1024.5	19.5	46	1	SSW	24	1022.0
6	Su	8.0	23.6	0	4.6	9.7	SW	26	14:20	16.7	62	2	S	6	1023.7	21.4	46	5	SW	20	1019.2
7	Мо	16.1	28.0	0	5.4	1.2	NE	48	20:49	23.6	30	8	NE	19	1017.0	23.3	50	8	SSE	7	1014.2
8	Tu	19.0	23.1	0.4	4.6	0.0	N	20	08:29	21.0	84	8	N	17	1016.0	21.1	88	8	SW	9	1014.6
9	We	18.6	22.1	6.8	1.8	0.0	E	24	17:09	19.3	89	8	SSE	9	1015.8	21.0	80	8	WSW	13	1012.7
10	Th	18.9	23.5	0.2	1.0	1.9	SE	39	13:18	21.2	76	7	SSE	17	1011.2	22.2	64	7	S	22	1010.4
11	Fr	15.6		0	3.2					17.1	71	7	S	24	1018.7						
Statistic	s for the	first 11	days of	April 20	14																
	Mean	15.4	24.3		4.5	5.2				19.2	63	5		15	1018.3	22.3	53	5		19	1015.9
	Lowest	8.0	21.5		1.0	0.0				14.6	30	1	S	6	1011.2	19.5	19	1	SSE	7	1008.2
	Highest	19.3	35.1	6.8	8.8	10.7	#	48		27.2	89	8	S	24	1024.5	34.2	88	8	NNW	33	1022.0
	Total			7.6	50.0	51.7															

Observations were drawn from Adelaide Airport {station 023034}

Climate averages are based on the 1955-2003 Airport record from a site 1 kilometres further inland than the existing site. Daily maximum and minimum temperatures are within a degree - with the current site being slightly more moderate. There is little variation in rainfall at the two sites.

IDCJDW5001.201404 Prepared at 01:00 UTC on 11 Apr 2014 Copyright © 2014 Bureau of Meteorology

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Appendix D

Laboratory Report - Flux





A.B.N. 44 000 964 278 3 - 5, 18 Redland Drive Mitcham, Vic, 3132 Telephone: (03) 9874 1988 Fax: (03) 9874 1933

Chartered Chemists

3-Apr-2014

Parsons Brinckerhoff

Ernst & Young Centre Level 27/680 George Street Sydney NSW 2000 Attention: Adrian Heggie

REPORT NUMBER: M140475

Site/Client Ref: 2201557a

CERTIFICATE OF ANALYSIS

SAMPLES: Thirteen samples were received for analysis

DATE RECEIVED:

DATE COMMENCED:

METHODS:

See Attached Results

25-Mar-2014

25-Mar-2014

RESULTS:

Please refer to attached pages for results.

Note: Results are based on samples as received at SGS Leeder Consulting's laboratories

REPORTED BY:

Evan Jones Manager



NATA Accredited Laboratory Number: 14429

Accredited for compliance with ISO/IEC 17025.





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003721	2014003722	2014003723	2014003724	2014003725
	Client ID	PF1 OM500	PF2 OM501	PF3 OM502	PF4 OM503	PF5 OM504
Analyte Name	PQL					
Benzene	5	17	18	19	19	21
2-butanone(MEK)	5	nd	nd	nd	nd	nd
n-Butylbenzene	5	nd	nd	nd	nd	nd
Carbon tetrachloride	5	nd	nd	nd	8	nd
Chloroethane	5	nd	nd	nd	nd	nd
Chloromethane	5	nd	nd	nd	nd	nd
Cyclohexane	5	nd	nd	nd	nd	6
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	5	nd	nd	nd	nd	nd
1,2-Dibromoethane	5	nd	nd	nd	nd	nd
Dichlorodifluoromethane	5	nd	nd	nd	nd	nd
1,1-Dichloroethane	5	nd	nd	nd	nd	nd
1,2-Dichloroethane	5	nd	nd	nd	nd	nd
1,1-Dichloroethene	5	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	5	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	5	nd	nd	nd	nd	nd
2,4-dimethylpentane	5	nd	nd	nd	nd	nd
n-Dodecane	5	nd	nd	nd	nd	nd
Ethylbenzene	5	nd	nd	nd	nd	nd
Ethylcyclohexane	5	nd	nd	nd	nd	nd
n-Heptane	5	nd	nd	nd	nd	nd
n-Hexane	5	nd	nd	nd	nd	nd
Isopropanol	50	nd	nd	nd	nd	nd
Isopropylbenzene	5	nd	nd	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003721	2014003722	2014003723	2014003724	2014003725
	Client ID	PF1 OM500	PF2 OM501	PF3 OM502	PF4 OM503	PF5 OM504
Analyte Name	PQL					
4-Isopropyltoluene	5	nd	nd	nd	nd	nd
2-Methyl butane	5	26	19	13	33	47
Methyl tert-butyl ether	5	nd	nd	nd	nd	nd
Methylcyclohexane	5	nd	nd	nd	nd	nd
2-Methylhexane	5	nd	nd	nd	nd	nd
3-Methylhexane	5	nd	nd	nd	nd	nd
2-Methylpentane	5	5	nd	nd	nd	5
3-Methylpentane	5	nd	nd	nd	nd	nd
Naphthalene	5	nd	nd	nd	nd	nd
n-Nonane	5	nd	nd	nd	nd	nd
n-Octane	5	nd	nd	nd	nd	nd
n-Pentane	5	12	8	6	13	22
propylbenzene	5	nd	nd	nd	nd	nd
Tetrachloroethene	5	7	nd	6	7	nd
Toluene	5	12	7	nd	9	8
1,1,1-trichloroethane	5	nd	nd	nd	nd	nd
1,1,2-trichloroethane	5	nd	nd	nd	nd	nd
Trichloroethene	5	nd	19	8	12	83
Trichloromethane	5	nd	nd	nd	7	nd
1,2,4-Trimethylbenzene	5	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	5	nd	nd	nd	nd	nd
n-Undecane	5	nd	nd	nd	nd	nd
Vinyl Chloride	5	nd	nd	nd	nd	nd
o-Xylene	5	nd	nd	nd	nd	nd
m&p-Xylenes	5	nd	nd	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003726	2014003727	2014003728	2014003729	2014003730
	Client ID	PF5 Field dup PR410	PF6 PR411	PF6 Field dup PR412	PF7 PR413	PF8 PR414
Analyte Name	PQL					
Benzene	5	26	20	14	29	26
2-butanone(MEK)	5	nd	nd	nd	nd	nd
n-Butylbenzene	5	nd	nd	nd	nd	nd
Carbon tetrachloride	5	nd	nd	nd	nd	nd
Chloroethane	5	nd	nd	nd	nd	nd
Chloromethane	5	nd	nd	nd	nd	nd
Cyclohexane	5	8	nd	nd	11	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	5	nd	nd	nd	nd	nd
1,2-Dibromoethane	5	nd	nd	nd	nd	nd
Dichlorodifluoromethane	5	nd	nd	nd	nd	nd
1,1-Dichloroethane	5	nd	nd	nd	nd	nd
1,2-Dichloroethane	5	nd	nd	nd	nd	nd
1,1-Dichloroethene	5	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	5	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	5	nd	nd	nd	nd	nd
2,4-dimethylpentane	5	nd	nd	nd	nd	nd
n-Dodecane	5	nd	nd	29	6	nd
Ethylbenzene	5	nd	nd	nd	nd	nd
Ethylcyclohexane	5	nd	nd	nd	nd	nd
n-Heptane	5	nd	nd	nd	nd	nd
n-Hexane	5	nd	nd	nd	8	nd
Isopropanol	50	nd	nd	nd	nd	nd
Isopropylbenzene	5	nd	nd	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003726	2014003727	2014003728	2014003729	2014003730
	Client ID	PF5 Field dup PR410	PF6 PR411	PF6 Field dup PR412	PF7 PR413	PF8 PR414
Analyte Name	PQL					
4-Isopropyltoluene	5	nd	nd	nd	nd	nd
2-Methyl butane	5	67	28	19	62	24
Methyl tert-butyl ether	5	nd	nd	nd	nd	nd
Methylcyclohexane	5	nd	nd	nd	nd	nd
2-Methylhexane	5	nd	nd	nd	nd	nd
3-Methylhexane	5	nd	nd	nd	nd	nd
2-Methylpentane	5	8	nd	nd	12	nd
3-Methylpentane	5	nd	nd	nd	nd	nd
Naphthalene	5	nd	nd	nd	nd	nd
n-Nonane	5	nd	nd	nd	nd	nd
n-Octane	5	nd	nd	nd	nd	nd
n-Pentane	5	31	11	11	30	9
propylbenzene	5	nd	nd	nd	nd	nd
Tetrachloroethene	5	nd	nd	nd	nd	nd
Toluene	5	8	8	7	11	6
1,1,1-trichloroethane	5	nd	nd	nd	nd	nd
1,1,2-trichloroethane	5	nd	nd	nd	nd	nd
Trichloroethene	5	110	nd	nd	13	nd
Trichloromethane	5	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	5	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	5	nd	nd	nd	nd	nd
n-Undecane	5	nd	nd	nd	nd	nd
Vinyl Chloride	5	nd	nd	nd	nd	nd
o-Xylene	5	nd	nd	nd	nd	nd
m&p-Xylenes	5	nd	nd	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003731	2014003732	2014003733	2014003735
	Client ID	PF9 TH844	PF10 TH845	Trip Blank TH846	Method
analyte Name	PQL				Blank
Benzene	5	100	nd	nd	nd
2-butanone(MEK)	5	nd	nd	nd	nd
n-Butylbenzene	5	nd	nd	nd	nd
Carbon tetrachloride	5	nd	nd	nd	nd
Chloroethane	5	nd	nd	nd	nd
Chloromethane	5	nd	nd	nd	nd
Cyclohexane	5	31	nd	nd	nd
n-Decane	5	65	nd	nd	nd
Dibromochloromethane	5	nd	nd	nd	nd
1,2-Dibromoethane	5	nd	nd	nd	nd
Dichlorodifluoromethane	5	nd	nd	nd	nd
1,1-Dichloroethane	5	nd	nd	nd	nd
1,2-Dichloroethane	5	nd	nd	nd	nd
1,1-Dichloroethene	5	nd	nd	nd	nd
cis-1,2-Dichloroethene	5	nd	nd	nd	nd
trans-1,2-Dichloroethene	5	nd	nd	nd	nd
2,4-dimethylpentane	5	11	nd	nd	nd
n-Dodecane	5	60	nd	nd	nd
Ethylbenzene	5	220	nd	nd	nd
Ethylcyclohexane	5	nd	nd	nd	nd
n-Heptane	5	47	nd	nd	nd
n-Hexane	5	120	5	nd	nd
Isopropanol	50	nd	nd	nd	nd
Isopropylbenzene	5	9	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

	Leeder ID	2014003731	2014003732	2014003733	2014003735
	Client ID	PF9 TH844	PF10 TH845	Trip Blank TH846	Method
Analyte Name	PQL				Blank
4-Isopropyltoluene	5	13	nd	nd	nd
2-Methyl butane	5	300	100	nd	nd
Methyl tert-butyl ether	5	nd	nd	nd	nd
Methylcyclohexane	5	25	nd	nd	nd
2-Methylhexane	5	35	nd	nd	nd
3-Methylhexane	5	46	nd	nd	nd
2-Methylpentane	5	120	20	nd	nd
3-Methylpentane	5	45	7	nd	nd
Naphthalene	5	18	nd	nd	nd
n-Nonane	5	22	nd	nd	nd
n-Octane	5	22	nd	nd	nd
n-Pentane	5	220	61	nd	nd
propylbenzene	5	23	nd	nd	nd
Tetrachloroethene	5	14	260	nd	nd
Toluene	5	850	6	nd	nd
1,1,1-trichloroethane	5	nd	nd	nd	nd
1,1,2-trichloroethane	5	nd	nd	nd	nd
Trichloroethene	5	32	nd	nd	nd
Trichloromethane	5	6	nd	nd	nd
1,2,4-Trimethylbenzene	5	150	nd	nd	nd
1,3,5-Trimethylbenzene	5	42	nd	nd	nd
n-Undecane	5	86	nd	nd	nd
Vinyl Chloride	5	nd	nd	nd	nd
o-Xylene	5	140	nd	nd	nd
m&p-Xylenes	5	450	nd	nd	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17 TPH.04

Sample units are expressed in µg total

]	Leeder ID		2014003722	2014003723	2014003724	2014003725
Client ID		PF1 OM500	PF2 OM501	PF3 OM502	PF4 OM503	PF5 OM504
Analyte Name	PQL					
C6-C10	0.1	nd	0.1	nd	0.1	0.3
>C10-C16	0.1	0.3	nd	nd	nd	nd

Matrix: Thermal Desorption Radiello

Method: TO-17 TPH.04

	Leeder ID		2014003727	2014003728	2014003729	2014003730
	Client ID	PF5 Field dup PR410	PF6 PR411	PF6 Field dup PR412	PF7 PR413	PF8 PR414
Analyte Name	PQL					
C6-C10	0.1	0.3	0.1	0.1	0.2	0.1
>C10-C16	0.1	nd	nd	2.1	0.1	nd





Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17 TPH.04

I	Leeder ID	2014003731	2014003732	2014003733	2014003735
	Client ID	PF9 TH844	PF10 TH845	Trip Blank TH846	Method
Analyte Name	PQL				Blank
C6-C10	0.1	3.3	0.9	nd	nd
>C10-C16	0.1	1.9	nd	nd	nd





(II) QUALITY CONTROL

Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2014003736	2014003737
	Client ID	Method	Method
Analyte Name	PQL	Ger'lee	Calles Dara
	`	Spike	Spike Dup
Benzene		89	93
2-butanone(MEK)		97	100
Carbon tetrachloride		96	100
Cyclohexane		90	94
n-Decane		86	88
Dibromochloromethane		91	97
1,2-Dichloroethane		91	93
1,1-Dichloroethene		94	97
trans-1,2-Dichloroethene		95	99
Ethylbenzene		91	92
Ethylcyclohexane		89	93
n-Heptane		90	94
n-Hexane		85	91





(II) QUALITY CONTROL

Report N°: M140475

Matrix: Thermal Desorption Radiello

Method: TO-17.09 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2014003736	2014003737
	Client ID	Method	Method
A . A . A . A.	DOL		
Analyte Name	PQL	Spike	Spike Dup
Methyl tert-butyl ether		93	97
Methylcyclohexane		90	96
Tetrachloroethene		96	102
Toluene		95	99
1,1,1-trichloroethane		90	95
1,1,2-trichloroethane		97	100
Trichloroethene		92	96
Trichloromethane		93	94
n-Undecane		88	89
Vinyl Chloride		77	78
o-Xylene		98	100
m&p-Xylenes		98	99

Matrix: Thermal Desorption Radiello

Method: TO-17 TPH.04

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2014003736	2014003737
	Client ID	Method	Method
Analyte Name	PQL	Spike	Spike Dup
C6-C10		85	86
>C10-C16		94	97

Report N°: M140475



QUALIFIERS / NOTES FOR REPORTED RESULTS

- PQL Practical Quantitation Limit
- is Insufficient Sample to perform this analysis.
- T Tentative identification based on computer library search of mass spectra.
- ND Not Detected The analyte was not detected above the reported PQL.
- NC Not calculated, Results below PQL
- nr Not Requested for analysis.
- R Rejected Result results for this analysis failed QC checks.
- SQ Semi-Quantitative result quantitation based on a generic response factor for this class of analyte.
- IM Inappropriate method of analysis for this compound
- U Unable to provide Quality Control data high levels of compounds in sample interfered with analysis of QC results.
- UF Unable to provide Quality Control data- Surrogates failed Q Cchecks due to sample matrix effects
- L Analyte detected at a level above the linear response of calibration curve.
- E Estimated result. NATA accreditation does not cover estimated results.
- C1 These compounds co-elute.
- C2 These compounds co-elute.
- CT Elevated concentration. Results reported from carbon tube analysis
- ** Sample shows non-petroleum hydrocarbon profile

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APPENDIX ONE.

CHAIN OF CUSTODY DOCUMENT

	Passive Sample Collection	on										
Mitcham	Redland Drive VIC 3132 874 1988 Fax: (03) 9874 193	33			S	G	S	-&-	F	Page 2	1 of :	1
Collected	lanager: Adrian Heggie by: (Print and Sign) Adrian H Parsons Brinckerhoff 680 George Street NSW Post Code 2000 (02) 9272 5693 Fax:	Email aheggie City SYDNEY	@pb.com.au 		Project Info Purchase Ord Suburb & Stat	er Number: e: Keswick er: 2201557a		Turn Around Time Normal:YES Rapid:(days)	Air	r Air	Workplace Monitoring	Other (Passive Flux)
Lab ID	Field Sample I.D.	(Location)	Sampler I.D (WMS Code)		Time of Deployment	Date of Retrieval	Time of Retrieval	Analysis Required	Indoor Air	Outdoor Air	Workpla	Other (F
	PF1		OM500	19-Mar-14		19-Mar-14		VOCs for Radiello TDs				х
	PF2		OM 501	19-Mar-14		19-Mar-14		Adrian's analyte suite				х
	PF3		OM 502	19-Mar-14		19-Mar-14		(i.e. ACH suite)	┣──			x
	PF4 PF5		OM503 OM504	19-Mar-14 19-Mar-14		19-Mar-14 19-Mar-14		Report mass on tube	I —			X
	PF5 dup		PR410			19-Mar-14 19-Mar-14						x
				19-Mar-14				NOT concentrations		┣━┛		х
	PF6		PR411	19-Mar-14		19-Mar-14			_			х
L	PF6 dup PF7		PR412 PR413	19-Mar-14 19-Mar-14		19-Mar-14 19-Mar-14				┢──┤		X
	PF8		PR415	19-Mar-14		19-Mar-14			├		\vdash	X
											\vdash	х
	PF9		TH844	19-Mar-14		20-Mar-14				┣──┤		x
	PF10 TRIP BLANK		TH845	19-Mar-14	09:24	20-Mar-14	08:32					x
											\vdash	
			 									
Relinquis	hed By: (Signature) Date/Tir	ne Heggie	23 24 Mar 14	Received by:	sievens 7	Date/Time	2513114 10:30 m	Air Temp and Weather De	escrip	tion:		
Relinquis	hed By: (Signature) Date/Tir	me		Received by:	(Signature)	Date/Time		Notes: The unlabelled tub blank the carbon came ou				
Relinquis	hed By: (Signature) Date/Tir	me		Received by:	(Signature)	Date/Time		don't analyse it.		0		

Appendix E

Laboratory Report - Sub-slab soil vapour





A.B.N. 44 000 964 278 3 - 5, 18 Redland Drive Mitcham, Vic, 3132 Telephone: (03) 9874 1988 Fax: (03) 9874 1933

Chartered Chemists

24-Apr-2014

Parsons Brinckerhoff

Ernst & Young Centre Level 27/680 George Street Svdnev **NSW 2000 Attention: Adrian Heggie**

REPORT NUMBER: M140581

Site/Client Ref: 2201557a

CERTIFICATE OF ANALYSIS

SAMPLES:	Forty-three samples were received for analysis
DATE RECEIVED:	11-Apr-2014

11-Apr-2014

DATE RECEIVED:

DATE COMMENCED:

METHODS:

See Attached Results

RESULTS:

Please refer to attached pages for results.

Note: Results are based on samples as received at SGS Leeder Consulting's laboratories Results in airbourne concentrations are calculated using data provided by the client

Please note: Sample SS4, 1318-AN-LU-014 contained no carbon in sample container and could not be analysed.

The carbon for samples SS26, 1318-AN-LU-038 and SS27, 1318-AN-LU-039 was very damp.

REPORTED BY:

Adam Atkinson Laboratory Manager



NATA Accredited Laboratory Number: 14429

Accredited for compliance with ISO/IEC 17025.





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004519	2014004520	2014004521	2014004523
	Client ID	SS1 1318-AN-LU-011	SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	PQL				
Benzene		<2.4	<2.4	<2.4	<2.4
2-butanone(MEK)		<4.6	7.3	5.5	<4.6
n-Butylbenzene		<0.88	<0.88	<0.88	<0.88
Carbon tetrachloride		<3.7	<3.7	<3.7	9.0
Chloroethane		<5.9	<5.9	<5.9	<5.9
Chloromethane		<5.9	<5.9	<5.9	<5.9
Cyclohexane		<3.1	8.8	<3.1	<3.1
n-Decane		<130	<130	<130	<130
Dibromochloromethane		<1.8	<1.8	<1.8	<1.8
1,2-Dibromoethane		<1.8	<1.8	<1.8	<1.8
Dichlorodifluoromethane		<31	<31	<31	<31
1,1-Dichloroethane		<5.9	<5.9	<5.9	<5.9
1,2-Dichloroethane		<2.4	<2.4	<2.4	<2.4
1,1-Dichloroethene		<7.0	<7.0	<7.0	<7.0
cis-1,2-Dichloroethene		<3.0	<3.0	<3.0	<3.0
trans-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1
2,4-dimethylpentane		<3.1	<3.1	<3.1	<3.1
n-Dodecane		<440	<440	<440	<440
Ethylbenzene		<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.1	<3.1	<3.1	<3.1
n-Heptane		<3.1	<3.1	<3.1	<3.1
n-Hexane		<63	65	<63	<63
Isopropanol		<460	<460	<460	<460
Isopropylbenzene		<1.3	<1.3	<1.3	<1.3





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004519	2014004520	2014004521	2014004523
	Client ID	SS1 1318-AN-LU-011	SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	PQL				
4-Isopropyltoluene		<1.3	1.3	<1.3	<1.3
2-Methyl butane		<31	<31	<31	<31
Methyl tert-butyl ether		<3.1	<3.1	<3.1	<3.1
Methylcyclohexane		<3.1	6.3	<3.1	<3.1
2-Methylhexane		<3.1	<3.1	<3.1	<3.1
3-Methylhexane		<3.1	<3.1	<3.1	<3.1
2-Methylpentane		<310	330	<310	<310
3-Methylpentane		<3.1	4.4	<3.1	<3.1
Naphthalene		<1.6	<1.6	<1.6	<1.6
n-Nonane		<1.3	6.6	<1.3	<1.3
n-Octane		<3.1	3.1	<3.1	<3.1
n-Pentane		<63	<63	<63	<63
propylbenzene		<1.3	<1.3	<1.3	<1.3
Tetrachloroethene		7.7	<1.4	<1.4	<1.4
Toluene		3.2	2.6	1.6	<1.6
1,1,1-trichloroethane		<4.6	<4.6	<4.6	<4.6
1,1,2-trichloroethane		<1.8	<1.8	<1.8	<1.8
Trichloroethene		<1.8	1.8	<1.8	<1.8
Trichloromethane		<3.0	<3.0	<3.0	4.8
1,2,4-Trimethylbenzene		1.2	7.8	<0.88	<0.88
1,3,5-Trimethylbenzene		<0.88	3.4	<0.88	<0.88
n-Undecane		<3.5	30	<3.5	<3.5
Vinyl Chloride		<11	<11	<11	<11
o-Xylene		<1.3	1.8	<1.3	<1.3
m&p-Xylenes		<1.3	3.4	<1.3	<1.3





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004524	2014004525	2014004526	2014004527	2014004528
	Client ID	SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
Benzene		15	<2.4	<2.4	<2.4	3.8
2-butanone(MEK)		<4.6	<4.6	<4.6	<4.6	4.6
n-Butylbenzene		<0.88	1.2	<0.88	<0.88	<0.88
Carbon tetrachloride		<3.7	<3.7	<3.7	<3.7	<3.7
Chloroethane		<5.9	<5.9	<5.9	<5.9	<5.9
Chloromethane		<5.9	<5.9	<5.9	<5.9	<5.9
Cyclohexane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Decane		<130	<130	<130	<130	<130
Dibromochloromethane		<1.8	<1.8	<1.8	<1.8	<1.8
1,2-Dibromoethane		<1.8	<1.8	<1.8	<1.8	<1.8
Dichlorodifluoromethane		<31	<31	<31	<31	<31
1,1-Dichloroethane		<5.9	<5.9	<5.9	<5.9	<5.9
1,2-Dichloroethane		<2.4	<2.4	<2.4	<2.4	<2.4
1,1-Dichloroethene		<7.0	<7.0	<7.0	<7.0	<7.0
cis-1,2-Dichloroethene		<3.0	<3.0	<3.0	<3.0	<3.0
trans-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1	<3.1
2,4-dimethylpentane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Dodecane		<440	<440	<440	<440	<440
Ethylbenzene		2.0	<1.3	<1.3	<1.3	1.3
Ethylcyclohexane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Heptane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Hexane		<63	75	<63	<63	<63
Isopropanol		<460	<460	<460	<460	<460
Isopropylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004524	2014004525	2014004526	2014004527	2014004528
		SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
4-Isopropyltoluene		<1.3	<1.3	<1.3	<1.3	<1.3
2-Methyl butane		<31	<31	<31	<31	<31
Methyl tert-butyl ether		<3.1	<3.1	<3.1	<3.1	<3.1
Methylcyclohexane		<3.1	<3.1	<3.1	<3.1	<3.1
2-Methylhexane		<3.1	<3.1	<3.1	<3.1	<3.1
3-Methylhexane		<3.1	<3.1	<3.1	<3.1	<3.1
2-Methylpentane		<310	390	<310	<310	<310
3-Methylpentane		<3.1	3.8	<3.1	<3.1	<3.1
Naphthalene		<1.6	<1.6	<1.6	<1.6	<1.6
n-Nonane		<1.3	<1.3	<1.3	<1.3	<1.3
n-Octane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Pentane		<63	64	<63	<63	<63
propylbenzene		<1.3	1.8	<1.3	<1.3	<1.3
Tetrachloroethene		<1.4	<1.4	1.7	3.2	6.6
Toluene		14	3.6	1.6	1.6	9.4
1,1,1-trichloroethane		<4.6	<4.6	<4.6	<4.6	<4.6
1,1,2-trichloroethane		<1.8	<1.8	<1.8	<1.8	<1.8
Trichloroethene		<1.8	<1.8	2.2	<1.8	100
Trichloromethane		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene		1.4	5.8	<0.88	<0.88	1.9
1,3,5-Trimethylbenzene		<0.88	1.8	<0.88	<0.88	0.88
n-Undecane		<3.5	<3.5	<3.5	<3.5	<3.5
Vinyl Chloride		<11	<11	<11	<11	<11
o-Xylene		1.8	3.2	<1.3	<1.3	2.6
m&p-Xylenes		9.3	3.2	<1.3	<1.3	8.2





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004529	2014004530	2014004531	2014004532	2014004533
	Client ID	SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	SS15 1318-AN-LU-025
Analyte Name	PQL					
Benzene		<2.4	<2.4	3.4	2.9	<2.4
2-butanone(MEK)		4.6	<4.6	<4.6	<4.6	<4.6
n-Butylbenzene		0.88	<0.88	<0.88	<0.88	<0.88
Carbon tetrachloride		<3.7	4.5	<3.7	<3.7	<3.7
Chloroethane		<5.9	<5.9	<5.9	<5.9	<5.9
Chloromethane		<5.9	<5.9	<5.9	<5.9	<5.9
Cyclohexane		<3.1	<3.1	4.4	<3.1	<3.1
n-Decane		<130	<130	<130	<130	<130
Dibromochloromethane		<1.8	<1.8	<1.8	<1.8	<1.8
1,2-Dibromoethane		<1.8	<1.8	<1.8	<1.8	<1.8
Dichlorodifluoromethane		<31	<31	<31	<31	<31
1,1-Dichloroethane		<5.9	<5.9	<5.9	<5.9	<5.9
1,2-Dichloroethane		<2.4	<2.4	<2.4	<2.4	<2.4
1,1-Dichloroethene		<7.0	<7.0	<7.0	<7.0	<7.0
cis-1,2-Dichloroethene		<3.0	<3.0	<3.0	<3.0	<3.0
trans-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1	<3.1
2,4-dimethylpentane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Dodecane		<440	<440	<440	<440	<440
Ethylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Heptane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Hexane		<63	<63	<63	<63	<63
Isopropanol		<460	<460	<460	<460	<460
Isopropylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004529	2014004530	2014004531	2014004532	2014004533 SS15 1318-AN-LU-025
		SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	
Analyte Name	PQL					
4-Isopropyltoluene		<1.3	<1.3	<1.3	<1.3	<1.3
2-Methyl butane		<31	<31	<31	<31	<31
Methyl tert-butyl ether		<3.1	<3.1	<3.1	<3.1	<3.1
Methylcyclohexane		<3.1	<3.1	3.8	<3.1	<3.1
2-Methylhexane		<3.1	<3.1	<3.1	<3.1	<3.1
3-Methylhexane		<3.1	<3.1	<3.1	<3.1	<3.1
2-Methylpentane		<310	<310	<310	<310	<310
3-Methylpentane		<3.1	<3.1	<3.1	<3.1	<3.1
Naphthalene		<1.6	<1.6	<1.6	<1.6	<1.6
n-Nonane		<1.3	<1.3	<1.3	<1.3	<1.3
n-Octane		<3.1	<3.1	<3.1	<3.1	<3.1
n-Pentane		<63	<63	<63	<63	<63
propylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Tetrachloroethene		<1.4	1.4	<1.4	<1.4	<1.4
Toluene		2.9	<1.6	1.9	<1.6	<1.6
1,1,1-trichloroethane		<4.6	<4.6	<4.6	<4.6	<4.6
1,1,2-trichloroethane		<1.8	<1.8	<1.8	<1.8	<1.8
Trichloroethene		40	<1.8	<1.8	5.5	1.8
Trichloromethane		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene		<0.88	<0.88	<0.88	<0.88	<0.88
1,3,5-Trimethylbenzene		<0.88	<0.88	<0.88	<0.88	<0.88
n-Undecane		<3.5	<3.5	<3.5	<3.5	<3.5
Vinyl Chloride		<11	<11	<11	<11	<11
o-Xylene		<1.3	<1.3	<1.3	<1.3	<1.3
m&p-Xylenes		2.6	<1.3	<1.3	<1.3	<1.3





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004534	2014004535	2014004536	2014004537	2014004538
	Client ID	SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028	SS18 dup 1318-AN-LU-029	SS19 1318-AN-LU-030
Analyte Name	PQL					
Benzene		<2.4	<2.4	<2.5	<2.5	<2.5
2-butanone(MEK)		6.4	6.4	<4.7	<4.7	<4.7
n-Butylbenzene		<0.88	<0.88	<0.91	<0.91	<0.91
Carbon tetrachloride		<3.7	<3.7	<3.9	<3.9	<3.9
Chloroethane		<5.9	<5.9	<6.1	<6.1	<6.1
Chloromethane		<5.9	<5.9	<6.1	<6.1	<6.1
Cyclohexane		<3.1	<3.1	<3.2	<3.2	<3.3
n-Decane		<130	<130	<140	<140	<140
Dibromochloromethane		<1.8	<1.8	<1.9	<1.9	<1.9
1,2-Dibromoethane		<1.8	<1.8	<1.9	<1.9	<1.9
Dichlorodifluoromethane		<31	<31	<32	<32	<33
1,1-Dichloroethane		<5.9	<5.9	<6.1	<6.1	<6.1
1,2-Dichloroethane		<2.4	<2.4	<2.5	<2.5	<2.5
1,1-Dichloroethene		<7.0	<7.0	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene		<3.0	<3.0	<3.1	<3.1	<3.1
trans-1,2-Dichloroethene		<3.1	<3.1	<3.2	<3.2	<3.3
2,4-dimethylpentane		<3.1	<3.1	<3.2	<3.2	<3.3
n-Dodecane		<440	<440	<460	<460	<460
Ethylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.1	<3.1	<3.2	<3.2	<3.3
n-Heptane		<3.1	<3.1	<3.2	<3.2	<3.3
n-Hexane		<63	71	<65	<65	<65
Isopropanol		<460	<460	<470	<470	<470
Isopropylbenzene		<1.3	<1.3	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004534	2014004535	2014004536	2014004537 SS18 dup 1318-AN-LU-029	2014004538 SS19 1318-AN-LU-030
		SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028		
Analyte Name	PQL					
4-Isopropyltoluene		<1.3	<1.3	<1.4	<1.4	<1.4
2-Methyl butane		<31	<31	<32	<32	<33
Methyl tert-butyl ether		<3.1	<3.1	<3.2	<3.2	<3.3
Methylcyclohexane		<3.1	<3.1	<3.2	<3.2	<3.3
2-Methylhexane		<3.1	<3.1	<3.2	<3.2	<3.3
3-Methylhexane		<3.1	<3.1	<3.2	<3.2	<3.3
2-Methylpentane		<310	360	<320	<320	<330
3-Methylpentane		<3.1	3.8	<3.2	<3.2	<3.3
Naphthalene		<1.6	<1.6	<1.7	<1.7	<1.7
n-Nonane		<1.3	<1.3	<1.4	<1.4	<1.4
n-Octane		<3.1	<3.1	<3.2	<3.2	<3.3
n-Pentane		<63	<63	<65	<65	<65
propylbenzene		<1.3	<1.3	<1.4	<1.4	<1.4
Tetrachloroethene		1.4	7.4	8.0	10	8.9
Toluene		2.6	1.6	<1.7	<1.7	<1.7
1,1,1-trichloroethane		<4.6	<4.6	<4.7	<4.7	<4.7
1,1,2-trichloroethane		<1.8	<1.8	<1.9	<1.9	<1.9
Trichloroethene		2.2	150	640	790	2800
Trichloromethane		<3.0	<3.0	<3.1	<3.1	<3.1
1,2,4-Trimethylbenzene		3.5	<0.88	<0.91	<0.91	<0.91
1,3,5-Trimethylbenzene		1.2	<0.88	<0.91	<0.91	<0.91
n-Undecane		<3.5	<3.5	<3.6	<3.6	<3.6
Vinyl Chloride		<11	<11	<12	<12	<12
o-Xylene		1.9	<1.3	<1.4	<1.4	<1.4
m&p-Xylenes		1.9	<1.3	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004539	2014004540	2014004541	2014004542	2014004543
		SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033	SS22 1318-AN-LU-034	SS23 1318-AN-LU-035
Analyte Name	PQL					
Benzene		<2.5	<2.5	<2.5	<2.5	<2.5
2-butanone(MEK)		<4.7	<4.7	<4.7	7.6	<4.7
n-Butylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
Carbon tetrachloride		<3.9	<3.9	<3.9	<3.9	<3.9
Chloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
Chloromethane		<6.1	<6.1	<6.1	<6.1	<6.1
Cyclohexane		<3.2	<3.2	<3.2	<3.3	<3.3
n-Decane		<140	<140	<140	<140	<140
Dibromochloromethane		<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dibromoethane		<1.9	<1.9	<1.9	<1.9	<1.9
Dichlorodifluoromethane		<32	<32	<32	<33	<33
1,1-Dichloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
1,2-Dichloroethane		<2.5	<2.5	<2.5	<2.5	<2.5
1,1-Dichloroethene		<7.2	<7.2	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1	<3.1
trans-1,2-Dichloroethene		<3.2	<3.2	<3.2	<3.3	<3.3
2,4-dimethylpentane		<3.2	<3.2	<3.2	<3.3	<3.3
n-Dodecane		<460	<460	<460	<460	<460
Ethylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.2	<3.2	<3.2	<3.3	<3.3
n-Heptane		<3.2	<3.2	<3.2	<3.3	<3.3
n-Hexane		<65	73	<65	100	<65
Isopropanol		<470	<470	<470	<470	<470
Isopropylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004539	2014004540	2014004541	2014004542 SS22 1318-AN-LU-034	2014004543 SS23 1318-AN-LU-035
		SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033		
Analyte Name	PQL					
4-Isopropyltoluene		<1.4	<1.4	<1.4	<1.4	<1.4
2-Methyl butane		<32	<32	<32	<33	<33
Methyl tert-butyl ether		<3.2	<3.2	<3.2	<3.3	<3.3
Methylcyclohexane		<3.2	<3.2	<3.2	<3.3	<3.3
2-Methylhexane		<3.2	<3.2	<3.2	<3.3	<3.3
3-Methylhexane		<3.2	<3.2	<3.2	<3.3	<3.3
2-Methylpentane		<320	380	<320	510	<330
3-Methylpentane		<3.2	3.9	<3.2	5.2	3.2
Naphthalene		<1.7	<1.7	<1.7	<1.7	<1.7
n-Nonane		<1.4	<1.4	<1.4	<1.4	<1.4
n-Octane		<3.2	<3.2	<3.2	<3.3	<3.3
n-Pentane		<65	<65	<65	80	<65
propylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethene		3.0	3.2	3.6	2.1	<1.5
Toluene		<1.7	<1.7	<1.7	<1.7	<1.7
1,1,1-trichloroethane		<4.7	<4.7	<4.7	<4.7	<4.7
1,1,2-trichloroethane		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloroethene		1000	1000	520	170	<1.9
Trichloromethane		<3.1	<3.1	<3.1	<3.1	<3.1
1,2,4-Trimethylbenzene		<0.91	<0.91	<0.91	1.1	0.91
1,3,5-Trimethylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
n-Undecane		<3.6	<3.6	<3.6	<3.6	<3.6
Vinyl Chloride		<12	<12	<12	<12	<12
o-Xylene		<1.4	<1.4	<1.4	<1.4	<1.4
m&p-Xylenes		<1.4	<1.4	<1.4	1.6	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004544	2014004545	2014004546	2014004547	2014004548
		SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
Benzene		<2.5	48	<2.5	<2.5	<2.5
2-butanone(MEK)		<4.7	<4.7	<4.7	<4.7	<4.7
n-Butylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
Carbon tetrachloride		<3.9	<3.9	<3.9	<3.9	<3.9
Chloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
Chloromethane		<6.1	<6.1	<6.1	<6.1	<6.1
Cyclohexane		<3.3	5.2	<3.3	<3.3	<3.3
n-Decane		<140	<140	<140	<140	<140
Dibromochloromethane		<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dibromoethane		<1.9	<1.9	<1.9	<1.9	<1.9
Dichlorodifluoromethane		<33	<33	<33	<33	<33
1,1-Dichloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
1,2-Dichloroethane		<2.5	<2.5	<2.5	<2.5	<2.5
1,1-Dichloroethene		<7.2	<7.2	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1	<3.1
trans-1,2-Dichloroethene		<3.3	<3.3	<3.3	<3.3	<3.3
2,4-dimethylpentane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Dodecane		<460	<460	<460	<460	<460
Ethylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Heptane		<3.3	3.2	<3.3	<3.3	<3.3
n-Hexane		88	<65	<65	<65	<65
Isopropanol		<470	<470	<470	<470	<470
Isopropylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID Client ID	2014004544	2014004545	2014004546	2014004547	2014004548
		SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
4-Isopropyltoluene		<1.4	<1.4	<1.4	<1.4	<1.4
2-Methyl butane		<33	<33	<33	<33	<33
Methyl tert-butyl ether		<3.3	<3.3	<3.3	<3.3	<3.3
Methylcyclohexane		<3.3	14	<3.3	<3.3	<3.3
2-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
3-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
2-Methylpentane		440	<330	<330	<330	<330
3-Methylpentane		4.6	<3.3	<3.3	<3.3	<3.3
Naphthalene		<1.7	<1.7	<1.7	<1.7	<1.7
n-Nonane		<1.4	<1.4	<1.4	<1.4	<1.4
n-Octane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Pentane		67	<65	<65	<65	<65
propylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethene		<1.5	<1.5	<1.5	<1.5	<1.5
Toluene		3.0	2.0	<1.7	<1.7	1.7
1,1,1-trichloroethane		<4.7	<4.7	<4.7	<4.7	<4.7
1,1,2-trichloroethane		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloroethene		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloromethane		<3.1	<3.1	<3.1	<3.1	<3.1
1,2,4-Trimethylbenzene		1.3	<0.91	<0.91	<0.91	<0.91
1,3,5-Trimethylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
n-Undecane		<3.6	<3.6	<3.6	<3.6	<3.6
Vinyl Chloride		<12	<12	<12	<12	<12
o-Xylene		<1.4	<1.4	<1.4	<1.4	<1.4
m&p-Xylenes		2.5	1.6	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
Benzene		<2.5	<2.5	5.4	<2.5	<2.5
2-butanone(MEK)		4.7	<4.7	<4.7	<4.7	5.7
n-Butylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
Carbon tetrachloride		<3.9	<3.9	<3.9	<3.9	<3.9
Chloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
Chloromethane		<6.1	<6.1	<6.1	<6.1	<6.1
Cyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Decane		<140	<140	<140	<140	<140
Dibromochloromethane		<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dibromoethane		<1.9	<1.9	<1.9	<1.9	<1.9
Dichlorodifluoromethane		<33	<33	<33	<33	<33
1,1-Dichloroethane		<6.1	<6.1	<6.1	<6.1	<6.1
1,2-Dichloroethane		<2.5	<2.5	<2.5	<2.5	<2.5
1,1-Dichloroethene		<7.2	<7.2	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene		<3.1	<3.1	<3.1	<3.1	<3.1
trans-1,2-Dichloroethene		<3.3	<3.3	<3.3	<3.3	<3.3
2,4-dimethylpentane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Dodecane		<460	<460	<460	<460	<460
Ethylbenzene		<1.3	<1.3	<1.3	<1.3	<1.3
Ethylcyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Heptane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Hexane		<65	<65	<65	<65	<65
Isopropanol		<470	<470	<470	<470	<470
Isopropylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
4-Isopropyltoluene		<1.4	<1.4	<1.4	<1.4	<1.4
2-Methyl butane		<33	<33	<33	<33	<33
Methyl tert-butyl ether		<3.3	<3.3	<3.3	<3.3	<3.3
Methylcyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
2-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
3-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
2-Methylpentane		<330	<330	<330	<330	<330
3-Methylpentane		<3.3	<3.3	<3.3	<3.3	3.2
Naphthalene		<1.7	<1.7	<1.7	<1.7	<1.7
n-Nonane		<1.4	<1.4	<1.4	<1.4	<1.4
n-Octane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Pentane		<65	<65	<65	<65	<65
propylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethene		<1.5	<1.5	<1.5	67	72
Toluene		2.7	2.3	4.4	<1.7	1.7
1,1,1-trichloroethane		<4.7	<4.7	<4.7	<4.7	<4.7
1,1,2-trichloroethane		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloroethene		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloromethane		<3.1	<3.1	<3.1	<3.1	<3.1
1,2,4-Trimethylbenzene		<0.91	<0.91	0.91	<0.91	<0.91
1,3,5-Trimethylbenzene		<0.91	<0.91	<0.91	<0.91	<0.91
n-Undecane		<3.6	<3.6	<3.6	<3.6	<3.6
Vinyl Chloride		<12	<12	<12	<12	<12
o-Xylene		<1.4	<1.4	<1.4	<1.4	<1.4
m&p-Xylenes		<1.4	<1.4	1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004554	2014004555	2014004556	2014004557	2014004558
	Client ID	SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
Benzene		<2.5	<2.5	<2.5	6.5	3.0
2-butanone(MEK)		<4.7	<4.7	<4.8	<4.8	10
n-Butylbenzene		<0.91	<0.91	<0.91	<0.92	<0.92
Carbon tetrachloride		<3.9	<3.9	<3.9	<3.9	<3.9
Chloroethane		<6.1	<6.1	<6.2	<6.2	<6.2
Chloromethane		<6.1	<6.1	<6.2	<6.2	<6.2
Cyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Decane		<140	<140	<140	<140	<140
Dibromochloromethane		<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dibromoethane		<1.9	<1.9	<1.9	<1.9	<1.9
Dichlorodifluoromethane		<33	<33	<33	<33	<33
1,1-Dichloroethane		<6.1	<6.1	<6.2	<6.2	<6.2
1,2-Dichloroethane		<2.5	<2.5	<2.5	<2.5	<2.5
1,1-Dichloroethene		<7.2	<7.2	<7.2	<7.2	<7.2
cis-1,2-Dichloroethene		<3.1	<3.1	<3.1	220	130
trans-1,2-Dichloroethene		<3.3	<3.3	<3.3	19	7.8
2,4-dimethylpentane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Dodecane		<460	<460	<460	<460	<460
Ethylbenzene		<1.3	<1.3	<1.3	3.2	3.5
Ethylcyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Heptane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Hexane		<65	<65	<65	<65	<65
Isopropanol		<470	<470	<480	<480	<480
Isopropylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004554	2014004555	2014004556	2014004557	2014004558
	Client ID	SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
4-Isopropyltoluene		<1.4	<1.4	<1.4	1.6	<1.4
2-Methyl butane		<33	<33	<33	<33	<33
Methyl tert-butyl ether		<3.3	<3.3	<3.3	<3.3	<3.3
Methylcyclohexane		<3.3	<3.3	<3.3	<3.3	<3.3
2-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
3-Methylhexane		<3.3	<3.3	<3.3	<3.3	<3.3
2-Methylpentane		<330	<330	<330	<330	<330
3-Methylpentane		<3.3	<3.3	<3.3	<3.3	<3.3
Naphthalene		<1.7	<1.7	<1.7	<1.7	<1.7
n-Nonane		<1.4	<1.4	<1.4	<1.4	<1.4
n-Octane		<3.3	<3.3	<3.3	<3.3	<3.3
n-Pentane		<65	<65	<65	<65	<65
propylbenzene		<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethene		51	7.1	13	19	6.2
Toluene		2.0	3.0	1.7	6.7	5.7
1,1,1-trichloroethane		<4.7	<4.7	<4.8	6.7	<4.8
1,1,2-trichloroethane		<1.9	<1.9	<1.9	<1.9	<1.9
Trichloroethene		<1.9	<1.9	<1.9	4200	980
Trichloromethane		<3.1	<3.1	<3.1	64	17
1,2,4-Trimethylbenzene		<0.91	<0.91	<0.91	1.5	0.92
1,3,5-Trimethylbenzene		<0.91	<0.91	<0.91	<0.92	<0.92
n-Undecane		<3.6	<3.6	<3.7	<3.7	<3.7
Vinyl Chloride		<12	<12	<12	<12	<12
o-Xylene		<1.4	<1.4	<1.4	1.9	<1.4
m&p-Xylenes		<1.4	1.9	<1.4	3.6	1.9





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004559
	Client ID	SS37 dup 1318-AN-LU-052
Analyte Name	PQL	
Benzene		3.5
2-butanone(MEK)		9.5
n-Butylbenzene		<0.92
Carbon tetrachloride		<3.9
Chloroethane		<6.2
Chloromethane		<6.2
Cyclohexane		<3.3
n-Decane		<140
Dibromochloromethane		<1.9
1,2-Dibromoethane		<1.9
Dichlorodifluoromethane		<33
1,1-Dichloroethane		<6.2
1,2-Dichloroethane		<2.5
1,1-Dichloroethene		<7.2
cis-1,2-Dichloroethene		110
trans-1,2-Dichloroethene		7.2
2,4-dimethylpentane		<3.3
n-Dodecane		<460
Ethylbenzene		6.4
Ethylcyclohexane		<3.3
n-Heptane		<3.3
n-Hexane		<65
Isopropanol		<480
Isopropylbenzene		<1.4





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.06 Volatile Organics (w/v)

	Leeder ID	2014004559
	Client ID	SS37 dup 1318-AN-LU-052
Analyte Name	PQL	
4-Isopropyltoluene		<1.4
2-Methyl butane		<33
Methyl tert-butyl ether		<3.3
Methylcyclohexane		<3.3
2-Methylhexane		<3.3
3-Methylhexane		<3.3
2-Methylpentane		<330
3-Methylpentane		<3.3
Naphthalene		<1.7
n-Nonane		<1.4
n-Octane		<3.3
n-Pentane		<65
propylbenzene		<1.4
Tetrachloroethene		4.5
Toluene		7.4
1,1,1-trichloroethane		<4.8
1,1,2-trichloroethane		<1.9
Trichloroethene		760
Trichloromethane		14
1,2,4-Trimethylbenzene		<0.92
1,3,5-Trimethylbenzene		<0.92
n-Undecane		<3.7
Vinyl Chloride		<12
o-Xylene		<1.4
m&p-Xylenes		2.5





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID		2014004520	2014004521	2014004523
	Client ID	SS1 1318-AN-LU-011	SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	PQL				
Benzene	0.05	nd	nd	nd	nd
2-butanone(MEK)	0.05	nd	0.08	0.06	nd
n-Butylbenzene	0.05	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	0.12
Chloroethane	0.05	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd
Cyclohexane	0.05	nd	0.14	nd	nd
n-Decane	5	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd
n-Hexane	1	nd	1	nd	nd
Isopropanol	0.05	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID		2014004520	2014004521	2014004523
	Client ID	SS1 1318-AN-LU-011	SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	PQL				
4-Isopropyltoluene	0.05	nd	0.05	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	0.10	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd
2-Methylpentane	5	nd	5	nd	nd
3-Methylpentane	0.05	nd	0.07	nd	nd
Naphthalene	0.05	nd	nd	nd	nd
n-Nonane	0.05	nd	0.25	nd	nd
n-Octane	0.05	nd	0.05	nd	nd
n-Pentane	1	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd
Tetrachloroethene	0.05	0.27	nd	nd	nd
Toluene	0.05	0.10	0.08	0.05	nd
1,1,1-trichloroethane	0.05	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd
Trichloroethene	0.05	nd	0.05	nd	nd
Trichloromethane	0.05	nd	nd	nd	0.08
1,2,4-Trimethylbenzene	0.05	0.07	0.44	nd	nd
1,3,5-Trimethylbenzene	0.05	nd	0.19	nd	nd
n-Undecane	0.2	nd	1.7	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd
o-Xylene	0.05	nd	0.07	nd	nd
m&p-Xylenes	0.05	nd	0.13	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004524	2014004525	2014004526	2014004527	2014004528
	Client ID	SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
Benzene	0.05	0.31	nd	nd	nd	0.08
2-butanone(MEK)	0.05	nd	nd	nd	nd	0.05
n-Butylbenzene	0.05	nd	0.07	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	0.08	nd	nd	nd	0.05
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	1	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004524	2014004525	2014004526	2014004527	2014004528
	Client ID	SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	6	nd	nd	nd
3-Methylpentane	0.05	nd	0.06	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	1	nd	nd	nd
propylbenzene	0.05	nd	0.07	nd	nd	nd
Tetrachloroethene	0.05	nd	nd	0.06	0.11	0.23
Toluene	0.05	0.43	0.11	0.05	0.05	0.29
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	nd	nd	0.06	nd	2.8
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	0.08	0.33	nd	nd	0.11
1,3,5-Trimethylbenzene	0.05	nd	0.10	nd	nd	0.05
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	0.07	0.12	nd	nd	0.10
m&p-Xylenes	0.05	0.35	0.12	nd	nd	0.31





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004529	2014004530	2014004531	2014004532	2014004533
	Client ID	SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	SS15 1318-AN-LU-025
Analyte Name	PQL					
Benzene	0.05	nd	nd	0.07	0.06	nd
2-butanone(MEK)	0.05	0.05	nd	nd	nd	nd
n-Butylbenzene	0.05	0.05	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	0.06	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	0.07	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	nd	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004529	2014004530	2014004531	2014004532	2014004533
	Client ID	SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	SS15 1318-AN-LU-025
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	0.06	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	nd	nd	nd	nd
3-Methylpentane	0.05	nd	nd	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	nd	0.05	nd	nd	nd
Toluene	0.05	0.09	nd	0.06	nd	nd
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	1.1	nd	nd	0.15	0.05
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	nd	nd
m&p-Xylenes	0.05	0.10	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004534	2014004535	2014004536	2014004537	2014004538
	Client ID	SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028	SS18 dup 1318-AN-LU-029	SS19 1318-AN-LU-030
Analyte Name	PQL					
Benzene	0.05	nd	nd	nd	nd	nd
2-butanone(MEK)	0.05	0.07	0.07	nd	nd	nd
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	1	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004534	2014004535	2014004536	2014004537	2014004538
	Client ID	SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028	SS18 dup 1318-AN-LU-029	SS19 1318-AN-LU-030
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	6	nd	nd	nd
3-Methylpentane	0.05	nd	0.06	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	0.05	0.26	0.27	0.34	0.30
Toluene	0.05	0.08	0.05	nd	nd	nd
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	0.06	4.1	17	21	73
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	0.20	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.05	0.07	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	0.07	nd	nd	nd	nd
m&p-Xylenes	0.05	0.07	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004539	2014004540	2014004541	2014004542	2014004543
	Client ID	SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033	SS22 1318-AN-LU-034	SS23 1318-AN-LU-035
Analyte Name	PQL					
Benzene	0.05	nd	nd	nd	nd	nd
2-butanone(MEK)	0.05	nd	nd	nd	0.08	nd
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	1	nd	2	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004539	2014004540	2014004541	2014004542	2014004543
	Client ID	SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033	SS22 1318-AN-LU-034	SS23 1318-AN-LU-035
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	6	nd	8	nd
3-Methylpentane	0.05	nd	0.06	nd	0.08	0.05
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	1	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	0.10	0.11	0.12	0.07	nd
Toluene	0.05	nd	nd	nd	nd	nd
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	27	27	14	4.4	nd
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	nd	nd	nd	0.06	0.05
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	nd	nd
m&p-Xylenes	0.05	nd	nd	nd	0.06	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004544	2014004545	2014004546	2014004547	2014004548
	Client ID	SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
Benzene	0.05	nd	0.96	nd	nd	nd
2-butanone(MEK)	0.05	nd	nd	nd	nd	nd
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	0.08	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	0.05	nd	nd	nd
n-Hexane	1	1	nd	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004544	2014004545	2014004546	2014004547	2014004548
	Client ID	SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	0.21	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	7	nd	nd	nd	nd
3-Methylpentane	0.05	0.07	nd	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	1	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	nd	nd	nd	nd	nd
Toluene	0.05	0.09	0.06	nd	nd	0.05
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	nd	nd	nd	nd	nd
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	0.07	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	nd	nd
m&p-Xylenes	0.05	0.09	0.06	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
Benzene	0.05	nd	nd	0.11	nd	nd
2-butanone(MEK)	0.05	0.05	nd	nd	nd	0.06
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	nd	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	nd	nd	nd	nd
3-Methylpentane	0.05	nd	nd	nd	nd	0.05
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	nd	nd	nd	2.3	2.4
Toluene	0.05	0.08	0.07	0.13	nd	0.05
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	nd	nd	nd	nd	nd
Trichloromethane	0.05	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	nd	nd	0.05	nd	nd
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	nd	nd
m&p-Xylenes	0.05	nd	nd	0.05	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004554	2014004555	2014004556	2014004557	2014004558
	Client ID	SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
Benzene	0.05	nd	nd	nd	0.13	0.06
2-butanone(MEK)	0.05	nd	nd	nd	nd	0.11
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd	nd	nd	3.5	2.1
trans-1,2-Dichloroethene	0.05	nd	nd	nd	0.29	0.12
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	nd	nd	nd	0.12	0.13
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	nd	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID Client ID	2014004554	2014004555	2014004556	2014004557	2014004558
		SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
4-Isopropyltoluene	0.05	nd	nd	nd	0.06	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	nd	nd	nd	nd
3-Methylpentane	0.05	nd	nd	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	1.7	0.24	0.44	0.64	0.21
Toluene	0.05	0.06	0.09	0.05	0.20	0.17
1,1,1-trichloroethane	0.05	nd	nd	nd	0.07	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	nd	nd	nd	110	26
Trichloromethane	0.05	nd	nd	nd	1.0	0.27
1,2,4-Trimethylbenzene	0.05	nd	nd	nd	0.08	0.05
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	0.07	nd
m&p-Xylenes	0.05	nd	0.07	nd	0.13	0.07





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004559	2014004560	2014004561	2014004562	2014004563
	Client ID	SS37 dup 1318-AN-LU-052	TRIP BLANK 1 1318-AN-LU-053	TRIP BLANK 2 1318-AN-LU-054	Method	Method
Analyte Name	PQL				Blank	Blank
Benzene	0.05	0.07	nd	nd	nd	nd
2-butanone(MEK)	0.05	0.10	nd	nd	nd	nd
n-Butylbenzene	0.05	nd	nd	nd	nd	nd
Carbon tetrachloride	0.05	nd	nd	nd	nd	nd
Chloroethane	0.05	nd	nd	nd	nd	nd
Chloromethane	0.05	nd	nd	nd	nd	nd
Cyclohexane	0.05	nd	nd	nd	nd	nd
n-Decane	5	nd	nd	nd	nd	nd
Dibromochloromethane	0.05	nd	nd	nd	nd	nd
1,2-Dibromoethane	0.05	nd	nd	nd	nd	nd
Dichlorodifluoromethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,2-Dichloroethane	0.05	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	1.7	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	0.11	nd	nd	nd	nd
2,4-dimethylpentane	0.05	nd	nd	nd	nd	nd
n-Dodecane	25	nd	nd	nd	nd	nd
Ethylbenzene	0.05	0.24	nd	nd	nd	nd
Ethylcyclohexane	0.05	nd	nd	nd	nd	nd
n-Heptane	0.05	nd	nd	nd	nd	nd
n-Hexane	1	nd	nd	nd	nd	nd
Isopropanol	0.05	nd	nd	nd	nd	nd
Isopropylbenzene	0.05	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004559	2014004560	2014004561	2014004562	2014004563
	Client ID	SS37 dup 1318-AN-LU-052	TRIP BLANK 1 1318-AN-LU-053	TRIP BLANK 2 1318-AN-LU-054	Method	Method
Analyte Name	PQL				Blank	Blank
4-Isopropyltoluene	0.05	nd	nd	nd	nd	nd
2-Methyl butane	0.5	nd	nd	nd	nd	nd
Methyl tert-butyl ether	0.05	nd	nd	nd	nd	nd
Methylcyclohexane	0.05	nd	nd	nd	nd	nd
2-Methylhexane	0.05	nd	nd	nd	nd	nd
3-Methylhexane	0.05	nd	nd	nd	nd	nd
2-Methylpentane	5	nd	nd	nd	nd	nd
3-Methylpentane	0.05	nd	nd	nd	nd	nd
Naphthalene	0.05	nd	nd	nd	nd	nd
n-Nonane	0.05	nd	nd	nd	nd	nd
n-Octane	0.05	nd	nd	nd	nd	nd
n-Pentane	1	nd	nd	nd	nd	nd
propylbenzene	0.05	nd	nd	nd	nd	nd
Tetrachloroethene	0.05	0.15	nd	nd	nd	nd
Toluene	0.05	0.22	nd	nd	nd	nd
1,1,1-trichloroethane	0.05	nd	nd	nd	nd	nd
1,1,2-trichloroethane	0.05	nd	nd	nd	nd	nd
Trichloroethene	0.05	20	nd	nd	nd	nd
Trichloromethane	0.05	0.22	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.05	nd	nd	nd	nd	nd
n-Undecane	0.2	nd	nd	nd	nd	nd
Vinyl Chloride	0.05	nd	nd	nd	nd	nd
o-Xylene	0.05	nd	nd	nd	nd	nd
m&p-Xylenes	0.05	0.09	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

	Leeder ID	2014004564
	Client ID	Method
Analyte Name	PQL	Blank
Benzene	0.05	nd
2-butanone(MEK)	0.05	nd
n-Butylbenzene	0.05	nd
Carbon tetrachloride	0.05	nd
Chloroethane	0.05	nd
Chloromethane	0.05	nd
Cyclohexane	0.05	nd
n-Decane	5	nd
Dibromochloromethane	0.05	nd
1,2-Dibromoethane	0.05	nd
Dichlorodifluoromethane	0.05	nd
1,1-Dichloroethane	0.05	nd
1,2-Dichloroethane	0.05	nd
1,1-Dichloroethene	0.05	nd
cis-1,2-Dichloroethene	0.05	nd
trans-1,2-Dichloroethene	0.05	nd
2,4-dimethylpentane	0.05	nd
n-Dodecane	25	nd
Ethylbenzene	0.05	nd
Ethylcyclohexane	0.05	nd
n-Heptane	0.05	nd
n-Hexane	1	nd
Isopropanol	0.05	nd
Isopropylbenzene	0.05	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

1	Leeder ID	2014004564
	Client ID	Method
Analyte Name	PQL	Blank
4-Isopropyltoluene	0.05	nd
2-Methyl butane	0.5	nd
Methyl tert-butyl ether	0.05	nd
Methylcyclohexane	0.05	nd
2-Methylhexane	0.05	nd
3-Methylhexane	0.05	nd
2-Methylpentane	5	nd
3-Methylpentane	0.05	nd
Naphthalene	0.05	nd
n-Nonane	0.05	nd
n-Octane	0.05	nd
n-Pentane	1	nd
propylbenzene	0.05	nd
Tetrachloroethene	0.05	nd
Toluene	0.05	nd
1,1,1-trichloroethane	0.05	nd
1,1,2-trichloroethane	0.05	nd
Trichloroethene	0.05	nd
Trichloromethane	0.05	nd
1,2,4-Trimethylbenzene	0.05	nd
1,3,5-Trimethylbenzene	0.05	nd
n-Undecane	0.2	nd
Vinyl Chloride	0.05	nd
o-Xylene	0.05	nd
m&p-Xylenes	0.05	nd





Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

Sample units are expressed in $\mu g/m^3$

1	Leeder ID	2014004519	2014004520	2014004521	2014004523
	Client ID	SS1 1318-AN-LU-011	SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	analyte Name PQL				
C6-C10		<480	850	630	<480
>C10-C16		<400	1200	510	<400

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

	Leeder ID	2014004524	2014004525	2014004526	2014004527	2014004528
	Client ID	SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
C6-C10		780	900	<480	<480	<480
>C10-C16		450	750	<400	<400	<400





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

Sample units are expressed in $\mu g/m^3$

	Leeder ID	2014004529	2014004530	2014004531	2014004532	2014004533
	Client ID	SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	SS15 1318-AN-LU-025
Analyte Name	PQL					
C6-C10		490	<480	<480	<480	<480
>C10-C16		440	<400	470	<400	<400

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

	Leeder ID	2014004534	2014004535	2014004536	2014004537	2014004538
	Client ID	SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028	SS18 dup 1318-AN-LU-029	SS19 1318-AN-LU-030
Analyte Name	PQL					
C6-C10		530	940	650	1100	2700
>C10-C16		400	790	<410	560	<410





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

Sample units are expressed in $\mu g/m^3$

	Leeder ID	2014004539	2014004540	2014004541	2014004542	2014004543
	Client ID	SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033	SS22 1318-AN-LU-034	SS23 1318-AN-LU-035
Analyte Name	PQL					
C6-C10		1400	1800	590	1200	660
>C10-C16		<400	700	<400	990	540

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

	Leeder ID	2014004544	2014004545	2014004546	2014004547	2014004548
	Client ID	SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
C6-C10		1000	<480	<480	<480	<480
>C10-C16		840	<400	<400	<400	<400





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

Sample units are expressed in $\mu g/m^3$

	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
C6-C10		<480	<480	<480	<480	600
>C10-C16		440	400	420	<400	510

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

	Leeder ID	2014004554	2014004555	2014004556	2014004557	2014004558
	Client ID	SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
C6-C10		<480	<480	<500	4300	1400
>C10-C16		<400	410	<410	<410	610





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.04 Total Petroleum Hydrocarbons

Sample units are expressed in $\mu g/m^3$

	Leeder ID Client ID	2014004559 SS37 dup 1318-AN-LU-052
Analyte Name	PQL	
C6-C10		900
>C10-C16		<410

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

1	Leeder ID	2014004519	2014004520	2014004521	2014004523
	Client ID		SS2 1318-AN-LU-012	SS3 1318-AN-LU-013	SS5 1318-AN-LU-015
Analyte Name	PQL				
C6-C10	15	nd	27	20	nd
>C10-C16	15	nd	43	19	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

Sample units are expressed in μg total

I	Leeder ID	2014004524	2014004525	2014004526	2014004527	2014004528
	Client ID	SS6 1318-AN-LU-016	SS7 1318-AN-LU-017	SS8 1318-AN-LU-018	SS9 1318-AN-LU-019	SS10 1318-AN-LU-020
Analyte Name	PQL					
C6-C10	15	24	28	nd	nd	nd
>C10-C16	15	17	28	nd	nd	nd

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

	Leeder ID	2014004529	2014004530	2014004531	2014004532	2014004533
	Client ID	SS11 1318-AN-LU-021	SS12 1318-AN-LU-022	SS13 1318-AN-LU-023	SS14 1318-AN-LU-024	SS15 1318-AN-LU-025
Analyte Name	PQL					
C6-C10	15	15	nd	nd	nd	nd
>C10-C16	15	16	nd	18	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

Sample units are expressed in μg total

J	Leeder ID	2014004534	2014004535	2014004536	2014004537	2014004538
	Client ID	SS16 1318-AN-LU-026	SS17 1318-AN-LU-027	SS18 1318-AN-LU-028	SS18 dup 1318-AN-LU-029	SS19 1318-AN-LU-030
Analyte Name	PQL					
C6-C10	15	17	29	20	34	81
>C10-C16	15	15	30	nd	20	nd

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

1	Leeder ID	2014004539	2014004540	2014004541	2014004542	2014004543
	Client ID	SS20 1318-AN-LU-031	SS20 dup 1318-AN-LU-032	SS21 1318-AN-LU-033	SS22 1318-AN-LU-034	SS23 1318-AN-LU-035
Analyte Name	PQL					
C6-C10	15	45	56	18	36	21
>C10-C16	15	nd	27	nd	37	20





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

Sample units are expressed in μg total

]	Leeder ID	2014004544	2014004545	2014004546	2014004547	2014004548
	Client ID	SS24 1318-AN-LU-036	SS25 1318-AN-LU-037	SS26 1318-AN-LU-038	SS27 1318-AN-LU-039	SS27 dup 1318-AN-LU-040
Analyte Name	PQL					
C6-C10	15	32	nd	nd	nd	nd
>C10-C16	15	32	nd	nd	nd	nd

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

J	Leeder ID	2014004549	2014004550	2014004551	2014004552	2014004553
	Client ID	SS28 1318-AN-LU-041	SS29 1318-AN-LU-042	SS30 1318-AN-LU-044	SS31 1318-AN-LU-045	SS32 1318-AN-LU-046
Analyte Name	PQL					
C6-C10	15	nd	nd	nd	nd	19
>C10-C16	15	17	15	16	nd	19





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

Sample units are expressed in μg total

I	Leeder ID	2014004554	2014004555	2014004556	2014004557	2014004558
	Client ID	SS33 1318-AN-LU-047	SS34 1318-AN-LU-048	SS35 1318-AN-LU-049	SS36 1318-AN-LU-050	SS37 1318-AN-LU-051
Analyte Name	PQL					
C6-C10	15	nd	nd	nd	130	42
>C10-C16	15	nd	15	nd	nd	22

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

J	Leeder ID	2014004559	2014004560	2014004561	2014004562	2014004563
	Client ID	SS37 dup 1318-AN-LU-052	TRIP BLANK 1 1318-AN-LU-053	TRIP BLANK 2 1318-AN-LU-054	Method	Method
Analyte Name	PQL				Blank	Blank
C6-C10	15	27	nd	nd	nd	nd
>C10-C16	15	nd	nd	nd	nd	nd





Report N°: M140581

Matrix: Passive Sampler

Method: MA-30.AIR.03 Total Petroleum Hydrocarbons

:	Leeder ID Client ID	2014004564 Method
Analyte Name	PQL	Blank
C6-C10	15	nd
>C10-C16	15	nd





(II) QUALITY CONTROL

Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2014004565	2014004566	2014004567	2014005273	2014005274
	Client ID	Method	Method	Method	Method	Method
Analyte Name	PQL	Spike	Spike Dup	Spike	Spike Dup	Spike
Benzene		95	95	97	92	97
2,4-dimethylpentane		101	107	107	107	105
Ethylbenzene		103	104	101	97	102
Isopropanol		99	101	101	103	100

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID	2014004565	2014004566	2014004567	2014005273	2014005274
	Client ID	Method	Method	Method	Method	Method
Analyte Name	PQL					
	TQL	Spike	Spike Dup	Spike	Spike Dup	Spike
2-Methyl butane		92	95	95	94	95
2-Methylhexane		119	125	122	123	121
3-Methylhexane		112	119	115	117	115
n-Pentane		100	106	105	105	104
Toluene		93	95	94	91	92
o-Xylene		99	99	99	94	99
m&p-Xylenes		112	114	111	106	110





(II) QUALITY CONTROL

Report N°: M140581

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID Client ID	2014005275 Method
Analyte Name	PQL	Spike Dup
Benzene		95
2,4-dimethylpentane		107
Ethylbenzene		103
Isopropanol		94

Matrix: Passive Sampler

Method: MA-5.WL.05 Volatile Organics

Quality Control Results are expressed in Percent Recovery of expected result

	Leeder ID Client ID	2014005275 Method
Analyte Name	PQL	Spike Dup
2-Methyl butane		96
2-Methylhexane		122
3-Methylhexane		116
n-Pentane		106
Toluene		93
o-Xylene		100
m&p-Xylenes		111

Report N°: M140581



QUALIFIERS / NOTES FOR REPORTED RESULTS

- PQL Practical Quantitation Limit
- is Insufficient Sample to perform this analysis.
- T Tentative identification based on computer library search of mass spectra.
- ND Not Detected The analyte was not detected above the reported PQL.
- NC Not calculated, Results below PQL
- nr Not Requested for analysis.
- R Rejected Result results for this analysis failed QC checks.
- SQ Semi-Quantitative result quantitation based on a generic response factor for this class of analyte.
- IM Inappropriate method of analysis for this compound
- U Unable to provide Quality Control data high levels of compounds in sample interfered with analysis of QC results.
- UF Unable to provide Quality Control data- Surrogates failed Q Cchecks due to sample matrix effects
- L Analyte detected at a level above the linear response of calibration curve.
- E Estimated result. NATA accreditation does not cover estimated results.
- C1 These compounds co-elute.
- C2 These compounds co-elute.
- CT Elevated concentration. Results reported from carbon tube analysis
- ** Sample shows non-petroleum hydrocarbon profile

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APPENDIX ONE.

CHAIN OF CUSTODY DOCUMENT

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Collected by:	ager: Adrian Heggie : (Print and Sign) Adrian Heggie Parsons Brinckerhoff Ema	ail aheggie@pb.con	n au	Project Info			Turn Around Time			Workplace Monitoring	
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	NSW Post Code 2000			Suburb & State: K			Normal: YES			Ř	
Phone: (02) 9272 5693 Fax:	<u></u>		Project Number:	2201557a		Rapid:	Ŀ.	Air	e	L
				Project Name: Ke	swick SA		Specify:(days)	- Z	oor	cpla	
Lab ID	Field Sample I.D.	Sampler I.D	Date of	Time of	Date of	Time of Retrieval	Analysis Required	ndoor Air	Outdoor Air	or	Other
	(Location)	1318-AN-LU-011	Deployment 18-Mar-14	Deployment 15:35	Retrieval 9-Apr-14	07:35	VOCs for WMS LU Tube	_	<u> </u>	3	
SS1 SS2		1318-AN-LU-011	18-Mar-14	15:33	9-Apr-14 9-Apr-14		Adrian's analyte suite	: 5			⊢
SS3		1318-AN-LU-012	18-Mar-14	15:42	9-Apr-14		(i.e. PB's analyte suite)			<u> </u>	╋
		1318-AN-LU-014	18-Mar-14	15:54	9-Apr-14		(i.e. i b's analyte suite)	-		<u> </u>	┢
SS-		1318-AN-LU-015	18-Mar-14	15:55	9-Apr-14		Report mass on tube			<u> </u>	┢
SS6		1318-AN-LU-016	18-Mar-14	16:04	9-Apr-14		and concentrations for			—	+
SS7		1318-AN-LU-017	18-Mar-14	16:07	9-Apr-14		samples with known				t
SS8		1318-AN-LU-018	18-Mar-14	16:10	9-Apr-14		uptake rates				┢
SS9		1318-AN-LU-019	18-Mar-14	16:13	9-Apr-14			\vdash			t
SS10	0	1318-AN-LU-020	18-Mar-14	16:17	9-Apr-14	08:03					T
SS1:	1	1318-AN-LU-021	18-Mar-14	16:27	9-Apr-14	08:14					T
SS1	2	1318-AN-LU-022	18-Mar-14	16:33	9-Apr-14	08:17					Г
SS1	3	1318-AN-LU-023	18-Mar-14	16:46	9-Apr-14	08:20		\square			t
SS14	4	1318-AN-LU-024	18-Mar-14	16:59	9-Apr-14	08:35					Γ
SS1	5	1318-AN-LU-025	18-Mar-14	17:07	9-Apr-14	08:39					Г
SS1	6	1318-AN-LU-026	18-Mar-14	17:16	9-Apr-14	08:42		\square			Γ
SS1	7	1318-AN-LU-027	18-Mar-14	17:24	9-Apr-14	08:45					Τ
SS1	8	1318-AN-LU-028	19-Mar-14	10:03	9-Apr-14	08:50					Г
SS1	8 dup	1318-AN-LU-029	19-Mar-14	10:03	9-Apr-14	08:50					T
SS1	9	1318-AN-LU-030	19-Mar-14	10:10	9-Apr-14	08:54					Γ
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	Manager: Adrian Heggie										
	d by: (Print and Sign) Adrian Heggie									ling	
		ail aheggie@pb.con	n.au	Project Info	Luna la sur		Turn Around Time			īġ	
Address State	680 George Street City NSW Post Code 2000	SYDNEY		Purchase Order N Suburb & State: I			Normal:YES			Jon	
Phone:	(02) 9272 5693 Fax:			Project Number:			Rapid:	L	Α̈́ι	ے ہو	
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	(Location)	Sampler I.D	Deployment	Deployment	Retrieval				õ	Š	ð
	SS20	1318-AN-LU-031	19-Mar-14	10:19	9-Apr-14		VOCs for WMS_LU Tube	S			
	SS20 dup	1318-AN-LU-032	19-Mar-14	10:19	9-Apr-14		Adrian's analyte suite				
L	SS21	1318-AN-LU-033	19-Mar-14	10:31	9-Apr-14		(i.e. PB's analyte suite)		\square		
	SS22	1318-AN-LU-034	19-Mar-14	10:40	9-Apr-14			 	\square	\vdash	\vdash
	SS23	1318-AN-LU-035	19-Mar-14	10:48	9-Apr-14		Report mass on tube	<u> </u>	\vdash		\vdash
	SS24	1318-AN-LU-036	19-Mar-14	11:00	9-Apr-14		and concentrations for		\square		\square
	SS25	1318-AN-LU-037	19-Mar-14	11:10	9-Apr-14		samples with known				
	SS26	1318-AN-LU-038	19-Mar-14	11:19	9-Apr-14		uptake rates				
	SS27	1318-AN-LU-039	19-Mar-14	11:30	9-Apr-14	09:46					\square
	SS27 dup	1318-AN-LU-040	19-Mar-14	11:30	9-Apr-14	09:46			\square		
	SS28	1318-AN-LU-041	19-Mar-14	11:44	9-Apr-14	10:22					
	SS29	1318-AN-LU-042	19-Mar-14	11:51	9-Apr-14	10:27					
	SS30	1318-AN-LU-044	19-Mar-14	12:03	9-Apr-14	10:30					
	SS31	1318-AN-LU-045	19-Mar-14	12:12	9-Apr-14	10:35					
	SS32	1318-AN-LU-046	19-Mar-14	12:22	9-Apr-14	10:39					
	SS33	1318-AN-LU-047	19-Mar-14	12:31	9-Apr-14	10:43					
	SS34	1318-AN-LU-048	19-Mar-14	12:39	9-Apr-14						
	SS35	1318-AN-LU-049	19-Mar-14	13:46	9-Apr-14	10:52		1-			
	SS36	1318-AN-LU-050	19-Mar-14	13:55	9-Apr-14			1		'	
	SS37	1318-AN-LU-051	19-Mar-14	14:06	9-Apr-14						
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Passive Sample Collection

Unit 5, 18 Redland Drive Mitcham VIC 3 Ph: (03) 9874

Aitcham VIC 3132 h: (03) 9874 1988 Fax: (03) 9874 1933		S	D- LEEDER CONSULTING		ge 🧾	<u></u> of _	3		
roject Manager: Adrian Heggie ollected by: (Print and Sign) Adrian Heggie ompany Parsons Brinckerhoff Email aheggie@pb. ddress 680 George Street City SYDNEY tate NSW Post Code 2000 hone: (02) 9272 5693 Fax:	:om.au	.au Project Info Purchase Order Number: Suburb & State: Keswick SA Project Number: 2201557a Project Name: Keswick SA				Indoor Air	Outdoor Air	Workplace Monitoring	
Lab ID Field Sample I.D. Sampler I.D (Location)	Date of Deployment	Time of Deployment	Date of Retrieval	Time of Retrieval	Analysis Required		Outd	Work	Other (
SS37 dup 1318-AN-LU-05		4 13:55	9-Apr-14	10:15	VOCs for WMS_LU Tube	S			
TRIP BLANK 1 1318-AN-LU-05		4			Adrian's analyte suite	L			
TRIP BLANK 2 1318-AN-LU-05	4	d			(i.e. PB's analyte suite)	_		\vdash	
		4			Report mass on tube	┢──		\vdash	<u> </u>
					and concentrations for				<u> </u>
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Appendix F

Photographs





Photograph 1. Construction on the site, corner of Everard Ave and Ashford Rd.



Photograph 2. Everard Ave looking west. Construction site on the right side of Everard Ave.



Photograph 3. Looking along Croydon Rd at intersection with Everard Ave. The site is on the left.



Photograph 4. Flux chamber at location PF1, on the road verge along Ashford Road.