October 2018 Air Quality Summary Report

Barangaroo South – Remediation Works & Crown Sydney Hotel Resort

Licence Number: 13336

Licensee: Barangaroo Delivery Authority

Licensee Address: Level 27, 201 Kent Street, Sydney

Sampling period: 1-31 October 2018

Date provided to Licensee: 20 November 2018

Date published: 20 November 2018

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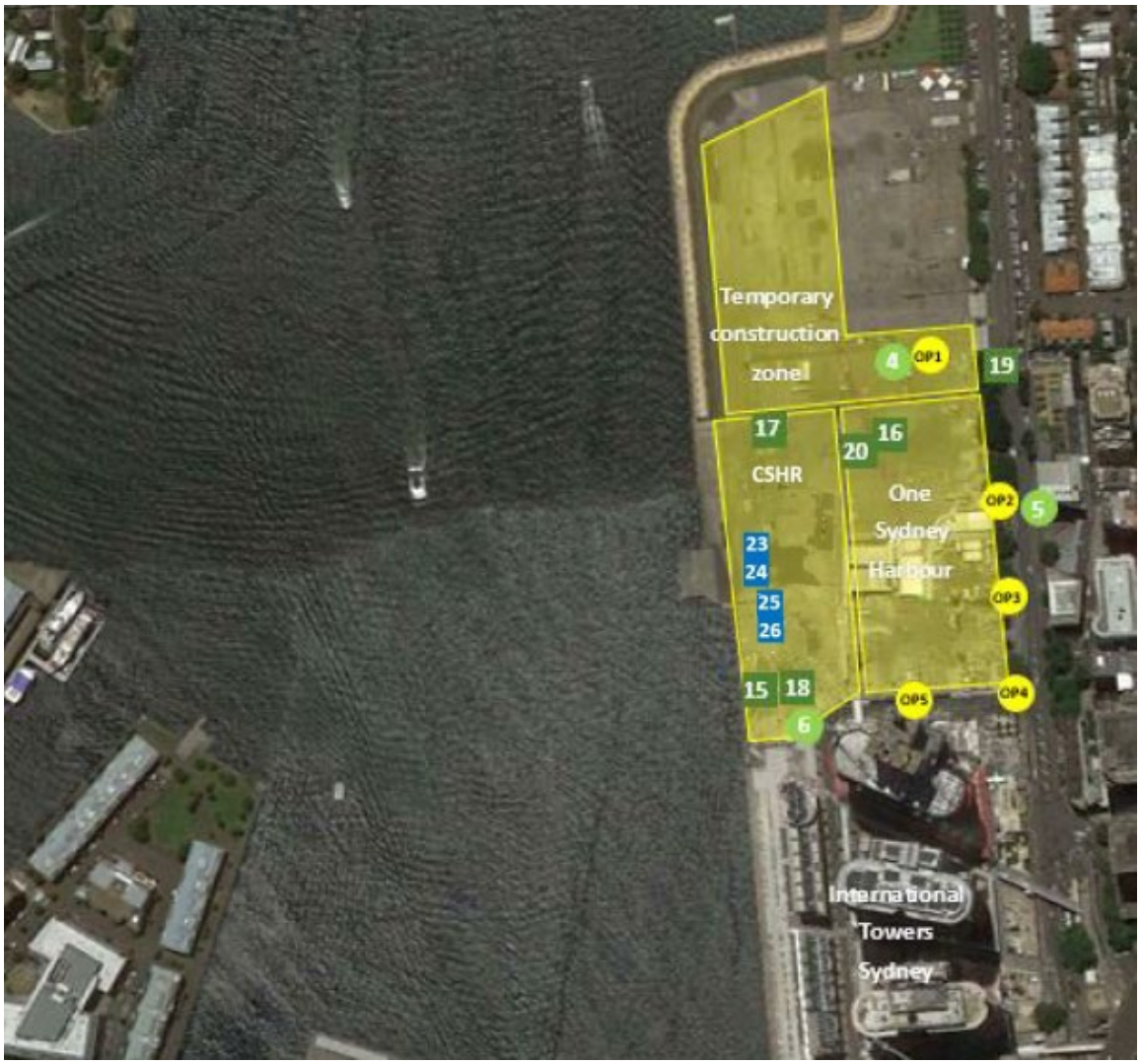
This report has been compiled to summarise results of air quality monitoring at Barangaroo South in October 2018 in accordance with EPL number 13336. This data is for samples taken from 1 to 31 October 2018. The data was provided to the Barangaroo Delivery Authority (the Licencee) on 20 November 2018.

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

- X — Ambient Air Quality Monitoring – EPL Point
- OP — Ambient Odour Monitoring Point
- X — Enclosure Discharge Point – EPL Point

Environment Protection Licence number: 13336
Licencee: Barangaroo Delivery Authority, Level 27, AON/Maritime Trade Towers, 201 Kent Street, Sydney, 2000
These results have been made available in accordance with Environment Protection Authority requirements for publishing pollution monitoring data

Hickson Road Remediation VOCs

The Hickson Road remediation works have commenced. The Hickson Road remediation includes the use of an Odour Control Enclosure (OCE) and Emissions Control System (ECS) to manage the air quality associated with the works. The air from within the OCE is captured and treated, using granular activated carbon (GAC) before the treated air is discharged in accordance with the premises EPL No. 13336 from EPL Point 19. VOC (as n-propane equivalent) is measured on a continuous basis using a Flame Ionising Detector (FID). The VOC data for this month has been summarised below. It should be noted that EPL point 19 ceased operation on 15 October.

Monitoring results – Block 4 & 5 Remediation

The Block 4 & 5 remediation works have commenced. Like the Hickson Road remediation, the Block 4 & 5 includes the use of an OCE and ECS. The air from within the OCE is captured and treated using GAC before the being discharged in accordance with the premises EPL No. 13336 from EPL Point 20. VOC (as n-propane equivalent) is measured on a continuous basis using a Photoionisation Detection Unit (PID). The VOC data for this month has been summarised below.

Monitoring results – Main Water Treatment Plant

During October 2018, the Water Storage Balance Tanks (WSBTs) fed untreated surface and groundwater water from the OSH remediation works to the Main Water Treatment Plant (MWTP) for treatment. The water was treated and discharged in accordance with the premises EPL No. 13336. The air from the WSBTs and the MWTP is cleaned through filter media and discharged via vents. These vents are monitored in accordance with EPL requirements. During October, there were three air discharges points (EPL Point 16, 17, & 20) that were monitored in accordance with the EPL (continuously during operation).

There were no exceedances of the VOC data associated with the WSBTs (EPL Point 17), the MWTP (EPL Point 16), the Block 4 & 5 remediation (EPL Point 20) or the Hickson Road remediation (EPL Point 19).

Crown Sydney Hotel Resort

Crown Sydney Hotel Resort involves the top-down construction of the building. This entails the excavation of the basement beneath the ground floor slab, whilst the tower and podium are being constructed. In October 2018, the stage 3 basement excavation was being undertaken, this is from Basement Level 1 to Basement Level 3. Two ECS (north and south) are utilised to manage the air discharge, with each ECS splitting into two exhaust flues. VOC (as n-propane equivalent) is measured on a continuous basis, at each discharge, using a PID. The VOC data for the month is summarised below, as EPL Points 23, 24, 25 and 26, with no exceedances of the discharge criteria.

Volatile Organic Compounds (VOCs)

Monitoring Parameter	EPL Point 16 1-hour average	EPL Point 17 1-hour average	EPL Point 19 1-hour average	EPL Point 20 1-hour average	EPL Point 23 1-hour average	EPL Point 24 1-hour average	EPL Point 25 1-hour average	EPL Point 26 1-hour average
Average (mg/m^3)	0.15	0.00	0.64	0.03	0.06	0.06	0.20	0.08
Minimum (mg/m^3)	0.01	0.00	0.47	0.00	0.00	0.00	0.00	0.00
Maximum (mg/m^3)	0.45	0.10	1.42	0.85	0.93	0.93	4.10	0.80
Limit (mg/m3)	**10**	**10**	**10**	**5**	**10**	**10**	**10**	**10**

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 (µg/m^3)	EPL Point 5 (µg/m^3)	EPL Point 6 (µg/m^3)
Average	23.3	5.6	6.1
Minimum (24hr)	8.7	2.0	1.4
Maximum (24hr)	42.7	9.4	10.4

Volatile Organic Compounds (VOCs) – Ambient

Monitoring Parameter	EPL Point 4 (ppm)	EPL Point 5 (ppm)	EPL Point 6 (ppm)
Average	0	0	0
Minimum (24hr)	0	0	0
Maximum (24hr)	0	0	0

Total Solid Particles (TSP)

Monitoring Parameter	EPL Point 4 - TSP (µg/m3)	EPL Point 6 - TSP (µg/m3)
06/10/2018	47.39	51.86
12/10/2018	56.47	46.23
18/10/2018	90.14	124.78
24/10/2018	195.96	193.97
30/10/2018	130.60	129.59
Annual average criteria	90	90

PAHs

Monitoring Parameter	EPL Point 4 (ng/m^3)		EPL Point 6 (ng/m^3)	
	Total PAH	Benzo(a) pyrene	Total PAH	Benzo(a) pyrene
06/09/2018	<3	<2	<3	<2
12/09/2018	<3	<2	<3	<2
18/09/2018	<3	<2	<3	<2
24/09/2018	<3	<2	<3	<2
30/09/2018	<3	<2	<3	<2
1 Hour Average Criteria (indicative purposes) (PAHs as BaP) (ng/m^3)	400			

Metals

Date	Location	Concentration (ng/m³)											
		As	Cd	Cr	Pb	Ni	Be	Co	Mn	V	Sb	Hg	Se	Sn
06/09/2018	EPL Point 4	<5.2	<1.3	1.6	<2.6	<2.6	<2.6	<1.3	4.2	<2.6	<13	<5.2	<13	<5.2
	EPL Point 6	<5.2	<1.3	2.4	2.6	<2.6	<2.6	<1.3	5.9	<2.6	<13	<5.2	<13	<5.2
12/09/2018	EPL Point 4	<5.2	<1.3	2.0	<2.6	<2.6	<2.6	<1.3	7.2	<2.6	<13	<5.2	<13	<5.2
	EPL Point 6	<5.2	<1.3	1.8	<2.6	<2.6	<2.6	<1.3	4.9	<2.6	<13	<5.2	<13	<5.2
17/09/2018	EPL Point 4	<5.2	<1.3	2.8	3.7	<2.6	<2.6	<1.3	13	<2.6	<13	<5.2	<13	5.4
	EPL Point 6	<5.2	<1.3	49	3.8	3.9	<2.6	<1.3	31	13	<13	<5.2	<13	5.5
24/09/2018	EPL Point 4	<5.2	<1.3	17	3.4	<2.6	<2.6	<1.3	22	4.3	<13	<5.2	<13	6.5
	EPL Point 6	<5.2	<1.3	3.7	4.7	<2.6	<2.6	<1.3	27	4.1	<13	<5.2	<13	<5.2
30/09/2018	EPL Point 4	<5.2	<1.3	3.2	4.6	<2.6	<2.6	<1.3	19	2.8	<13	<5.2	<13	<5.2
	EPL Point 6	<5.2	<1.3	12	3.2	<2.6	<2.6	<1.3	36	3.2	<13	<5.2	<13	<5.2
EPL Point 4 Annual Average		-	-	-	5.51	-	-	-	-	-	-	-	-	-
EPL Point 6 Annual Average		-	-	-	4.88	-	-	-	-	-	-	-	-	-
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	6	N/A	6
	No. of samples collected & analysed	6	N/A	6
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			