Air Monitoring – Dusts / Particulates	Form AQMP07.1

Date:_____

Dusts Visible at Site Boundaries?

7-8am	◇ No	◇ Yes	_____
8-9am	◇ No	◇ Yes	_____
9-10am	◇ No	◇ Yes	_____
10-11am	◇ No	◇ Yes	_____
11-12am	◇ No	◇ Yes	_____
12am-1pm	◇ No	◇ Yes	_____
1-2pm	◇ No	◇ Yes	_____
2-3pm	◇ No	◇ Yes	_____
3-4pm	◇ No	◇ Yes	_____
4-5pm	◇ No	◇ Yes	_____
5-6pm	◇ No	◇ Yes	_____

Dust-Trak Measurements

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Time:_____ Wind Direction & Speed:_____m/s

Completed by:_____

Air Monitoring – Asbestos	AQMP08
Responsibility:	Head Contractor Site Auditor Environmental Consultant
Frequency:	Duration of works in the vicinity of the former Northern Gasholder
Location:	Site boundaries and nearby residential areas
Objective:	To assess compliance with environmental standards for works

Procedure

A program of atmospheric monitoring shall be undertaken throughout the earth works. The extent of required monitoring is described following:

Asbestos

Asbestos containing materials have been identified in shallow soils in the vicinity of the former northern gasholder.

When active excavation works occur in the vicinity of known areas of asbestos impacted fill, or other areas assessed by the environmental consultant as having a high potential to be impacted, asbestos monitoring shall be undertaken.

The potential generation of asbestos fibres shall be assessed by the daily static monitoring for asbestos fibres at three locations on the site boundary. These locations shall consist of at least one upwind and one downwind location. Sampling shall be undertaken in accordance with NIOSH Method 7400 'Asbestos and Other Fibres by PCM'. All results shall be required to meet the acceptance criteria as specified in the NOHSC 'Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres (2^{nd} edition)' of <0.01 fibres/ml.

Where fibres are recorded in downwind locations then the presence of asbestos fibres shall be confirmed by analysis using TEM analysis (as per NIOSH method 7402). Where asbestos fibres are identified then dust control procedures shall be reviewed as in accordance with AQMP03 Dust and Airborne Hazard Control. The recording of asbestos fibres will require a substantial review of work methods in accordance with AQMP09 review.

AQMP Review	AQMP9
Responsibility:	Head Contractor Site Auditor Environmental Consultant RailCorp
Frequency:	Subsequent to environment incidents. Subsequent to changes in program of works.
Location:	Not applicable
Objective:	To ensure that the AQMP is current and appropriate for the site

Procedure

The Air Quality Management Plan shall be reviewed by the Environmental Consultant subsequent to either of the following:

- any environmental incident on the site;
- repeated exceedances of daily monitoring criteria for dust (AQMP 07), asbestos (AQMP 08), VOCs (AQMP 06) and/or odours (AQMP 05); or
- a significant modification to the implemented scope of works.

All new copies of Air Quality Management Plans shall be re-distributed to all parties by the Environmental Consultant. The Environmental Management Plan will require to be updated with the provisions of the revised Air Quality Management Plan.

On finalisation of revision, the Air Quality Management Plan shall be provided to the RailCorp for review / approval. The Authority shall advise acceptability of revisions (or otherwise) within seven days of receipt.

Training	AQMP10
Responsibility:	Head Contractor Environmental Consultant
Frequency:	Throughout implementation of Environmental Management Plan and AQMP
Location:	-
Objective:	To ensure that persons responsible for preparation of the AQMP are competent.

Procedure

Any person who is required to be responsible for technical / monitoring activities in relation to the implementation of the Air Quality Management Plan shall:

- Be inducted as the requirement and method of the specific activity by the Environmental Consultant or their nominated representative;
- Have undertaken the 24 hour Health and Safety Training for Hazardous Waste / Materials under OSHA 29 CFR 1910:120 or equivalent;
- Have an adequately acute sense of smell to allow operation of a nasal ranger (as confirmed by ability to detect n-butanol odour at a level of 40ppb by dynamic olfactometry in accordance with AS/NZS 4323.3:2001; CEN EN 13725:2003); and
- Have completed a Workcover approved Asbestos Removal Supervisor course or equivalent.

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Matt Parkinson/ Sumi Dorairaj	-	Draft for client review	-	26/11/2010
B	Matt Parkinson/ Sumi Dorairaj	Charlie Furr	Charlie Furr		14/12/2010
C	Sumi Dorairaj	Matthew Bennett	Draft for client review		09/08/11

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Appendix C

Calculation of Speciated Constituent Emission Rates

Appendix C – Calculation of Emissions of Speciated Constituents

Chemical specific estimates are required for the following potential emissions of constituents present in soil underlying the site:

- Chemical constituents that are sorbed to particulates released from the remediation works;
- Potentially volatile constituents that volatilise from soils handled on the remediation site; and
- Potentially volatile constituents that volatilise from pooled water as may occur in excavations, or from water treatment infrastructure.

Chemicals Sorbed to Particulates

The release of chemical constituents sorbed to soils has been estimated by simply multiplying the result for dust released by the percentage of impact of the particular constituent that is present in the source soils.

Estimates of constituents as present sorbed to dust particles are required for:

- Assessment to DECCW speciated criteria as provided for 1 hour duration;
- For use in risk calculations to determine levels of risk and hazard as may be posed to surrounding receptors.

Levels of chemical constituents have been assessed for the worse case scenario of air emissions from the site only, as detailed in Section 7.4 and Table 7.5. This has been undertaken by calculation of the product of maximum levels of constituents and maximum 1 hour levels of total suspended particulates to allow comparison to DECCW 1 hour criteria.

Volatilisation During Soil Handling and Stockpiling

The flux of volatile constituents as will potentially volatilise from soils stockpiled and handled on the Barangaroo Headland Park has been required to be estimated. The potential emissions of constituents from contaminated soils into outdoor air can be predicted by the RISC modelling package. RISC provides estimates of vapour emission on the basis of:

- The depth at which the volatile constituents occur;
- The levels at which volatile constituents present;
- Soil properties; and
- Chemical parameters related to the potential volatility of the constituents.

It has been assumed that all constituents are present at a depth of 0.1m. This is a conservative assumption, as the rates of vapour migration and discharge from the soil increase with increasing depth of the constituents from the soil surface. Similar modelling as performed in NZ Ministry for the Environment (1999) 'Users Guide Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand' has recommended a minimum diffusion distance of 0.1m be used in this modelling.

Modelling scenarios have been undertaken on the basis of maximum and average levels of constituents as per a similar logic described for the assessment of chemicals released with particulates. Maximum levels have been used for comparison to DECCW 1 hour

criteria. Average levels have been used for comparison to DECCW annual chemical criteria (for the case of lead) and as a premise for risk and hazard calculations.

Vapour flux rates are reported by RISC from the source of impact in units of $g/cm^2/s$. A unit rate of flux, based on an area of $1m^2$ has been developed for a unit concentration (1mg/kg) of benzene and benzo(a)pyrene by modelling in RISC.

Soil properties for the modelling have been adopted as per the recommended soil properties provided to US EPA (19 June 2003) 'User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings'. The values as provided for sand have been used. Noting the site watering as required with the proposed dust controls, the highest of the recommended range of water filled porosities has been adopted in the modelling to characterise emissions from the site bas subject to dust controls. Standard dru values have been used for the worse case modelling. The soil properties as used in the modelling are summarised in **Table C1** following.

Table C1: Summary of Soil Properties Adopted for Modelling

Soil Property	Adopted Value	Comments
Total porosity	0.375	Sand, as per US EPA (2003)
Water filled porosity – dry sand	0.053	
Water filled porosity – with dust controls	0.253	Value for capillary fringe sands adopted on the basis of stockpile surface being regularly watered in model assumptions. Value as per US EPA (2003)
Fraction organic carbon	0.3	Assumed, consistent with site measurements
Soil bulk density	1.66	Sand, as per US EPA (2003)

A range of chemical parameters are required to characterise the potential volatilisation of soil constituents and movement of soil vapour. The most significant of these are summarised in **Table C2** following.

Table C2: Summary of Physical Properties of COPCs

COPC	Diffusivity in air	Diffusivity in water	Henry's Law constant	Soil-water partition coefficient	Organic carbon partition coefficient	Log of octonal water partition coefficient
	Da (cm2/s)	Dw (cm2/s)	H	KD (cm3/g)	KOC (L/kg)	Log KOW
Benzene	8.95*10-2	1.03*10-5	0.227	-	146	2.13
Benzo(a)pyrene	4.3*10-2	9.0*10-6	1.87*10-5	-	5.87*105	6.13

Model outputs as determine for dry sand and wet sand scenarios have been attached. Results are summarised following:

Table C3: Summary of Predicted Fluxes of Constituent Vapours ($g/m^2/s$ per mg/kg)

Constituent	Unit Flux from Dry Sands	Unit Flux from Wet Sands
Benzene	$6.43*10^{-6}$	$2.16*10^{-7}$
Benzo(a)pyrene	$7.63*10^{-14}$	$3.75*10^{-13}$

The unit flux rates require to be adjusted by the relevant concentration of the constituent for each area of the site where modelling is required. Environmental data for each area of the site is summarised in **Table C4**.

Table C4: Summary of Chemical Data

Parameter / Concentration	Benzene	Benzo(a)pyrene
C_{soil} Maximum, Surface Soils / Hot spots (mg/kg)	4.2[1]	339[1]
C_{soil} Average, Surface Soils / Hot spots (mg/kg)	0.24[1]	31.2[1]
C_{soil} Maximum, Northern Retaining Wall (mg/kg)	15[2]	150[2]
C_{soil} Average, Northern Retaining Wall (mg/kg)	1.2[2]	18.26[2]
C_{soil} Maximum, Northern Gasholder (mg/kg)	15[2]	150[2]
C_{soil} Average, Northern Gasholder (mg/kg)	1.2[2]	18.26[2]
C_{soil} Maximum, Operational Gasworks Area (mg/kg)	20[3]	444[3]
C_{soil} Average, Operational Gasworks Area (mg/kg)	1.4[3]	21[3]

Note: 1. Based on levels of impact reported for surface soils, ash and coke gravels.
2. Based on levels of impact reported for gravel, sand and demolition wastes.
3. Based on the highest of levels of impact reported for the remaining soil types in Table 5.2.

The calculated vapour emission rates for soils handled with the remediation works on the Macdonaldtown Site are summarised in **Tables C5** to **C8** for each of the soil handling scenarios.

Table C5: Estimated Emission Rates – Surface Soils and Contamination Hot Spots

Constituent	Soil Vapour – Maximum ($\mu g/m^2/s$)	Soil Vapour – Average ($\mu g/m^2/s$)
Benzene (dry sand)	2.70E-05	1.54E-06
Benzene (moist sand)	9.07E-07	5.18E-08
Benzo(a)pyrene (dry sand)	2.59E-11	2.38E-12
Benzo(a)pyrene (moist sand)	1.27E-10	1.17E-11

Table C6: Estimated Emission Rates – Fill Materials Behind Northern Retaining Wall

Constituent	Soil Vapour – Maximum ($\mu g/m^2/s$)	Soil Vapour – Average ($\mu g/m^2/s$)
Benzene (dry sand)	9.65E-05	7.72E-06
Benzene (moist sand)	3.24E-06	2.59E-07
Benzo(a)pyrene (dry sand)	1.14E-11	1.39E-12
Benzo(a)pyrene (moist sand)	5.63E-11	6.85E-12

Table C7: Estimated Emission Rates – Fill Materials Within Northern Gasholder

Constituent	Soil Vapour – Maximum (µg/m²/s)	Soil Vapour – Average (µg/m²/s)
Benzene (dry sand)	9.65E-05	7.72E-06
Benzene (moist sand)	3.24E-06	2.59E-07
Benzo(a)pyrene (dry sand)	1.14E-11	1.39E-12
Benzo(a)pyrene (moist sand)	5.63E-11	6.85E-12

Table C8: Estimated Emission Rates –Impacted Soils in Former Operational Gasworks Area

Constituent	Soil Vapour – Maximum (µg/m²/s)	Soil Vapour – Average (µg/m²/s)
Benzene (dry sand)	1.29E-04	9.00E-06
Benzene (moist sand)	4.32E-06	3.02E-07
Benzo(a)pyrene (dry sand)	3.39E-11	1.60E-12
Benzo(a)pyrene (moist sand)	1.67E-10	7.88E-12

The benzo(a)pyrene estimates of volatilisation and vapour generation are observed to be insignificant in relation to the benzo(a)pyrene criteria and the emissions of benzene. On this basis, the potential emissions of benzo(a)pyrene as soil vapours from soils have not been considered further in the modelling.

Volatilisation during Transfer of Groundwater

It has been assumed that transfer of groundwater consists of splash filling of storage vessels with transferred groundwater. Vapours are released from the shower that is formed by the transfer of the groundwater. The shower model as provided by NZ Ministry for the Environment (1999) has been used to estimate vapour emissions from this scenario.

The parameters provided to NZ Ministry for the Environment (1999) have been used to characterise the shower. It has been assumed that a droplet diameter is equal to 0.2m as advised by NZ Ministry for the Environment (1999). However a substantially reduced shower drop time of 1s has been used, in recognition that water is being discharged into a holding tank. Noting the likely limitations on the treatment system used to treat impacted water, it has been assumed that water is supplied at a rate of 60L/min (1L/s). A water temperature of 23°C has been used. As noted in the main document this is considered by JBS to be substantially below the likely inflow of groundwater into deep excavations or the emplaced trench. Results are summarised in **Table C9**.

Table C9: Estimated Emission Rates – Volatilisation from Transferred Water

Constituent	Vapour – Maximum (g/s)
Benzene	$9.7*10^{-3}$
Benzo(a)pyrene	$8*10^{-5}$

Volatilisation from Pooled Groundwater in Deep Excavation

Chemical constituents are found to be dissolved in groundwater, and would be anticipated to be similarly dissolved in groundwater that may pool within the deep excavation as placed on the site. It would be anticipated that where evaporation of pooled dewater

occurs that dissolved constituents would be present in the water vapour at the same levels as the water mass. A water evaporation equation has simply been used, with the results adjusted for the proportion of water vapour anticipated to consist of the particular constituent. The dimensions of the northern gasholder have been used for the purposes of these calculations. The extent of the northern gasholder and the proximity to the nearest residential receptors causes this to be the most conservative scenario. Results are summarised in **Table C10**.

Table C10: Estimated Emission Rates – Volatilisation from Pooled Water

Constituent	Vapour – Maximum ($g/m^2/s$)
Benzene	$7.8*10^{-5} * U^{0.8}/T^{1.47}$
Benzo(a)pyrene	$1.6*10^{-5} * U^{0.8}/T^{1.47}$

By reference to **Table C10**, U is the wind speed over the water surface, as measured in m/s. This has been set equal to 10% of the wind speed in the meteorological data for each record based on the reduced wind speed within a sub-surface excavation as compared to a 10m high anemometer.

T is the ambient temperature of the water which is measured in Kelvin. It is noted that the vapour pressure of water has been set at 20°C in using the model. Though the vapour pressure would be anticipated to vary with changes in atmospheric temperatures. The amount of variation over the value as adopted at 20°C is not considered to be significant to vary this within the model.

Dry Sands Flux Estimates

FATE AND TRANSPORT MODEL OUTPUT FOR: Benzene

Start of model output for:
Johnson and Ettinger model for outdoor air
with volatile emissions from soil

Calculating Vapor Phase Concentration at Source:
(Using Equilibrium Partitioning Equation)

Inputs:

Total concentration in soil [mg/kg].....	1.0
Total porosity [-].....	0.38
Air content [-].....	0.32
Moisture content [-].....	5.30E-02
Fraction organic carbon [-].....	3.00E-03
Organic carbon partitioning coeff. [ml/g]...	1.46E+02
Soil bulk density [g/cm3].....	1.7
Henrys Law coeff. [-].....	0.23
Chemical solubility [mg/l].....	1.79E+03

Outputs:

Calculated dissolved phase conc. [mg/l].....	1.9
Effective solubility [mg/l].....	1.79E+03

Source concentration is BELOW residual limit
because calculated dissolved phase conc.
is LESS than the effective solubility.

Dissolved phase conc. at source [mg/l].....	1.9
Source vapor concentration [g/cm^3].....	4.42E-07
Source vapor concentration [mg/m^3].....	4.42E+02
Residual level [mg/kg].....	9.20E+02

(assuming pure chemical solubility)

VAPOR TRANSPORT FROM SOIL TO OUTDOOR AIR

Effective Diffusion Coefficient for Vadose zone

Total thickness of subunit [cm]..... 10.

Air-filled porosity [-]..... 0.32

Water-filled porosity [-]..... 5.30E-02

Total porosity [-]..... 0.38

Effective diff. coeff. for subunit....[cm^2/s] 1.46E-02

Overall Effective Diffusion Coefficient (for all layers)

Overall diffusion path length [cm]..... 10.

Overall effective diffusion coefficient [cm^2/s]... 1.46E-02

Vapor Concentration and Flux at Source

Initial vapor conc. at source [g/cm^3]..... 4.42E-07

Initial vapor conc. at source [mg/m^3]..... 4.42E+02

Initial vapor flux rate [g/cm^2/s]..... 6.43E-10

Soil gas flow rate is zero (advection not considered in this model).

OUTDOOR AIR CONCENTRATION

Benzene

Time (yr)	Concentration Outdoors (mg/m^3)
1.0	1.61E-02

This is a steady-state model.

FATE AND TRANSPORT MODEL OUTPUT FOR: Benzo(a)pyrene

Start of model output for:
Johnson and Ettinger model for outdoor air
with volatile emissions from soil

Calculating Vapor Phase Concentration at Source:
(Using Equilibrium Partitioning Equation)

Inputs:

Total concentration in soil [mg/kg].....	1.0
Total porosity [-].....	0.38
Air content [-].....	0.32
Moisture content [-].....	5.30E-02
Fraction organic carbon [-].....	3.00E-03
Organic carbon partitioning coeff. [ml/g]...	5.87E+05
Soil bulk density [g/cm3].....	1.7
Henrys Law coeff. [-].....	1.87E-05
Chemical solubility [mg/l].....	1.62E-03

Outputs:

Calculated dissolved phase conc. [mg/l].....	5.68E-04
Effective solubility [mg/l].....	1.62E-03

Source concentration is BELOW residual limit
because calculated dissolved phase conc.
is LESS than the effective solubility.

Dissolved phase conc. at source [mg/l].....	5.68E-04
Source vapor concentration [g/cm^3].....	1.06E-14
Source vapor concentration [mg/m^3].....	1.06E-05
Residual level [mg/kg].....	2.9

(assuming pure chemical solubility)

VAPOR TRANSPORT FROM SOIL TO OUTDOOR AIR

Effective Diffusion Coefficient for Vadose zone

Total thickness of subunit [cm].....	10.

Air-filled porosity [-]..... 0.32

Water-filled porosity [-]..... 5.30E-02

Total porosity [-]..... 0.38

Effective diff. coeff. for subunit....[cm^2/s] 7.19E-03

Overall Effective Diffusion Coefficient (for all layers)

Overall diffusion path length [cm]..... 10.

Overall effective diffusion coefficient [cm^2/s]... 7.19E-03

Vapor Concentration and Flux at Source

Initial vapor conc. at source [g/cm^3]..... 1.06E-14

Initial vapor conc. at source [mg/m^3]..... 1.06E-05

Initial vapor flux rate [g/cm^2/s]..... 7.63E-18

Soil gas flow rate is zero (advection not considered in this model).

OUTDOOR AIR CONCENTRATION

Benzo(a)pyrene

Time (yr)	Concentration Outdoors (mg/m^3)
1.0	1.91E-10

This is a steady-state model.

Moist Sands (Dust Controls) Flux Estimates

FATE AND TRANSPORT MODEL OUTPUT FOR: Benzene

Start of model output for:
Johnson and Ettinger model for outdoor air
with volatile emissions from soil

Calculating Vapor Phase Concentration at Source:
(Using Equilibrium Partitioning Equation)

Inputs:

Total concentration in soil [mg/kg].....	1.0
Total porosity [-].....	0.38
Air content [-].....	0.12
Moisture content [-].....	0.25
Fraction organic carbon [-].....	3.00E-03
Organic carbon partitioning coeff. [ml/g]...	1.46E+02
Soil bulk density [g/cm3].....	1.7
Henrys Law coeff. [-].....	0.23
Chemical solubility [mg/l].....	1.79E+03

Outputs:

Calculated dissolved phase conc. [mg/l].....	1.6
Effective solubility [mg/l].....	1.79E+03

Source concentration is BELOW residual limit
because calculated dissolved phase conc.
is LESS than the effective solubility.

Dissolved phase conc. at source [mg/l].....	1.6
Source vapor concentration [g/cm^3].....	3.74E-07
Source vapor concentration [mg/m^3].....	3.74E+02
Residual level [mg/kg].....	1.09E+03

(assuming pure chemical solubility)

VAPOR TRANSPORT FROM SOIL TO OUTDOOR AIR

Effective Diffusion Coefficient for Vadose zone

Total thickness of subunit [cm]..... 10.

Air-filled porosity [-]..... 0.12

Water-filled porosity [-]..... 0.25

Total porosity [-]..... 0.38

Effective diff. coeff. for subunit....[cm^2/s] 5.76E-04

Overall Effective Diffusion Coefficient (for all layers)

Overall diffusion path length [cm]..... 10.

Overall effective diffusion coefficient [cm^2/s]... 5.76E-04

Vapor Concentration and Flux at Source

Initial vapor conc. at source [g/cm^3]..... 3.74E-07

Initial vapor conc. at source [mg/m^3]..... 3.74E+02

Initial vapor flux rate [g/cm^2/s]..... 2.16E-11

Soil gas flow rate is zero (advection not considered in this model).

OUTDOOR AIR CONCENTRATION

Benzene

Time (yr)	Concentration Outdoors (mg/m^3)
1.0	5.39E-04

This is a steady-state model.

FATE AND TRANSPORT MODEL OUTPUT FOR: Benzo(a)pyrene

Start of model output for:
Johnson and Ettinger model for outdoor air
with volatile emissions from soil

Calculating Vapor Phase Concentration at Source:
(Using Equilibrium Partitioning Equation)

Inputs:

Total concentration in soil [mg/kg].....	1.0
Total porosity [-].....	0.38
Air content [-].....	0.12
Moisture content [-].....	0.25
Fraction organic carbon [-].....	3.00E-03
Organic carbon partitioning coeff. [ml/g]...	5.87E+05
Soil bulk density [g/cm3].....	1.7
Henrys Law coeff. [-].....	1.87E-05
Chemical solubility [mg/l].....	1.62E-03

Outputs:

Calculated dissolved phase conc. [mg/l].....	5.68E-04
Effective solubility [mg/l].....	1.62E-03

Source concentration is BELOW residual limit
because calculated dissolved phase conc.
is LESS than the effective solubility.

Dissolved phase conc. at source [mg/l].....	5.68E-04
Source vapor concentration [g/cm^3].....	1.06E-14
Source vapor concentration [mg/m^3].....	1.06E-05
Residual level [mg/kg].....	2.9

(assuming pure chemical solubility)

VAPOR TRANSPORT FROM SOIL TO OUTDOOR AIR

Effective Diffusion Coefficient for Vadose zone

Total thickness of subunit [cm].....	10.
Air-filled porosity [-].....	0.12

Water-filled porosity [-]..... 0.25

Total porosity [-]..... 0.38

Effective diff. coeff. for subunit....[cm^2/s] 3.53E-02

Overall Effective Diffusion Coefficient (for all layers)

Overall diffusion path length [cm]..... 10.

Overall effective diffusion coefficient [cm^2/s]... 3.53E-02

Vapor Concentration and Flux at Source

Initial vapor conc. at source [g/cm^3]..... 1.06E-14

Initial vapor conc. at source [mg/m^3]..... 1.06E-05

Initial vapor flux rate [g/cm^2/s]..... 3.75E-17

Soil gas flow rate is zero (advection not considered in this model).

OUTDOOR AIR CONCENTRATION

Benzo(a)pyrene

Time (yr)	Concentration Outdoors (mg/m^3)
1.0	9.38E-10

This is a steady-state model.

Appendix D

AUSPLUME Modelling Results and Modelling Files Outputs Controlled Conditions

AUSPLUME EMISSION RATE CALCULATIONS

										kg/tonne	m3/day	tonnes/day		kg/m2/sec	g/m2/sec uncontrolled	g/m2/sec with controls
Surface soils, excavation and stockpiling	TSP	VEX1T	Area	20	20	45	332314	6247685	16.5	2.81E-02	500	650	4.57E-02	1.2684E-06	1.27E-03	3.30E-04
	PM_{10}	VEX1P	Area	20	20	45	332314	6247685	16.5	1.33E-02	500	650	2.16E-02	6.00347E-07	6.00E-04	1.56E-04
	Benzene (max)	VEX1BE	Area	20	20	45	332314	6247685	16.5	1.18E-08	500	650	1.92E-08	5.32639E-13	5.33E-10	1.38E-10
										6.74E-09	500	650	-	-	-	-
	B(a)P (max)	VEX1BP	Area	20	20	45	332314	6247685	16.5	9.53E-06	500	650	1.55E-05	4.30174E-10	4.30E-07	1.12E-07
										8.77E-07	500	650	-	-	-	-
Fill materials behind retaining wall, excavation and stockpiling	TSP	VEX2T	Area	50	5	80	332271	6247720	18	2.81E-02	300	390	4.38E-02	1.21767E-06	1.22E-03	3.17E-04
	PM_{10}	VEX2P	Area	50	5	80	332271	6247720	18	1.33E-02	300	390	2.07E-02	5.76333E-07	5.76E-04	1.50E-04
	Benzene (max)	VEX2BE	Area	50	5	80	332271	6247720	18	4.22E-07	300	390	6.58E-07	1.82867E-11	1.83E-08	4.75E-09
				50	5					-	-	-	-	-	-	-
	B(a)P (max)	VEX2BP	Area	50	5	80	332271	6247720	18	4.22E-06	300	390	6.58E-06	1.82867E-10	1.83E-07	4.75E-08
				50	5					-	-	-	-	-	-	-
Northern Gasholder, excavation and stockpiling	TSP	VEX3T	Area	20	20	0	332276	6247697	17.5	2.81E-02	100	130	9.13E-03	2.53681E-07	2.54E-04	2.54E-06
	PM_{10}	VEX3P	Area	20	20	0	332276	6247697	17.5	1.33E-02	100	130	4.32E-03	1.20069E-07	1.20E-04	1.20E-06
	Benzene (max)	VEX3BE	Area	20	20	0	332276	6247697	17.5	4.22E-07	100	130	1.37E-07	3.80972E-12	3.81E-09	3.81E-11
	B(a)P (max)	VEX3BP	Area	20	20	0	332276	6247697	17.5	4.22E-06	100	130	1.37E-06	3.80972E-11	3.81E-08	3.81E-10
Former gasworks area, excavation and stockpiling	TSP	VEX4T	Area	15	15	0	332296	6247695	17.5	2.81E-02	200	260	3.25E-02	9.01975E-07	9.02E-04	9.02E-06
	PM_{10}	VEX4P	Area	15	15	0	332296	6247695	17.5	1.33E-02	200	260	1.54E-02	4.26914E-07	4.27E-04	4.27E-06
	Benzene (max)	VEX4BE	Area	15	15	0	332296	6247695	17.5	5.67E-07	200	260	6.55E-07	1.82E-11	1.82E-08	1.82E-10
										-	-	-	-	-	-	-
	B(a)P (max)	VEX4BP	Area	15	15	0	332296	6247695	17.5	0.0000125	200	260	1.44E-05	4.01235E-10	4.01E-07	4.01E-09
										-	-	-	-	-	-	-

Surface Soils and Hotspot Excavations

TSP	Annual		variable	3.02E+00	9.10E+00	1.31E+01	1.18E+00	1.14E+01	1.15E+01	VEX1T
			fugitive	2.39E-03	8.74E-03	1.64E-02	5.90E-03	1.83E-02	1.32E-02	F1T
		90	sum	3.02E+00	9.11E+00	1.31E+01	1.19E+00	1.14E+01	1.15E+01	SUM
PM_{10}	24 hour		variable	1.40E+01	3.70E+01	2.91E+01	5.89E+00	1.99E+01	2.45E+01	VEX1P
			fugitive	8.99E-03	4.52E-02	7.18E-02	1.74E-02	5.79E-02	5.52E-02	F1P
		50	sum	1.40E+01	3.70E+01	2.92E+01	5.91E+00	2.00E+01	2.46E+01	SUM
PM_{10}	Annual		variable	1.42E+00	4.28E+00	6.16E+00	5.56E-01	5.36E+00	5.43E+00	VEX1P
			fugitive	1.16E-03	4.24E-03	7.95E-03	2.87E-03	8.89E-03	6.43E-03	F1P
		30	sum	1.42E+00	4.28E+00	6.17E+00	5.59E-01	5.37E+00	5.44E+00	SUM
Benzene	1 hour		variable	3.16E-03	1.16E-02	1.16E-02	3.18E-03	9.67E-03	1.16E-02	VEX1BE
			fugitive	1.00E-06	3.70E-06	4.39E-06	1.48E-06	3.70E-06	4.64E-06	F1BEP+F1BEV
		29	sum	3.16E-03	1.16E-02	1.16E-02	3.18E-03	9.67E-03	1.16E-02	SUM
Benzo(a)pyrene	1 hour		variable	2.29E-02	8.39E-02	8.42E-02	2.30E-02	6.90E-02	8.40E-02	VEX1BP
			fugitive	6.21E-05	2.30E-04	2.73E-04	9.16E-05	2.29E-04	2.88E-04	F1BPP
		0.4	sum	2.30E-02	8.41E-02	8.45E-02	2.31E-02	6.92E-02	8.43E-02	SUM

Northern Retaining Wall Excavation

TSP	Annual		variable	1.39E+00	2.02E+01	2.76E+00	2.03E-01	1.35E+00	7.27E+00	VEX2T
			fugitive	4.03E-03	3.48E-02	2.56E-02	3.69E-03	1.86E-02	3.08E-02	F2T
		90	sum	1.39E+00	2.02E+01	2.79E+00	2.07E-01	1.37E+00	7.30E+00	SUM
PM_{10}	24 hour		variable	1.66E+00	3.14E+01	1.83E+00	3.05E-01	1.15E+00	3.70E+00	VEX2P
			fugitive	1.45E-01	1.74E+00	8.00E-01	1.43E-01	5.36E-01	8.08E-01	F2P
		50	sum	1.81E+00	3.31E+01	2.63E+00	4.48E-01	1.69E+00	4.51E+00	SUM
PM_{10}	Annual		variable	2.39E-01	4.12E+00	3.70E-01	3.09E-02	1.88E-01	9.43E-01	VEX2P
			fugitive	2.01E-02	1.74E-01	1.28E-01	1.84E-02	9.28E-02	1.54E-01	F2P
		30	sum	2.59E-01	4.29E+00	4.98E-01	4.93E-02	2.81E-01	1.10E+00	SUM
Benzene	1 hour		variable	1.24E-02	1.08E-02	7.12E-03	6.11E-04	3.87E-03	8.43E-03	VEX2BE
			fugitive	2.44E-04	1.61E-03	9.68E-04	2.30E-04	8.27E-04	8.30E-04	F2BEP+F2BEV
		29	sum	1.26E-02	1.24E-02	8.09E-03	8.41E-04	4.70E-03	9.26E-03	SUM
Benzo(a)pyrene	1 hour		variable	4.49E-03	5.77E-02	1.22E-02	1.62E-03	7.95E-03	2.53E-02	VEX2BP
			fugitive	1.34E-03	1.06E-02	3.20E-03	8.48E-04	2.36E-03	4.61E-03	F2BPP
		0.4	sum	5.83E-03	6.83E-02	1.54E-02	2.47E-03	1.03E-02	2.99E-02	SUM
Odour	1 second	2 OU	variable	1.29E-01	5.77E-01	2.35E-01	8.89E-02	1.90E-01	3.16E-01	VEX2OU
			fugitive	6.29E-02	4.79E-01	1.50E-01	3.97E-02	1.11E-01	3.16E-01	F2OU
			sum	1.92E-01	1.06E+00	3.85E-01	1.29E-01	3.01E-01	6.32E-01	SUM

Northern Gasholder Excavation

TSP	Annual		variable	5.29E-02	4.68E-01	1.60E-01	8.98E-03	8.14E-02	3.36E-01	VEX3T
			fugitive	1.24E-04	6.92E-04	9.36E-04	1.69E-04	8.18E-04	9.46E-04	F3T
		90	sum	5.30E-02	4.69E-01	1.61E-01	9.15E-03	8.22E-02	3.37E-01	SUM
PM_{10}	24 hour		variable	2.54E-02	2.24E-03	7.69E-04	4.31E-05	3.91E-04	1.61E-03	VEX3P
			fugitive	4.85E-04	3.75E-03	2.64E-03	6.10E-04	2.76E-03	4.21E-03	F3P
		50	sum	2.59E-02	5.99E-03	3.41E-03	6.53E-04	3.15E-03	5.82E-03	SUM
PM_{10}	Annual		variable	1.73E-01	1.92E+00	3.02E-01	4.55E-02	1.79E-01	5.70E-03	VEX3P
			fugitive	6.41E-05	3.59E-04	4.85E-04	8.76E-05	4.24E-04	4.90E-04	F3P
		30	sum	1.73E-01	1.92E+00	3.02E-01	4.56E-02	1.79E-01	6.19E-03	SUM
Benzene	1 hour		variable	1.69E-05	1.51E-04	6.34E-05	7.89E-06	3.71E-05	1.00E-04	VEX3BE
			fugitive	6.21E-07	3.35E-06	2.07E-06	5.51E-07	1.56E-06	2.71E-06	F3BEP+F3BEV
		29	sum	1.75E-05	1.54E-04	6.55E-05	8.44E-06	3.87E-05	1.03E-04	SUM
Benzo(a)pyrene	1 hour		variable	1.69E-04	1.51E-03	6.34E-04	7.89E-05	3.71E-04	1.00E-03	VEX3BP
			fugitive	1.84E-06	9.95E-06	6.15E-06	1.64E-06	4.63E-06	8.07E-06	F3BPP
		0.4	sum	1.71E-04	1.52E-03	6.40E-04	8.05E-05	3.76E-04	1.01E-03	SUM
Odour	1 second	2 OU	variable	1.73E-04	1.53E-03	6.46E-04	8.22E-05	3.80E-04	1.02E-03	VEX2OU
			fugitive	3.28E-02	1.77E-01	1.10E-01	2.92E-02	8.24E-02	1.44E-01	F2OU
			sum	3.30E-02	1.79E-01	1.11E-01	2.93E-02	8.28E-02	1.45E-01	SUM

Former Gasworks Areas

TSP	Annual		variable	9.44E-02	4.74E-01	3.51E-01	1.89E-02	2.14E-01	4.90E-01	VEX4T
			fugitive	1.16E-05	6.32E-05	1.00E-04	1.81E-05	8.82E-05	9.49E-05	F4T
		90	sum	9.44E-02	4.74E-01	3.51E-01	1.89E-02	2.14E-01	4.90E-01	SUM
PM_{10}	24 hour		variable	3.84E-01	1.78E+00	6.40E-01	1.07E-01	4.12E-01	1.06E+00	VEX4P
			fugitive	4.50E-05	2.76E-04	3.19E-04	6.65E-04	2.94E-04	4.31E-04	F4P
		50	sum	3.84E-01	1.78E+00	6.40E-01	1.08E-01	4.12E-01	1.06E+00	SUM
PM_{10}	Annual		variable	4.51E-02	2.26E-02	1.68E-01	9.03E-03	1.02E-01	2.34E-01	VEX4P
			fugitive	5.99E-06	3.28E-05	5.35E-05	9.39E-06	4.57E-05	4.92E-05	F4P
		30	sum	4.51E-02	2.26E-02	1.68E-01	9.04E-03	1.02E-01	2.34E-01	SUM
Benzene	1 hour		variable	4.20E-05	2.46E-04	1.52E-04	2.37E-05	1.11E-04	1.95E-04	VEX4BE
			fugitive	2.83E-04	1.44E-03	1.13E-03	2.86E-04	8.45E-04	1.45E-05	F4BEP + F4BEV
		29	sum	3.25E-04	1.69E-03	1.28E-03	3.10E-04	9.56E-04	2.10E-04	SUM
Benzo(a)pyrene	1 hour		variable	9.33E-04	5.46E-03	3.38E-03	5.27E-04	2.46E-03	4.32E-03	VEX4BP
			fugitive	5.07E-06	2.57E-05	2.02E-05	5.12E-06	1.51E-05	2.59E-05	F4BPP
		0.4	sum	9.38E-04	5.49E-03	3.40E-03	5.32E-04	2.48E-03	4.35E-03	SUM
Odour	1 second	2 OU	variable	6.95E-02	3.34E-01	2.47E-01	6.82E-02	1.90E-01	3.11E-01	VEX4OU
			fugitive	3.09E-02	1.56E-01	1.23E-01	3.11E-02	9.21E-02	1.58E-01	F4OU
			sum	1.00E-01	4.90E-01	3.70E-01	9.93E-02	2.82E-01	4.69E-01	

Haulage Roads

TSP	Annual	90	fugitive	3.59E-01	1.26E+00	2.22E+00	6.02E-01	2.15E+00	1.93E+00	HAT
PM_{10}	24 hour	50	fugitive	1.72E+00	6.83E+00	9.83E+00	2.43E+00	6.79E+00	7.99E+00	HAP
PM_{10}	Annual	30	fugitive	2.25E-01	7.91E-01	1.39E+00	3.77E-01	1.35E+00	1.21E+00	HAP

Bioremediation of Soils

				Receptor Location						AUSPLUME
				1	2	3	4	5	6	
TSP	Annual	90	fugitive	7.70E-04	1.60E-03	2.74E-03	3.16E-03	3.00E-03	2.12E-03	T2T
PM_{10}	24 hour	50	fugitive	3.08E-03	7.31E-03	9.55E-03	9.14E-03	1.21E-02	8.32E-03	T2PM
PM_{10}	Annual	30	fugitive	3.99E-04	8.29E-04	1.42E-03	1.64E-03	1.56E-03	1.15E-03	T2PM
Benzene	1 hour	29	fugitive	1.64E-06	3.69E-06	2.59E-06	2.31E-06	2.49E-06	2.70E-06	T2BEP
			fugitive	3.94E-06	8.88E-06	6.23E-07	5.55E-06	5.98E-06	6.50E-06	T2BEV
				5.58E-06	1.26E-05	3.21E-06	7.86E-06	8.47E-06	9.20E-06	sum
Benzo(a)pyrene	1 hour	0.4	fugitive	3.64E-05	8.02E-05	5.75E-05	5.12E-05	5.52E-05	6.00E-05	T2BPP results times 0.001
Odour	1 second	2 OU		2.21E-01	4.94E-01	3.50E-01	3.12E-01	3.36E-01	3.65E-01	T2ou

Groudnwater Emissions and Water Treatment

				Receptor Location						AUSPLUME
				1	2	3	4	5	6	
Benzene	1 hour	29	fugitive	1.03E-01	6.35E-01	4.55E-01	9.83E-02	3.21E-01	6.19E-01	WTBE
				3.47E-01	3.10E+00	1.30E+00	1.62E-01	7.62E-01	2.05E+00	PWBE
				4.50E-01	3.74E+00	1.76E+00	2.60E-01	1.08E+00	2.67E+00	sum
Benzo(a)pyrene	1 hour	0.4	fugitive	9.05E-04	5.56E-03	3.98E-03	8.16E-04	2.80E-03	5.39E-03	WTBP
				7.12E-02	6.36E-01	2.67E-01	3.32E-02	1.56E-01	4.21E-01	PWBP
				7.21E-02	6.42E-01	2.71E-01	3.40E-02	1.59E-01	4.26E-01	sum
Odour	1 second	2 OU	fugitive	9.98E-04	1.71E-03	1.56E-03	3.47E-04	5.36E-04	1.02E-03	TOU

Surface Soils – Excavation and Stockpiling

1

40913 Macdonaldtown VEX1 variable sources

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown VEX1 variable sources

SOURCE GROUPS

Group No.	Members
1	VEX1T
2	VEX1P
3	VEX1BE
4	VEX1BP

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1 _____

40913 Macdonaldtown VEX1 variable sources

SOURCE CHARACTERISTICS

_____

INTEGRATED AREA SOURCE: VEX1T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	20m	20m	45deg	5m	0m

(Constant) emission rate = 3.30E-04 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX1P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	20m	20m	45deg	5m	0m

(Constant) emission rate =1.56E-04 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX1BE

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	20m	20m	45deg	5m	0m

(Constant) emission rate = 1.38E-10 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX1BP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	20m	20m	45deg	5m	0m

(Constant) emission rate = 1.12E-07 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

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1 _____

40913 Macdonaldtown VEX1 variable sources

RECEPTOR LOCATIONS

_____

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5
3	332259	6247645	21.5	1.5	6	332252	6247669	17.0	1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

HOURLY VARIABLE EMISSION FACTOR INFORMATION

The input emission rates specfied above will be multiplied by hourly varying factors entered via the input file:
C:\Users\sdorairaj\Ausplume\New folder (2)\RandExVar.csv
For each stack source, hourly values within this file will be added to each declared exit velocity (m/sec) and temperature (K).

Title of input hourly emission factor file is:
Variable Emissions,,

HOURLY EMISSION FACTOR SOURCE TYPE ALLOCATION

Prefix V allocated: VEX1T VEX1P VEX1BE VEX1BP

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 7.43E+01 @Hr15,08/06/07 4: 7.47E+01 @Hr08,04/07/07
2: 2.73E+02 @Hr07,16/06/07 5: 2.27E+02 @Hr16,28/01/07
3: 2.74E+02 @Hr16,05/02/07 6: 2.73E+02 @Hr16,18/02/07

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 3.50E+01 @Hr15,08/06/07 4: 3.51E+01 @Hr08,04/07/07
2: 1.28E+02 @Hr07,16/06/07 5: 1.07E+02 @Hr16,28/01/07
3: 1.29E+02 @Hr16,05/02/07 6: 1.29E+02 @Hr16,18/02/07

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3

At the discrete receptors:

1: 3.16E+00 @Hr15,08/06/07 4: 3.18E+00 @Hr08,04/07/07
2: 1.16E+01 @Hr07,16/06/07 5: 9.67E+00 @Hr16,28/01/07
3: 1.16E+01 @Hr16,05/02/07 6: 1.16E+01 @Hr16,18/02/07

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 2.29E+00 @Hr15,08/06/07 4: 2.30E+00 @Hr08,04/07/07
2: 8.39E+00 @Hr07,16/06/07 5: 6.99E+00 @Hr16,28/01/07
3: 8.42E+00 @Hr16,05/02/07 6: 8.40E+00 @Hr16,18/02/07

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 2.98E+01 @Hr24,08/06/07 4: 1.25E+01 @Hr24,17/05/08
2: 7.87E+01 @Hr24,16/06/07 5: 4.23E+01 @Hr24,02/01/07
3: 6.18E+01 @Hr24,02/01/07 6: 5.20E+01 @Hr24,06/09/07

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.40E+01 @Hr24,08/06/07 4: 5.89E+00 @Hr24,17/05/08
2: 3.70E+01 @Hr24,16/06/07 5: 1.99E+01 @Hr24,02/01/07
3: 2.91E+01 @Hr24,02/01/07 6: 2.45E+01 @Hr24,06/09/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.27E+00 @Hr24,08/06/07 4: 5.32E-01 @Hr24,17/05/08
2: 3.35E+00 @Hr24,16/06/07 5: 1.80E+00 @Hr24,02/01/07
3: 2.63E+00 @Hr24,02/01/07 6: 2.21E+00 @Hr24,06/09/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 9.16E-01 @Hr24,08/06/07 4: 3.85E-01 @Hr24,17/05/08
2: 2.42E+00 @Hr24,16/06/07 5: 1.30E+00 @Hr24,02/01/07
3: 1.90E+00 @Hr24,02/01/07 6: 1.60E+00 @Hr24,06/09/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 3.02E+00 @Hr24,07/01/08 4: 1.18E+00 @Hr24,28/12/08
2: 9.10E+00 @Hr24,18/01/08 5: 1.14E+01 @Hr24,02/04/07
3: 1.31E+01 @Hr24,01/04/07 6: 1.15E+01 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.42E+00 @Hr24,07/01/08 4: 5.56E-01 @Hr24,28/12/08
2: 4.28E+00 @Hr24,18/01/08 5: 5.36E+00 @Hr24,02/04/07
3: 6.16E+00 @Hr24,01/04/07 6: 5.43E+00 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.28E-01 @Hr24,07/01/08 4: 5.02E-02 @Hr24,28/12/08
2: 3.87E-01 @Hr24,18/01/08 5: 4.84E-01 @Hr24,02/04/07
3: 5.57E-01 @Hr24,01/04/07 6: 4.91E-01 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4

At the discrete receptors:

1: 9.16E-01 @Hr24,08/06/07 4: 3.85E-01 @Hr24,17/05/08
2: 2.42E+00 @Hr24,16/06/07 5: 1.30E+00 @Hr24,02/01/07
3: 1.90E+00 @Hr24,02/01/07 6: 1.60E+00 @Hr24,06/09/07

Surface Soils – Fugitive Emissions

1

40913 Macdonaldtown F1 fugitive emission

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown F1 fugitive emission

SOURCE GROUPS

Group No.	Members
1	F1T
2	F1P
3	F1BE
4	F1BP

1

40913 Macdonaldtown F1 fugitive emission

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: F1T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	10m	10m	45deg	5m	0m

(Constant) emission rate = 7.00E-07 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F1P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	10m	10m	45deg	5m	0m

(Constant) emission rate = 3.40E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F1BE

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	10m	10m	45deg	5m	0m

(Constant) emission rate = 2.90E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F1BP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332314	6247685	17m	10m	10m	45deg	5m	0m

(Constant) emission rate = 1.80E-06 grams/second per square metre
No gravitational settling or scavenging.

1

40913 Macdonaldtown F1 fugitive emission

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5
3	332259	6247645	21.5	1.5	6	332252	6247669	17.0	1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 2.41E-01 @Hr24,17/10/08 4: 3.56E-01 @Hr21,27/08/07
2: 8.93E-01 @Hr20,13/03/07 5: 8.92E-01 @Hr21,04/05/08
3: 1.06E+00 @Hr22,02/09/07 6: 1.12E+00 @Hr18,13/07/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.17E+00 @Hr24,17/10/08 4: 1.73E+00 @Hr21,27/08/07
2: 4.34E+00 @Hr20,13/03/07 5: 4.33E+00 @Hr21,04/05/08
3: 5.15E+00 @Hr22,02/09/07 6: 5.44E+00 @Hr18,13/07/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.00E+00 @Hr24,17/10/08 4: 1.48E+00 @Hr21,27/08/07
2: 3.70E+00 @Hr20,13/03/07 5: 3.70E+00 @Hr21,04/05/08
3: 4.39E+00 @Hr22,02/09/07 6: 4.64E+00 @Hr18,13/07/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 6.21E-01 @Hr24,17/10/08 4: 9.16E-01 @Hr21,27/08/07
2: 2.30E+00 @Hr20,13/03/07 5: 2.29E+00 @Hr21,04/05/08
3: 2.73E+00 @Hr22,02/09/07 6: 2.88E+00 @Hr18,13/07/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 1.85E-02 @Hr24,24/12/08 4: 3.59E-02 @Hr24,08/05/07
2: 9.31E-02 @Hr24,04/02/07 5: 1.19E-01 @Hr24,15/01/07
3: 1.48E-01 @Hr24,25/12/08 6: 1.14E-01 @Hr24,06/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2

At the discrete receptors:

1: 8.99E-02 @Hr24,24/12/08 4: 1.74E-01 @Hr24,08/05/07
2: 4.52E-01 @Hr24,04/02/07 5: 5.79E-01 @Hr24,15/01/07
3: 7.18E-01 @Hr24,25/12/08 6: 5.52E-01 @Hr24,06/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3

At the discrete receptors:

1: 7.67E-02 @Hr24,24/12/08 4: 1.49E-01 @Hr24,08/05/07
2: 3.86E-01 @Hr24,04/02/07 5: 4.93E-01 @Hr24,15/01/07
3: 6.12E-01 @Hr24,25/12/08 6: 4.71E-01 @Hr24,06/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 4.76E-02 @Hr24,24/12/08 4: 9.23E-02 @Hr24,08/05/07
2: 2.39E-01 @Hr24,04/02/07 5: 3.06E-01 @Hr24,15/01/07
3: 3.80E-01 @Hr24,25/12/08 6: 2.92E-01 @Hr24,06/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 2.39E-03 @Hr24,14/01/08 4: 5.90E-03 @Hr24,25/03/08
2: 8.74E-03 @Hr24,25/04/07 5: 1.83E-02 @Hr24,30/12/08
3: 1.64E-02 @Hr24,01/04/07 6: 1.32E-02 @Hr24,14/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.16E-02 @Hr24,14/01/08 4: 2.87E-02 @Hr24,25/03/08
2: 4.24E-02 @Hr24,25/04/07 5: 8.89E-02 @Hr24,30/12/08
3: 7.95E-02 @Hr24,01/04/07 6: 6.43E-02 @Hr24,14/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 9.91E-03 @Hr24,14/01/08 4: 2.45E-02 @Hr24,25/03/08
2: 3.62E-02 @Hr24,25/04/07 5: 7.58E-02 @Hr24,30/12/08
3: 6.78E-02 @Hr24,01/04/07 6: 5.48E-02 @Hr24,14/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4

At the discrete receptors:

1: 6.15E-03 @Hr24,14/01/08 4: 1.52E-02 @Hr24,25/03/08
2: 2.25E-02 @Hr24,25/04/07 5: 4.71E-02 @Hr24,30/12/08
3: 4.21E-02 @Hr24,01/04/07 6: 3.40E-02 @Hr24,14/04/07

Fill material behind northern retaining wall - excavation

1 _____

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_____

Concentration or deposition Concentration
Emission rate units grams/second
Concentration units microgram/m3
Units conversion factor 1.00E+06
Constant background concentration 0.00E+00
Terrain effects Egan method
Smooth stability class changes? No
Other stability class adjustments ("urban modes") None
Ignore building wake effects? No
Decay coefficient (unless overridden by met. file) 0.000
Anemometer height 10 m
Roughness height at the wind vane site 0.300 m

DISPERSION CURVES
Horizontal dispersion curves for sources <100m high Pasquill-Gifford
Vertical dispersion curves for sources <100m high Pasquill-Gifford
Horizontal dispersion curves for sources >100m high Briggs Rural
Vertical dispersion curves for sources >100m high Briggs Rural
Enhance horizontal plume spreads for buoyancy? Yes
Enhance vertical plume spreads for buoyancy? Yes
Adjust horizontal P-G formulae for roughness height? Yes
Adjust vertical P-G formulae for roughness height? Yes
Roughness height 0.800m
Adjustment for wind directional shear None

PLUME RISE OPTIONS
Gradual plume rise? Yes
Stack-tip downwash included? Yes
Building downwash algorithm: PRIME method.
Entrainment coeff. for neutral & stable lapse rates 0.60,0.60
Partial penetration of elevated inversions? No
Disregard temp. gradients in the hourly met. file? No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

_____

_____

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SOURCE GROUPS

_____

Group No.	Members
1	VEX2T
2	VEX2P
3	VEX2BE
4	VEX2BP

40913 Macdonaldtown Retaining Walls - excavation and stockpiling

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: VEX2T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 3.17E-04 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX2P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 1.50E-04 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX2BE

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 4.75E-09 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX2BP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 4.75E-08 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

1

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RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5

3 332259 6247645 21.5 1.5 6 332252 6247669 17.0 1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

HOURLY VARIABLE EMISSION FACTOR INFORMATION

The input emission rates specfied above will be multiplied by hourly varying factors entered via the input file:
C:\Users\sdorairaj\Ausplume\New folder (2)\RandExVar.csv
For each stack source, hourly values within this file will be added to each declared exit velocity (m/sec) and temperature (K).

Title of input hourly emission factor file is:
Variable Emissions,,

HOURLY EMISSION FACTOR SOURCE TYPE ALLOCATION

Prefix V allocated: VEX2T VEX2P VEX2BE VEX2BP

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 8.26E+01 @Hr16,24/02/07 4: 4.07E+01 @Hr16,31/08/08
2: 7.23E+02 @Hr10,08/06/07 5: 2.58E+02 @Hr07,14/09/07
3: 4.75E+02 @Hr16,21/01/07 6: 5.62E+02 @Hr16,19/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 4.00E+01 @Hr16,24/02/07 4: 1.97E+01 @Hr16,31/08/08
2: 3.50E+02 @Hr10,08/06/07 5: 1.25E+02 @Hr07,14/09/07
3: 2.30E+02 @Hr16,21/01/07 6: 2.72E+02 @Hr16,19/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.24E+01 @Hr16,24/02/07 4: 6.11E+00 @Hr16,31/08/08
2: 1.08E+02 @Hr10,08/06/07 5: 3.87E+01 @Hr07,14/09/07
3: 7.12E+01 @Hr16,21/01/07 6: 8.43E+01 @Hr16,19/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.24E+01 @Hr16,24/02/07 4: 6.11E+00 @Hr16,31/08/08
2: 1.08E+02 @Hr10,08/06/07 5: 3.87E+01 @Hr07,14/09/07
3: 7.12E+01 @Hr16,21/01/07 6: 8.43E+01 @Hr16,19/02/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 2.68E+01 @Hr24,13/02/08 4: 7.49E+00 @Hr24,11/06/08
2: 2.77E+02 @Hr24,08/06/07 5: 4.09E+01 @Hr24,14/09/07
3: 7.89E+01 @Hr24,12/01/07 6: 1.52E+02 @Hr24,02/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.30E+01 @Hr24,13/02/08 4: 3.62E+00 @Hr24,11/06/08
2: 1.34E+02 @Hr24,08/06/07 5: 1.98E+01 @Hr24,14/09/07
3: 3.82E+01 @Hr24,12/01/07 6: 7.38E+01 @Hr24,02/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3

At the discrete receptors:

1: 4.02E+00 @Hr24,13/02/08 4: 1.12E+00 @Hr24,11/06/08
2: 4.15E+01 @Hr24,08/06/07 5: 6.13E+00 @Hr24,14/09/07
3: 1.18E+01 @Hr24,12/01/07 6: 2.29E+01 @Hr24,02/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 4.02E+00 @Hr24,13/02/08 4: 1.12E+00 @Hr24,11/06/08
2: 4.15E+01 @Hr24,08/06/07 5: 6.13E+00 @Hr24,14/09/07
3: 1.18E+01 @Hr24,12/01/07 6: 2.29E+01 @Hr24,02/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 3.80E+00 @Hr24,07/01/08 4: 8.25E-01 @Hr24,23/07/08
2: 3.87E+01 @Hr24,07/01/08 5: 8.66E+00 @Hr24,02/04/07
3: 2.09E+01 @Hr24,02/04/07 6: 4.23E+01 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2
At the discrete receptors:

1: 1.84E+00 @Hr24,07/01/08 4: 3.99E-01 @Hr24,23/07/08
2: 1.87E+01 @Hr24,07/01/08 5: 4.19E+00 @Hr24,02/04/07
3: 1.01E+01 @Hr24,02/04/07 6: 2.05E+01 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 5.71E-01 @Hr24,07/01/08 4: 1.24E-01 @Hr24,23/07/08
2: 5.80E+00 @Hr24,07/01/08 5: 1.30E+00 @Hr24,02/04/07
3: 3.13E+00 @Hr24,02/04/07 6: 6.34E+00 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4
At the discrete receptors:

1: 5.71E-01 @Hr24,07/01/08 4: 1.24E-01 @Hr24,23/07/08
2: 5.80E+00 @Hr24,07/01/08 5: 1.30E+00 @Hr24,02/04/07
3: 3.13E+00 @Hr24,02/04/07 6: 6.34E+00 @Hr24,01/04/07

Fill material behind northern retaining wall - fugitive

1

40913 Macdonaldtown northern retaining wall - fugitive

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown northern retaining wall - fugitive

SOURCE GROUPS

Group No.	Members
1	F2T
2	F2P
3	F2BEP F2BPP
4	F2BEV

40913 Macdonaldtown northern retaining wall - fugitive

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: F2T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332283	6247718	18m	10m	10m	0deg	10m	0m

(Constant) emission rate = 7.00E-07 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F2P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332283	6247718	18m	10m	10m	0deg	10m	0m

(Constant) emission rate = 3.50E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F2BEP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 1.10E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F2BPP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332271	6247720	18m	50m	5m	80deg	10m	0m

(Constant) emission rate = 1.10E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F2BEV

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332283	6247718	18m	10m	10m	0deg	10m	0m

(Constant) emission rate = 2.50E-06 grams/second per square metre
No gravitational settling or scavenging.

40913 Macdonaldtown northern retaining wall - fugitive

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5
3	332259	6247645	21.5	1.5	6	332252	6247669	17.0	1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 3.77E-01 @Hr23,01/09/08 4: 2.37E-01 @Hr24,08/12/07
2: 2.97E+00 @Hr02,03/04/07 5: 6.62E-01 @Hr20,12/06/08
3: 8.97E-01 @Hr24,23/01/08 6: 1.29E+00 @Hr01,11/11/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.88E+00 @Hr23,01/09/08 4: 1.19E+00 @Hr24,08/12/07
2: 1.49E+01 @Hr02,03/04/07 5: 3.31E+00 @Hr20,12/06/08
3: 4.48E+00 @Hr24,23/01/08 6: 6.45E+00 @Hr01,11/11/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3

At the discrete receptors:

1: 2.44E+00 @Hr01,22/03/07 4: 2.30E+00 @Hr04,15/02/07
2: 1.61E+01 @Hr19,29/07/07 5: 8.27E+00 @Hr03,31/08/07
3: 9.68E+00 @Hr03,28/05/07 6: 8.30E+00 @Hr18,26/05/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.34E+00 @Hr23,01/09/08 4: 8.48E-01 @Hr24,08/12/07
2: 1.06E+01 @Hr02,03/04/07 5: 2.36E+00 @Hr20,12/06/08
3: 3.20E+00 @Hr24,23/01/08 6: 4.61E+00 @Hr01,11/11/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 2.89E-02 @Hr24,24/12/08 4: 2.87E-02 @Hr24,09/03/08
2: 3.49E-01 @Hr24,04/02/07 5: 1.07E-01 @Hr24,16/03/07
3: 1.62E-01 @Hr24,05/05/07 6: 1.62E-01 @Hr24,04/03/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.45E-01 @Hr24,24/12/08 4: 1.43E-01 @Hr24,09/03/08
2: 1.74E+00 @Hr24,04/02/07 5: 5.36E-01 @Hr24,16/03/07
3: 8.08E-01 @Hr24,05/05/07 6: 8.08E-01 @Hr24,04/03/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.53E-01 @Hr24,11/05/08 4: 3.31E-01 @Hr24,09/03/08
2: 1.43E+00 @Hr24,24/12/08 5: 1.38E+00 @Hr24,16/03/07
3: 2.09E+00 @Hr24,05/05/07 6: 2.38E+00 @Hr24,25/12/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.03E-01 @Hr24,24/12/08 4: 1.02E-01 @Hr24,09/03/08
2: 1.25E+00 @Hr24,04/02/07 5: 3.83E-01 @Hr24,16/03/07
3: 5.77E-01 @Hr24,05/05/07 6: 5.77E-01 @Hr24,04/03/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 4.03E-03 @Hr24,14/01/08 4: 3.69E-03 @Hr24,31/05/08
2: 3.48E-02 @Hr24,25/04/07 5: 1.86E-02 @Hr24,16/05/07
3: 2.56E-02 @Hr24,17/05/07 6: 3.08E-02 @Hr24,04/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2

At the discrete receptors:

1: 2.01E-02 @Hr24,14/01/08 4: 1.84E-02 @Hr24,31/05/08
2: 1.74E-01 @Hr24,25/04/07 5: 9.28E-02 @Hr24,16/05/07
3: 1.28E-01 @Hr24,17/05/07 6: 1.54E-01 @Hr24,04/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 2.59E-02 @Hr24,15/01/08 4: 3.93E-02 @Hr24,28/05/07
2: 2.23E-01 @Hr24,14/01/08 5: 2.56E-01 @Hr24,16/05/07
3: 3.79E-01 @Hr24,17/05/07 6: 4.35E-01 @Hr24,01/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.44E-02 @Hr24,14/01/08 4: 1.32E-02 @Hr24,31/05/08
2: 1.24E-01 @Hr24,25/04/07 5: 6.63E-02 @Hr24,16/05/07
3: 9.16E-02 @Hr24,17/05/07 6: 1.10E-01 @Hr24,04/04/07

Fill material within northern gasholder - excavation

1

40913 Macdonaldtown Northern Gasholder Excavation

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown Northern Gasholder Excavation

SOURCE GROUPS

Group No.	Members
1	VEX3T
2	VEX3P
3	VEX3BE
4	VEX3BP

40913 Macdonaldtown Northern Gasholder Excavation

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: VEX3T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332276	6247697	18m	20m	20m	0deg	5m	0m

(Constant) emission rate = 2.54E-06 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX3P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332276	6247697	18m	20m	20m	0deg	5m	0m

(Constant) emission rate = 1.20E-06 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX3BE

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332276	6247697	18m	20m	20m	0deg	5m	0m

(Constant) emission rate = 3.81E-11 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX3BP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332276	6247697	18m	20m	20m	0deg	5m	0m

(Constant) emission rate = 3.81E-10 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

1

40913 Macdonaldtown Northern Gasholder Excavation

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5

3 332259 6247645 21.5 1.5 6 332252 6247669 17.0 1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

HOURLY VARIABLE EMISSION FACTOR INFORMATION

The input emission rates specfied above will be multiplied by hourly varying factors entered via the input file:
C:\Users\sdorairaj\Ausplume\New folder (2)\RandExVar.csv
For each stack source, hourly values within this file will be added to each declared exit velocity (m/sec) and temperature (K).

Title of input hourly emission factor file is:
Variable Emissions,,

HOURLY EMISSION FACTOR SOURCE TYPE ALLOCATION

Prefix V allocated: VEX3T VEX3P VEX3BE VEX3BP

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 1.11E+00 @Hr15,27/01/07 4: 5.19E-01 @Hr16,31/08/08
2: 9.93E+00 @Hr16,08/06/07 5: 2.44E+00 @Hr16,21/01/07
3: 4.17E+00 @Hr16,21/01/07 6: 6.58E+00 @Hr15,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 5.34E-01 @Hr15,27/01/07 4: 2.49E-01 @Hr16,31/08/08
2: 4.77E+00 @Hr16,08/06/07 5: 1.17E+00 @Hr16,21/01/07
3: 2.00E+00 @Hr16,21/01/07 6: 3.16E+00 @Hr15,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3

At the discrete receptors:

1: 1.69E+00 @Hr15,27/01/07 4: 7.89E-01 @Hr16,31/08/08
2: 1.51E+01 @Hr16,08/06/07 5: 3.71E+00 @Hr16,21/01/07
3: 6.34E+00 @Hr16,21/01/07 6: 1.00E+01 @Hr15,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.69E+00 @Hr15,27/01/07 4: 7.89E-01 @Hr16,31/08/08
2: 1.51E+01 @Hr16,08/06/07 5: 3.71E+00 @Hr16,21/01/07
3: 6.34E+00 @Hr16,21/01/07 6: 1.00E+01 @Hr15,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1

At the discrete receptors:

1: 3.61E-01 @Hr24,08/06/07 4: 9.47E-02 @Hr24,11/06/08
2: 4.01E+00 @Hr24,08/06/07 5: 3.72E-01 @Hr24,14/09/07
3: 6.29E-01 @Hr24,17/01/07 6: 1.19E+00 @Hr24,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2

At the discrete receptors:

1: 1.73E-01 @Hr24,08/06/07 4: 4.55E-02 @Hr24,11/06/08
2: 1.92E+00 @Hr24,08/06/07 5: 1.79E-01 @Hr24,14/09/07
3: 3.02E-01 @Hr24,17/01/07 6: 5.70E-01 @Hr24,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3
At the discrete receptors:

1: 5.49E-01 @Hr24,08/06/07 4: 1.44E-01 @Hr24,11/06/08
2: 6.09E+00 @Hr24,08/06/07 5: 5.65E-01 @Hr24,14/09/07
3: 9.56E-01 @Hr24,17/01/07 6: 1.80E+00 @Hr24,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 5.49E-01 @Hr24,08/06/07 4: 1.44E-01 @Hr24,11/06/08
2: 6.09E+00 @Hr24,08/06/07 5: 5.65E-01 @Hr24,14/09/07
3: 9.56E-01 @Hr24,17/01/07 6: 1.80E+00 @Hr24,12/01/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 5.29E-02 @Hr24,07/01/08 4: 8.98E-03 @Hr24,23/07/08
2: 4.68E-01 @Hr24,21/01/08 5: 8.14E-02 @Hr24,02/04/07
3: 1.60E-01 @Hr24,02/04/07 6: 3.36E-01 @Hr24,02/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2

At the discrete receptors:

1: 2.54E-02 @Hr24,07/01/08 4: 4.31E-03 @Hr24,23/07/08
2: 2.24E-01 @Hr24,21/01/08 5: 3.91E-02 @Hr24,02/04/07
3: 7.69E-02 @Hr24,02/04/07 6: 1.61E-01 @Hr24,02/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 8.04E-02 @Hr24,07/01/08 4: 1.37E-02 @Hr24,23/07/08
2: 7.11E-01 @Hr24,21/01/08 5: 1.24E-01 @Hr24,02/04/07
3: 2.43E-01 @Hr24,02/04/07 6: 5.11E-01 @Hr24,02/04/07

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4

At the discrete receptors:

1: 8.04E-02 @Hr24,07/01/08 4: 1.37E-02 @Hr24,23/07/08
2: 7.11E-01 @Hr24,21/01/08 5: 1.24E-01 @Hr24,02/04/07
3: 2.43E-01 @Hr24,02/04/07 6: 5.11E-01 @Hr24,02/04/07

Fill material within northern gasholder -fugitive

1

40913 Macdonaldtown Northern Gasholder Excavation - Fugitive

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown Northern Gasholder Excavation

SOURCE GROUPS

Group No.	Members
1	F3T
2	F3P
3	F3BEP F3BEV
4	F3BPP

1

40913 Macdonaldtown Northern Gasholder Excavation - Fugitive

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: F3T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247702	18m	10m	10m	0deg	5m	0m

(Constant) emission rate = 2.70E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F3P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247702	18m	10m	10m	0deg	5m	0m

(Constant) emission rate = 1.40E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F3BEP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247702	18m	10m	10m	0deg	5m	0m

(Constant) emission rate = 4.10E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F3BEV

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247702	18m	10m	10m	0deg	5m	0m

(Constant) emission rate = 9.70E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: F3BPP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247702	18m	10m	10m	0deg	5m	0m

(Constant) emission rate = 4.10E-06 grams/second per square metre
No gravitational settling or scavenging.

1

40913 Macdonaldtown Northern Gasholder Excavation

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
6247493.m 6247550.m 6247604.m 6247660.m 6247712.m 6247768.m 6247822.m
6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
1	332244	6247859	26.0	1.5	4	332342	6247537	16.0	1.5
2	332263	6247744	20.0	1.5	5	332265	6247624	16.0	1.5
3	332259	6247645	21.5	1.5	6	332252	6247669	17.0	1.5

METEOROLOGICAL DATA : DECCW Randwick AWS Data BoM SydneyAP Clouds SydneyAP

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 1

At the discrete receptors:

1: 1.21E+00 @Hr19,29/07/07 4: 1.08E+00 @Hr01,16/05/07
2: 6.56E+00 @Hr20,13/03/07 5: 3.05E+00 @Hr02,15/03/07
3: 4.05E+00 @Hr01,11/11/07 6: 5.31E+00 @Hr20,13/01/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 2

At the discrete receptors:

1: 6.30E-01 @Hr19,29/07/07 4: 5.59E-01 @Hr01,16/05/07
2: 3.40E+00 @Hr20,13/03/07 5: 1.58E+00 @Hr02,15/03/07
3: 2.10E+00 @Hr01,11/11/07 6: 2.75E+00 @Hr20,13/01/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 3
At the discrete receptors:

1: 6.21E+00 @Hr19,29/07/07 4: 5.51E+00 @Hr01,16/05/07
2: 3.35E+01 @Hr20,13/03/07 5: 1.56E+01 @Hr02,15/03/07
3: 2.07E+01 @Hr01,11/11/07 6: 2.71E+01 @Hr20,13/01/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 1 HOUR; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.84E+00 @Hr19,29/07/07 4: 1.64E+00 @Hr01,16/05/07
2: 9.95E+00 @Hr20,13/03/07 5: 4.63E+00 @Hr02,15/03/07
3: 6.15E+00 @Hr01,11/11/07 6: 8.07E+00 @Hr20,13/01/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 1
At the discrete receptors:

1: 9.36E-02 @Hr24,24/12/08 4: 1.18E-01 @Hr24,15/03/08
2: 7.23E-01 @Hr24,04/02/07 5: 5.32E-01 @Hr24,05/05/07
3: 5.09E-01 @Hr24,04/03/08 6: 8.11E-01 @Hr24,25/12/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 2
At the discrete receptors:

1: 4.85E-02 @Hr24,24/12/08 4: 6.10E-02 @Hr24,15/03/08
2: 3.75E-01 @Hr24,04/02/07 5: 2.76E-01 @Hr24,05/05/07
3: 2.64E-01 @Hr24,04/03/08 6: 4.21E-01 @Hr24,25/12/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 3
At the discrete receptors:

1: 4.78E-01 @Hr24,24/12/08 4: 6.01E-01 @Hr24,15/03/08
2: 3.69E+00 @Hr24,04/02/07 5: 2.72E+00 @Hr24,05/05/07
3: 2.60E+00 @Hr24,04/03/08 6: 4.15E+00 @Hr24,25/12/08

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
AVERAGING TIME = 24 HOURS; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.42E-01 @Hr24,24/12/08 4: 1.79E-01 @Hr24,15/03/08
2: 1.10E+00 @Hr24,04/02/07 5: 8.08E-01 @Hr24,05/05/07
3: 7.73E-01 @Hr24,04/03/08 6: 1.23E+00 @Hr24,25/12/08

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 1

At the discrete receptors:

1: 1.24E-02 @Hr24,14/01/08 4: 1.69E-02 @Hr24,31/05/08
2: 6.92E-02 @Hr24,25/04/07 5: 8.18E-02 @Hr24,17/05/07
3: 9.36E-02 @Hr24,30/12/08 6: 9.46E-02 @Hr24,30/12/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 2

At the discrete receptors:

1: 6.41E-03 @Hr24,14/01/08 4: 8.76E-03 @Hr24,31/05/08
2: 3.59E-02 @Hr24,25/04/07 5: 4.24E-02 @Hr24,17/05/07
3: 4.85E-02 @Hr24,30/12/08 6: 4.90E-02 @Hr24,30/12/08

---

1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 3

At the discrete receptors:

1: 6.32E-02 @Hr24,14/01/08 4: 8.64E-02 @Hr24,31/05/08
2: 3.54E-01 @Hr24,25/04/07 5: 4.18E-01 @Hr24,17/05/07
3: 4.78E-01 @Hr24,30/12/08 6: 4.83E-01 @Hr24,30/12/08

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1 HIGHEST RECORDINGS FOR EACH RECEPTOR (in microgram/m3)
90-DAY RUNNING AVERAGES; SOURCE GROUP No. 4

At the discrete receptors:

1: 1.88E-02 @Hr24,14/01/08 4: 2.57E-02 @Hr24,31/05/08
2: 1.05E-01 @Hr24,25/04/07 5: 1.24E-01 @Hr24,17/05/07
3: 1.42E-01 @Hr24,30/12/08 6: 1.44E-01 @Hr24,30/12/08

Fill material within former gasworks areas - excavation

40913 Macdonaldtown Former Gasworks Excavation

Concentration or deposition	Concentration
Emission rate units	grams/second
Concentration units	microgram/m3
Units conversion factor	1.00E+06
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.300 m

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Pasquill-Gifford
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.800m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients
given by the hourly met. file, a value from the following table
(in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
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3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035
6	0.000	0.000	0.000	0.000	0.020	0.035

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
1 hour
24 hours
90 days

40913 Macdonaldtown Former Gasworks Excavation

SOURCE GROUPS

Group No.	Members
1	VEX4T
2	VEX4P
3	VEX4BE
4	VEX4BP

40913 Macdonaldtown Former Gasworks Excavation

SOURCE CHARACTERISTICS

INTEGRATED AREA SOURCE: VEX4T

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247695	18m	15m	15m	0deg	5m	0m

(Constant) emission rate = 99.02E-06 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX4P

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247695	18m	15m	15m	0deg	5m	0m

(Constant) emission rate = 4.27E-06 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX4BE

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247695	18m	15m	15m	0deg	5m	0m

(Constant) emission rate = 1.82E-10 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: VEX4BP

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
332296	6247695	18m	15m	15m	0deg	5m	0m

(Constant) emission rate = 4.01E-09 grams/second per square metre

Hourly multiplicative factors will be used with
this emission factor.
No gravitational settling or scavenging.

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RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):
332119.m 332162.m 332202.m 332243.m 332285.m 332326.m 332370.m
332411.m 332452.m 332493.m 332533.m

and these y-values (or northings):
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6247875.m 6247926.m 6247977.m 6248028.m

DISCRETE RECEPTOR LOCATIONS (in metres)

No.	X	Y	ELEVN	HEIGHT	No.	X	Y	ELEVN	HEIGHT
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