

Berth 103 Stage 2 Dredging - Water Pollutant Monitoring

Site TB2 NW of OHDSCA

Easting 307825

Northing 6183604

| Parameter | Units | LOR | Baseline | | | Dredging | | | | | | |
|---|--------|--------|------------|------------|------------|------------|-----------|------------|------------|------------|-----------|-----------|
| | | | 14/05/2015 | 20/05/2015 | 26/05/2015 | 23/06/2015 | 4/07/2015 | 10/07/2015 | 22/07/2015 | 29/07/2015 | 5/08/2015 | 8/10/2015 |
| Metals | | | | | | | | | | | | |
| Aluminium | mg/L | 0.01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.01 | <0.10 | <0.10 |
| Antimony | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Arsenic | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.003 | <0.010 | <0.010 |
| Cadmium | mg/L | 0.0001 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0001 | <0.0010 | <0.0010 |
| Chromium | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.001 | <0.010 | <0.001 | <0.010 | <0.010 |
| Cobalt | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Copper | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Lead | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Nickel | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Selenium | mg/L | 0.01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.02 | <0.10 | <0.10 |
| Silver | mg/L | 0.001 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.001 | <0.010 | <0.010 |
| Vanadium | mg/L | 0.01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.01 | <0.10 | <0.10 |
| Zinc | mg/L | 0.005 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.005 | 0.092 | <0.050 |
| Iron | mg/L | 0.05 | <0.50 | <0.10 | <0.10 | <0.10 | <0.05 | <0.05 | <0.10 | <0.05 | 0.11 | <0.50 |
| Mercury | mg/L | 0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Polynuclear Aromatic Hydrocarbons (PAHs) | | | | | | | | | | | | |
| Naphthalene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Acenaphthylene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Acenaphthene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Fluorene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phenanthrene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Anthracene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Fluoranthene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Pyrene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benz(a)anthracene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chrysene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(b+j)fluoranthene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(k)fluoranthene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | µg/L | 0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dibenz(a.h)anthracene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(g.h.i)perylene | µg/L | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Sum of PAHs | µg/L | 0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ (zero) | µg/L | 0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Organotin Compounds | | | | | | | | | | | | |
| Tributyltin | ngSn/L | 2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <3 | <2 | <2 |

CERTIFICATE OF ANALYSIS

| | |
|--|---|
| Work Order : EW1512044 Client : Port Kembla Operations P/L ATF Port Kembla Unit Trust Contact : MR Trevor Brown Address : Maritime Centre, Level 3, 91 Foreshore Road PO Box 215 Port Kembla 2505 E-mail : trevor.brown@nswportskembla.com.au Telephone : +61 02 4275 0714 Facsimile : ---- Project : Berth 103 Dredging - Pollutant Monitoring Order number : ---- C-O-C number : ---- Sampler : Glenn Davies Site : ---- Quote number : ---- | Page : 1 of 4 Laboratory : Environmental Division NSW South Coast Contact : Aneta Prosaroski Address : 1/19 Ralph Black Drive, North Wollongong, 2500 E-mail : aneta.prosaroski@alsglobal.com Telephone : 02 4225 3125 Facsimile : W 02 42253128 N 02 44232083 QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement Date Samples Received : 08-Oct-2015 13:45 Date Analysis Commenced : 14-Oct-2015 Issue Date : 19-Oct-2015 23:33 No. of samples received : 5 No. of samples analysed : 5 |
|--|---|

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

| <i>Signatories</i> | <i>Position</i> | <i>Accreditation Category</i> |
|--------------------|------------------------|-------------------------------|
| Matt Frost | Senior Organic Chemist | Brisbane Organics |
| Pabi Subba | Senior Organic Chemist | Sydney Organics |
| Shobhna Chandra | Metals Coordinator | Sydney Inorganics |
| Wisam Marassa | Inorganics Coordinator | Sydney Inorganics |



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
∅ = ALS is not NATA accredited for these tests.

- EG020: LOR's have been raised due to matrix interference. (High Total Dissolved Solids)
- EG035: Poor matrix spike recovery was obtained for Mercury on sample ES1533290 # 1 due to high matrix interference. Confirmed by re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.



Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | Point 1 | Point 2 | Point 3 | Point 4 | Point 5 |
|---|------------|----------|------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Client sampling date / time | | | | | 08-Oct-2015 13:09 | 08-Oct-2015 12:16 | 08-Oct-2015 12:27 | 08-Oct-2015 12:42 | 08-Oct-2015 12:52 |
| Compound | CAS Number | LOR | Unit | EW1512044-001 | EW1512044-002 | EW1512044-003 | EW1512044-004 | EW1512044-005 | |
| | | | | Result | Result | Result | Result | Result | |
| EG020F: Dissolved Metals by ICP-MS | | | | | | | | | |
| Aluminium | 7429-90-5 | 0.01 | mg/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Silver | 7440-22-4 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Antimony | 7440-36-0 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Arsenic | 7440-38-2 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Cadmium | 7440-43-9 | 0.0001 | mg/L | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | |
| Chromium | 7440-47-3 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Copper | 7440-50-8 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Cobalt | 7440-48-4 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Nickel | 7440-02-0 | 0.001 | mg/L | 0.014 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Lead | 7439-92-1 | 0.001 | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | |
| Selenium | 7782-49-2 | 0.01 | mg/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Zinc | 7440-66-6 | 0.005 | mg/L | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | |
| Vanadium | 7440-62-2 | 0.01 | mg/L | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Iron | 7439-89-6 | 0.05 | mg/L | <0.10 | <0.50 | <0.50 | <0.50 | <0.50 | |
| EG035F: Dissolved Mercury by FIMS | | | | | | | | | |
| Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | |
| EP075(SIM)B: Polynuclear Aromatic Hydrocarbons | | | | | | | | | |
| Naphthalene | 91-20-3 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Acenaphthylene | 208-96-8 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Acenaphthene | 83-32-9 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Fluorene | 86-73-7 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Phenanthrene | 85-01-8 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Anthracene | 120-12-7 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Fluoranthene | 206-44-0 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Pyrene | 129-00-0 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benz(a)anthracene | 56-55-3 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Chrysene | 218-01-9 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(b+j)fluoranthene | 205-99-2 | 205-82-3 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(k)fluoranthene | 207-08-9 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | µg/L | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Dibenz(a.h)anthracene | 53-70-3 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | µg/L | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | µg/L | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | |



Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | Point 1 | Point 2 | Point 3 | Point 4 | Point 5 |
|---|------------|-----|--------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Client sampling date / time | | | | | 08-Oct-2015 13:09 | 08-Oct-2015 12:16 | 08-Oct-2015 12:27 | 08-Oct-2015 12:42 | 08-Oct-2015 12:52 |
| Compound | CAS Number | LOR | Unit | | EW1512044-001 | EW1512044-002 | EW1512044-003 | EW1512044-004 | EW1512044-005 |
| | | | | | Result | Result | Result | Result | Result |
| EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued | | | | | | | | | |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| EP090: Organotin Compounds (Soluble) | | | | | | | | | |
| Tributyltin | 56573-85-4 | 2 | ngSn/L | | <2 | <2 | <2 | <2 | <2 |
| EP075(SIM)S: Phenolic Compound Surrogates | | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 1 | % | | 19.5 | 26.0 | 29.6 | 29.4 | 22.6 |
| 2-Chlorophenol-D4 | 93951-73-6 | 1 | % | | 39.0 | 52.4 | 57.2 | 53.8 | 45.8 |
| 2,4,6-Tribromophenol | 118-79-6 | 1 | % | | 41.5 | 38.8 | 42.8 | 44.4 | 36.8 |
| EP075(SIM)T: PAH Surrogates | | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 1 | % | | 61.1 | 73.4 | 79.8 | 83.1 | 73.9 |
| Anthracene-d10 | 1719-06-8 | 1 | % | | 70.7 | 71.3 | 77.5 | 78.2 | 52.3 |
| 4-Terphenyl-d14 | 1718-51-0 | 1 | % | | 82.8 | 75.8 | 82.9 | 83.8 | 73.6 |
| EP090S: Organotin Surrogate | | | | | | | | | |
| Tripropyltin | ---- | 5 | % | | 97.0 | 110 | 68.0 | 78.9 | 108 |