



## November 2016 Air Quality Summary Report

### Barangaroo South – Remediation Works

**Licence Number:** 13336

**Licensee:** Barangaroo Delivery Authority

**Licensee Address:** Level 21, 201 Kent Street, Sydney

**Sampling period:** 1-30 November 2016

**Date provided to Licensee:** 20 December 2016

**Date published:** 20 December 2016

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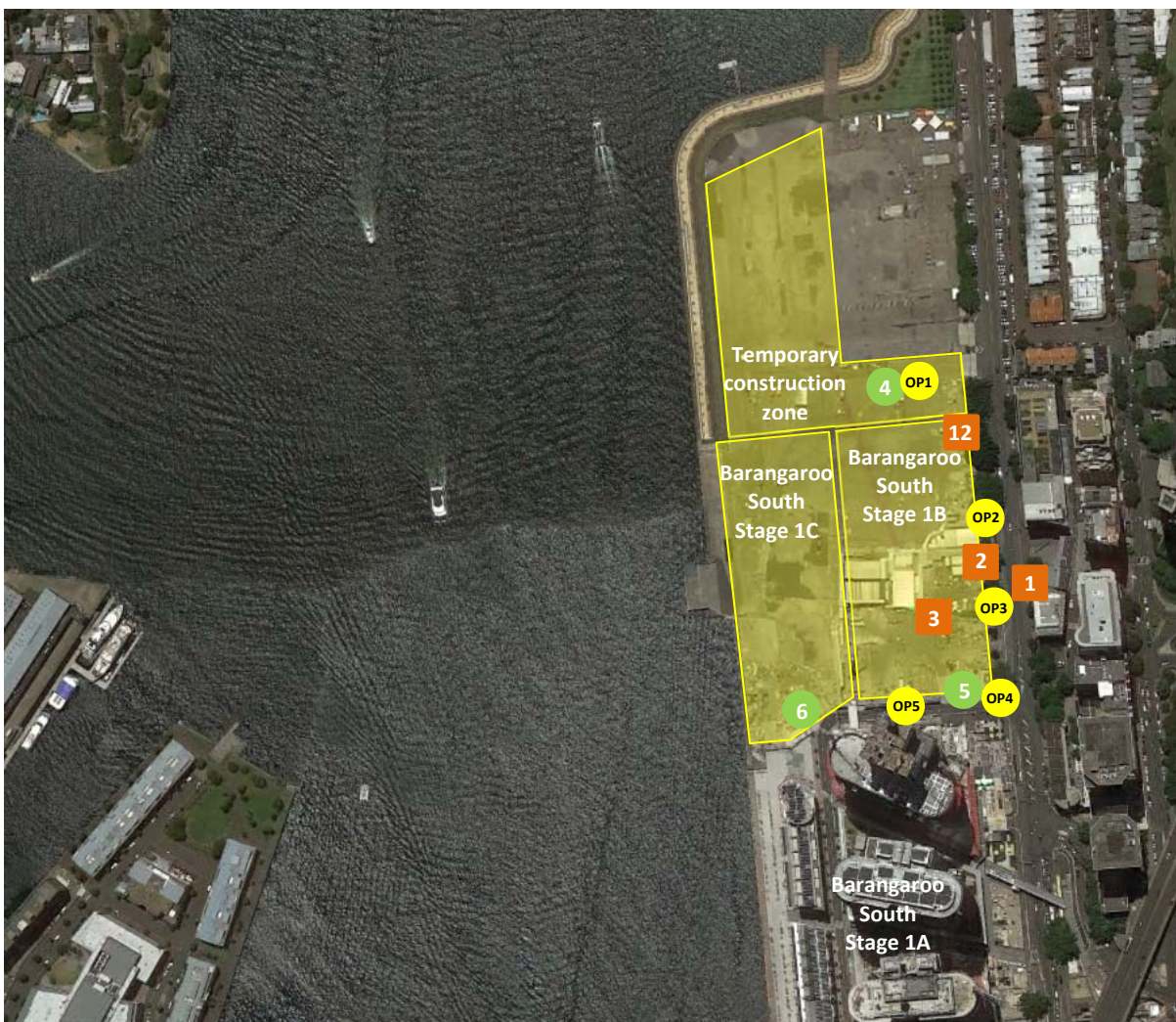
This report has been compiled to summarise results of air quality monitoring at Barangaroo South in November 2016 in accordance with [EPL number 13336](#). This data is for samples taken from 1 to 30 November 2016. The data was provided to the Barangaroo Delivery Authority (the Licencee) on 20 December 2016.

Lend Lease conducts continuous air quality monitoring at Barangaroo South to measure air quality and assist the construction team implement appropriate environmental controls on site.

Air quality monitoring is carried out in accordance with all relevant authority and statutory requirements. Monitoring parameters include particulate matter less than 10 microns (PM10), total solid particles (TSP), metals, polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs).




## Air quality monitoring locations

Air quality monitoring locations are located as shown below:



*Approximate location of air monitoring equipment*

### Legend

-  Ambient Air Quality Monitoring – EPL Point
-  Ambient Odour Monitoring Point
-  Enclosure Discharge Point – EPL Point



## Monitoring results – ISCO Remediation Trial

During November 2016 remediation trial activities were undertaken in accordance with relevant management plans with specific controls implemented during this reporting period which included:

- Deodorising and foaming unit to suppress odours
- Sealed vacuum unit with granular activated carbon filters
- Operation of Multi-phase extraction (MPE) units and the Soil Vapour Extraction (SVE) units to control vapours
- Sealed liquid extraction units

### Volatile Organic Compounds (VOCs) – Hickson Road Trial discharge

Monitoring Parameter	EPL Point 1 1 hour average (mg/m <sup>3</sup> )
Average (mg/m <sup>3</sup> )	2.82
Minimum (mg/m <sup>3</sup> )	1.88
Maximum (mg/m <sup>3</sup> )	6.26
<b>Limit</b>	<b>10 mg/m<sup>3</sup></b>

### Frequency

Parameter	Frequency	EPL Point 1
VOCs as n-propane equivalent	Monitoring frequency required by licence	Continuous
	No. of samples required by licence	
	No. of samples collected & analysed	

## Monitoring results – Perimeter Retention Wall works

During November 2016 construction of the perimeter retention wall was undertaken in accordance with relevant management plans with specific controls implemented during this reporting period which included:

- Negative pressure excavation enclosures
- Granulated Activated Carbon filter system
- Emissions Control System

### Volatile Organic Compounds (VOCs) – Perimeter Retention Wall

Monitoring Parameter	EPL Point 2 (mg/m <sup>3</sup> )	EPL Point 3 1 hour average (mg/m <sup>3</sup> )	EPL Point 12 1 hour average (mg/m <sup>3</sup> )
Average (mg/m <sup>3</sup> )	0.00	0.05	0.04
Minimum (mg/m <sup>3</sup> )	0.00	0.00	0.00
Maximum (mg/m <sup>3</sup> )	0.00	2.72	0.25
<b>Limit</b>	<b>10 mg/m<sup>3</sup></b>	<b>5 mg/m<sup>3</sup></b>	<b>10 mg/m<sup>3</sup></b>

### Frequency

Parameter	Frequency	EPL Point 2	EPL Point 3
VOCs as n-propane equivalent	Monitoring frequency required by licence	Daily (during work)	Continuous
	No. of samples required by licence	26	
	No. of samples collected & analysed	26	



## Monitoring results – Ambient air quality

Monitoring at ambient locations around the construction site was undertaken as per the EPL 13336.

These locations correspond to the following licenced monitoring locations, as shown in the figure above:

- Northern: EPL Point 4
- Eastern: EPL Point 5
- Southern: EPL Point 6

### PM10

Monitoring Parameter	EPL Point 4 ( $\mu\text{g}/\text{m}^3$ )	EPL Point 5 ( $\mu\text{g}/\text{m}^3$ )	EPL Point 6 ( $\mu\text{g}/\text{m}^3$ )
Average	27.5	6.7	6.4
Minimum (24hr)	13.8	2.5	2.7
Maximum (24hr)	43.3	23.5	12.2

### Volatile Organic Compounds (VOCs) – Ambient

Monitoring Parameter	EPL Point 4 (ppm)	EPL Point 5 (ppm)	EPL Point 6 (ppm)
Average	<0.1	<0.1	<0.1
Minimum (24hr)	<0.1	<0.1	<0.1
Maximum (24hr)	<0.1	<0.1	<0.1

### Total Solid Particles (TSP)

Monitoring Parameter	EPL Point 4 - TSP ( $\mu\text{g}/\text{m}^3$ )	EPL Point 6 - TSP ( $\mu\text{g}/\text{m}^3$ )
3/11/2016	31.67	26.23
9/11/2016	87.61	57.33
15/11/2016	67.15	34.68
21/11/2016	45.77	35.59
27/11/2016	55.31	60.92
Rolling annual average	57.06	43.78
Annual average criteria	90	90

### PAHs

Monitoring Parameter	EPL Point 4 ( $\text{ng}/\text{m}^3$ )		EPL Point 6 ( $\text{ng}/\text{m}^3$ )	
	Total PAH	Benzo(a) pyrene	Total PAH	Benzo(a) pyrene
3/11/2016	<3	<2	<3	<2
9/11/2016	<3	<2	<3	<2
15/11/2016	<3	<2	<3	<2
21/11/2016	<3	<2	<3	<2
27/11/2016	<3	<2	<3	<2
1 Hour Average Criteria (indicative purposes) (PAHs as BaP) ( $\text{ng}/\text{m}^3$ )	400			



## Metals

Date	Location	Concentration (ng/m <sup>3</sup> )												
		Sb	As	Cd	Pb	Hg	Be	Cr	Co	Mn	Ni	Se	Sn	V
3/11/2016	EPL Point 4	<13	<5.2	<1.3	10	<0.5	<2.6	4.5	<1.3	27	4.1	<13	5.7	6
	EPL Point 6	<13	<5.2	<1.3	9	<0.5	<2.6	6.6	<1.3	33	5.5	<13	<5.2	6.7
9/11/2016	EPL Point 4	<13	<5.2	<1.3	6	<0.5	<2.6	4.3	<1.3	33	3.5	<13	<5.2	5.2
	EPL Point 6	<13	<5.2	<1.3	4	<0.5	<2.6	10	<1.3	18	5.6	<13	<5.2	4.5
15/11/2016	EPL Point 4	<13	<5.2	<1.3	8.8	<0.5	<2.6	4.6	<1.3	40	2.7	<13	<5.2	4.5
	EPL Point 6	<13	<5.2	<1.3	6.3	<0.5	<2.6	6.3	<1.3	22	3.5	<13	<5.2	2.8
21/11/2016	EPL Point 4	<13	<5.2	<1.3	10	<0.5	<2.6	4.8	<1.3	20	3.7	<13	<5.2	7.4
	EPL Point 6	<13	<5.2	<1.3	5.7	<0.5	<2.6	6.1	<1.3	32	4.5	<13	<5.2	7.3
27/11/2016	EPL Point 4	<13	<5.2	<1.3	3.8	<0.5	<2.6	11	<1.3	12	4.8	<13	<5.2	<2.6
	EPL Point 6	<13	<5.2	<1.3	3.2	<0.5	<2.6	16	<1.3	20	6	<13	<5.2	<2.6
EPL Point 4 Annual Average		-	-	-	34.0	-	-	-	-	-	-	-	-	-
EPL Point 6 Annual Average		-	-	-	32.4	-	-	-	-	-	-	-	-	-
1 Hour Average Criteria (indicative purposes)		9	90	18	-	180	4	90	-	18000	180	-	-	-
No. of 1 hr Exceedances		0	0	0	0	0	0	0	N/A	0	0	N/A	N/A	N/A
Annual Average Criteria					500									

## Frequencies – Ambient Monitoring

Parameter	Frequency	EPL Point 4	EPL Point 5	EPL Point 6
TSP, PAHs, metallic compounds	Monitoring frequency required by licence	24 Hours every 6 days		
	No. of samples required by licence	5	N/A	5
	No. of samples collected & analysed	5	N/A	5
VOCs	Monitoring frequency required by licence	Daily (during work)		
	No. of samples required by licence	26	26	26
	No. of samples collected & analysed	26	26	26
PM10	Monitoring frequency required by licence	Continuous		
	No. of samples required by licence			
	No. of samples collected & analysed			