

November 2013 Water Quality Summary Report

Licence Number: 13336

Licensee: Barangaroo Delivery Authority

Licensee Address: Lvl 21, 201 Kent Street, Sydney

Sampling period: 1-30 November 2013

Date provided to Licensee: 20 December 2013

Date published: 03 January 2013

November 2013 Water Quality Summary Report

Barangaroo South

This report has been compiled to summarise results of water quality monitoring at Barangaroo South during November 2013 in accordance with [EPL number 13336](#). This data is for samples taken from 1 to 30 November 2013. The data was provided to the Barangaroo Delivery Authority (the Licencee) on 20 December 2013.

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

Water quality monitoring is carried out in accordance with all relevant authority and statutory requirements. Ambient monitoring in Darling Harbour measures conductivity, pH, temperature and turbidity. The water treatment plant discharge point is monitored for a variety of water quality parameters, and volume.

Location of water quality monitors

Ambient water quality monitoring devices are positioned at three locations within Darling Harbour as shown below. The location of the water treatment plant discharge point is adjacent to the Nearfield 1 location.



Approximate locations of water monitoring equipment

These locations correspond to the following licenced monitoring locations:

| | |
|--------------------------|-------------|
| Water Discharge Point 1: | EPL Point 1 |
| Nearfield 1: | EPL Point 2 |
| Nearfield 2: | EPL Point 3 |
| Background: | EPL Point 4 |

Monitoring results

During November 2013, there were no exceedances of water quality criteria for ambient monitoring in Darling Harbour or monitoring of WTP discharge.

Water Discharge Point 1 – EPL Point 1

| Pollutant | Units of measure | Monitoring frequency required by licence | Limit | Min. Value | Max. Value | Exceedence (yes/no) | No. of Samples: | |
|------------------------|------------------|--|-----------|------------|------------|---------------------|-----------------|-----------|
| | | | | | | | Required | Completed |
| Volume | kL | Daily | 7776 | 147 | 2330 | No | 31 | 31 |
| Ammonia(N) | µg/L | Varies* | 910 | 170 | 710 | No | 4 | 4 |
| Conductivity | uS/cm | Varies* | N/A | 7500 | 31000 | N/A | 4 | 4 |
| Cyanide (total) | µg/L | Varies* | 4 | ND | ND | No | 4 | 4 |
| Dissolved Oxygen | mg/L | Varies* | N/A | 4.6 | 7.3 | N/A | 4 | 4 |
| Oil & Grease | mg/L | Varies* | 10 | ND | 5 | No | 4 | 4 |
| pH | pH | Varies* | 6.5 - 8.5 | 6.8 | 7.7 | No | 4 | 4 |
| Sulphate (S) | mg/L | Varies* | N/A | 100 | 2400 | N/A | 4 | 4 |
| Suspended Solids | mg/L | Varies* | 50 | 6.5 | 24 | No | 4 | 4 |
| Turbidity (NTU) | NTU | Varies* | N/A | 0.4 | 6.1 | N/A | 4 | 4 |
| Benzene | µg/L | Varies* | 500 | ND | 2 | No | 4 | 4 |
| Toluene | µg/L | Varies* | 180 | ND | ND | No | 4 | 4 |
| Ethylbenzene | µg/L | Varies* | 80 | ND | ND | No | 4 | 4 |
| Total m+p-Xylenes | µg/L | Varies* | 75 | ND | ND | No | 4 | 4 |
| o-Xylene | µg/L | Varies* | 350 | ND | 1 | No | 4 | 4 |
| Arsenic (filtered) | µg/L | Varies* | 2.3 | ND | 0.6 | No | 4 | 4 |
| Cadmium (filtered) | µg/L | Varies* | 0.7 | ND | 0.2 | No | 4 | 4 |
| Copper (filtered) | µg/L | Varies* | 1.3 | ND | ND | No | 4 | 4 |
| Lead (filtered) | µg/L | Varies* | 4.4 | ND | ND | No | 4 | 4 |
| Mercury (filtered) | µg/L | Varies* | 0.1 | ND | ND | No | 4 | 4 |
| Nickel (filtered) | µg/L | Varies* | 7 | ND | ND | No | 4 | 4 |
| Zinc (filtered) | µg/L | Varies* | 15 | ND | 7 | No | 4 | 4 |
| Chromium (hexavalent) | µg/L | Varies* | 27 | ND | 1 | No | 4 | 4 |
| Chromium (trivalent) | µg/L | Varies* | 4.4 | ND | ND | No | 4 | 4 |
| Acenaphthene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Acenaphthylene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Anthracene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Benz(a)anthracene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Benzo(a)pyrene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Benzo(b)fluoranthene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Benzo(g,h,i)perylene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Benzo(k)fluoranthene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Chrysene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Dibenz(a,h)anthracene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Fluoranthene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Fluorene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Indeno(1,2,3-cd)pyrene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Naphthalene | µg/L | Varies* | 50 | ND | ND | No | 4 | 4 |
| Phenanthrene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Pyrene | µg/L | Varies* | 2 | ND | ND | No | 4 | 4 |
| Total PCB | µg/L | Varies* | N/A | ND | ND | N/A | 4 | 4 |
| Phenol | µg/L | Varies* | 400 | ND | ND | No | 4 | 4 |
| TRH C6-C9 | µg/L | Varies* | 20 | ND | ND | No | 4 | 4 |
| TRH C10-C14 | µg/L | Varies* | 50 | ND | ND | No | 4 | 4 |
| TRH C15-C28 | µg/L | Varies* | 100 | ND | ND | No | 4 | 4 |
| TRH C29-C36 | µg/L | Varies* | 50 | ND | ND | No | 4 | 4 |

N/A – no licence limit, monitoring requirement only

ND – not detected

* Once prior to discharge during batch operation; once daily during intermittent continuous operation; once daily for the first fourteen days of continuous operation, then weekly.

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Turbidity

| Monitoring Parameter | EPL Point 2 (NTU) | EPL Point 3 (NTU) | EPL Point 4 (NTU) |
|------------------------------|---|-------------------|-------------------|
| Minimum | 2.0 | 0.7 | 1.3 |
| Maximum | 18.9 | 12.0 | 9.5 |
| Mean | 5.23 | 2.08 | 2.10 |
| Limit | No licence limit, monitoring requirement only | | |
| Number of Exceedences | N/A | N/A | N/A |

Conductivity

| Monitoring Parameter | EPL Point 2 (mS/cm) | EPL Point 3 (mS/cm) | EPL Point 4 (mS/cm) |
|------------------------------|---|---------------------|---------------------|
| Minimum | 46.5 | 37.5 | 30.7 |
| Maximum | 55 | 54.9 | 54.9 |
| Mean | 52.56 | 51.83 | 52.41 |
| Limit | No licence limit, monitoring requirement only | | |
| Number of Exceedences | N/A | N/A | N/A |

pH

| Monitoring Parameter | EPL Point 2 | EPL Point 3 | EPL Point 4 |
|------------------------------|---|-------------|-------------|
| Minimum | 7.61 | 6.56 | 7.97 |
| Maximum | 7.97 | 7.90 | 8.35 |
| Mean | 7.86 | 7.35 | 8.25 |
| Limit | No licence limit, monitoring requirement only | | |
| Number of Exceedences | N/A | N/A | N/A |

Temperature

| Monitoring Parameter | EPL Point 2 (°C) | EPL Point 3 (°C) | EPL Point 4 (°C) |
|------------------------------|---|------------------|------------------|
| Minimum | 19.98 | 18.83 | 20.00 |
| Maximum | 22.68 | 22.74 | 22.77 |
| Mean | 21.20 | 21.16 | 21.30 |
| Limit | No licence limit, monitoring requirement only | | |
| Number of Exceedences | N/A | N/A | N/A |

Frequency

| Monitoring Parameter | EPL Point 2 | EPL Point 3 | EPL Point 4 |
|---|------------------|-------------|-------------|
| Monitoring frequency required by licence | Every 15 minutes | | |
| NTU Samples Collected & Analysed * | 99.7% | 76.5% | 99.8% |
| pH Samples Collected & Analysed * | 99.8% | 99.8% | 99.8% |
| Conductivity Samples Collected & Analysed * | 99.7% | 99.8% | 99.5% |
| Temperature Samples Collected & Analysed * | 99.8% | 99.8% | 99.8% |

* Based on the percentage of data recovery for the month

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