

## Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ



|                      |                                                                                        |
|----------------------|----------------------------------------------------------------------------------------|
| Test Report ID       | MAR01632                                                                               |
| Issue Version        | 1                                                                                      |
| Customer             | Stena Line Limited, Stena House, Station Approach, Holyhead, Anglesey, Wales, LL65 1DQ |
| Customer Reference   | Holyhead Harbour - MMO Sediment Analysis                                               |
| Date Sampled         | 09-10-Nov-22                                                                           |
| Date Received        | 14-Nov-22                                                                              |
| Date Reported        | 07-Dec-22                                                                              |
| Condition of samples | Ambient      Satisfactory                                                              |

A handwritten signature in grey ink, appearing to read 'M. Hubbard'.

Authorised by: Marya Hubbard  
Position: Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

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Test Report ID MAR01632  
Issue Version 1  
Customer Reference Holyhead Harbour - MMO Sediment Analysis

|                   |              | Units         | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) |
|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 45mm                    | 31.5mm                  | 22.4mm                  | 16mm                    | 11.2mm                  | 8mm                     | 5.6mm                   |
| Client Reference: | SOCOTEC Ref: | Matrix        | -5.5                    | -5.0                    | -4.5                    | -4.0                    | -3.5                    | -3.0                    | -2.5                    |
| A                 | MAR01632.001 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| B                 | MAR01632.002 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| C                 | MAR01632.003 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.10                    |
| D                 | MAR01632.004 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.57                    |
| E                 | MAR01632.005 | Sediment      | 25.29                   | 5.22                    | 0.00                    | 0.00                    | 1.14                    | 0.99                    | 3.54                    |
| F                 | MAR01632.006 | Sediment      | 0.00                    | 0.00                    | 16.91                   | 25.46                   | 7.80                    | 2.39                    | 5.27                    |

\* See Report Notes

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|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 4mm                     | 2.8mm                   | 2mm                     | 1.4mm                   | 1mm                     | 707µm                   | 500µm                   |
| Client Reference: | SOCOTEC Ref: | Matrix        | -2.0                    | -1.5                    | -1.0                    | -0.5                    | 0.0                     | 0.5                     | 1.0                     |
| A                 | MAR01632.001 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| B                 | MAR01632.002 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    |
| C                 | MAR01632.003 | Sediment      | 0.13                    | 0.06                    | 0.02                    | 0.02                    | 0.04                    | 0.00                    | 0.00                    |
| D                 | MAR01632.004 | Sediment      | 0.12                    | 0.01                    | 0.05                    | 0.02                    | 0.03                    | 0.00                    | 0.00                    |
| E                 | MAR01632.005 | Sediment      | 1.76                    | 1.50                    | 1.42                    | 1.06                    | 0.75                    | 0.00                    | 0.00                    |
| F                 | MAR01632.006 | Sediment      | 2.37                    | 1.74                    | 1.89                    | 1.28                    | 0.99                    | 0.00                    | 0.00                    |

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|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 353.6µm                 | 250µm                   | 176.8µm                 | 125µm                   | 88.39µm                 | 63µm                    | 44.2µm                  |
| Client Reference: | SOCOTEC Ref: | Matrix        | 1.5                     | 2.0                     | 2.5                     | 3.0                     | 3.5                     | 4.0                     | 4.5                     |
| A                 | MAR01632.001 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.00                    | 0.74                    | 6.56                    |
| B                 | MAR01632.002 | Sediment      | 0.00                    | 0.00                    | 0.30                    | 1.39                    | 0.21                    | 2.86                    | 8.60                    |
| C                 | MAR01632.003 | Sediment      | 0.25                    | 5.11                    | 7.27                    | 6.84                    | 4.95                    | 8.28                    | 9.57                    |
| D                 | MAR01632.004 | Sediment      | 0.01                    | 1.90                    | 6.73                    | 6.27                    | 3.36                    | 7.23                    | 9.30                    |
| E                 | MAR01632.005 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.44                    | 0.61                    | 1.09                    | 4.81                    |
| F                 | MAR01632.006 | Sediment      | 0.00                    | 0.00                    | 0.00                    | 0.07                    | 0.14                    | 0.80                    | 3.24                    |

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|                   |              | Units         | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) | % (at 0.5phi intervals) |
|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 31.3µm                  | 22.1µm                  | 15.6µm                  | 11µm                    | 7.8µm                   | 5.5µm                   | 3.9µm                   |
| Client Reference: | SOCOTEC Ref: | Matrix        | 5.0                     | 5.5                     | 6.0                     | 6.5                     | 7.0                     | 7.5                     | 8.0                     |
| A                 | MAR01632.001 | Sediment      | 6.93                    | 7.97                    | 8.97                    | 10.55                   | 12.46                   | 12.51                   | 10.04                   |
| B                 | MAR01632.002 | Sediment      | 7.38                    | 7.86                    | 8.25                    | 9.17                    | 10.80                   | 11.33                   | 9.46                    |
| C                 | MAR01632.003 | Sediment      | 6.44                    | 5.87                    | 5.29                    | 5.65                    | 6.59                    | 6.83                    | 5.70                    |
| D                 | MAR01632.004 | Sediment      | 6.46                    | 6.13                    | 5.96                    | 6.48                    | 7.61                    | 7.99                    | 6.66                    |
| E                 | MAR01632.005 | Sediment      | 3.88                    | 4.19                    | 3.97                    | 3.97                    | 5.12                    | 5.63                    | 4.89                    |
| F                 | MAR01632.006 | Sediment      | 2.48                    | 2.61                    | 2.02                    | 2.29                    | 3.02                    | 3.26                    | 2.90                    |

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|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 2.75µm                  | 1.95µm                  | 1.38µm                  | 0.98µm                  | 0.69µm                  | 0.49µm                  | 0.34µm                  |
| Client Reference: | SOCOTEC Ref: | Matrix        | 8.5                     | 9.0                     | 9.5                     | 10.0                    | 10.5                    | 11.0                    | 11.5                    |
| A                 | MAR01632.001 | Sediment      | 6.56                    | 3.68                    | 2.29                    | 1.87                    | 1.78                    | 1.72                    | 1.58                    |
| B                 | MAR01632.002 | Sediment      | 6.33                    | 3.59                    | 2.23                    | 1.80                    | 1.70                    | 1.64                    | 1.50                    |
| C                 | MAR01632.003 | Sediment      | 3.84                    | 2.29                    | 1.58                    | 1.34                    | 1.23                    | 1.14                    | 1.03                    |
| D                 | MAR01632.004 | Sediment      | 4.45                    | 2.58                    | 1.70                    | 1.46                    | 1.39                    | 1.33                    | 1.21                    |
| E                 | MAR01632.005 | Sediment      | 3.54                    | 2.58                    | 2.24                    | 2.01                    | 1.76                    | 1.59                    | 1.47                    |
| F                 | MAR01632.006 | Sediment      | 2.18                    | 1.59                    | 1.34                    | 1.16                    | 1.00                    | 0.91                    | 0.84                    |

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|-------------------|--------------|---------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                   |              | Method No     | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 | *SUB_01                 |
|                   |              | Accreditation | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     | MMO                     |
|                   |              |               | 0.24µm                  | 0.17µm                  | 0.12µm                  | 0.09µm                  | 0.06µm                  | 0.04µm                  | <0.04µm                 |
| Client Reference: | SOCOTEC Ref: | Matrix        | 12.0                    | 12.5                    | 13.0                    | 13.5                    | 14.0                    | 14.5                    | >14.5                   |
| A                 | MAR01632.001 | Sediment      | 1.34                    | 1.02                    | 0.74                    | 0.46                    | 0.19                    | 0.02                    | 0.00                    |
| B                 | MAR01632.002 | Sediment      | 1.28                    | 0.98                    | 0.72                    | 0.44                    | 0.18                    | 0.02                    | 0.00                    |
| C                 | MAR01632.003 | Sediment      | 0.88                    | 0.68                    | 0.51                    | 0.32                    | 0.13                    | 0.02                    | 0.00                    |
| D                 | MAR01632.004 | Sediment      | 1.04                    | 0.80                    | 0.60                    | 0.37                    | 0.15                    | 0.02                    | 0.00                    |
| E                 | MAR01632.005 | Sediment      | 1.27                    | 0.97                    | 0.69                    | 0.42                    | 0.16                    | 0.02                    | 0.00                    |
| F                 | MAR01632.006 | Sediment      | 0.74                    | 0.56                    | 0.40                    | 0.24                    | 0.09                    | 0.01                    | 0.00                    |

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|                                                     |              | Units              | mg/Kg (Dry Weight) |              |               |             |              |             |           |           |
|-----------------------------------------------------|--------------|--------------------|--------------------|--------------|---------------|-------------|--------------|-------------|-----------|-----------|
|                                                     |              | Method No          | ICPMSS*            |              |               |             |              |             |           |           |
|                                                     |              | Limit of Detection | 0.5                | 0.04         | 0.5           | 0.5         | 0.01         | 0.5         | 0.5       | 2         |
|                                                     |              | Accreditation      | UKAS/MMO           | UKAS/MMO     | UKAS/MMO      | UKAS/MMO    | UKAS/MMO     | UKAS/MMO    | UKAS/MMO  | UKAS/MMO  |
| Client Reference:                                   | SOCOTEC Ref: | Matrix             | Arsenic (As)       | Cadmium (Cd) | Chromium (Cr) | Copper (Cu) | Mercury (Hg) | Nickel (Ni) | Lead (Pb) | Zinc (Zn) |
| A                                                   | MAR01632.001 | Sediment           | 21.7               | 2.08         | 47.4          | 48.6        | 0.30         | 39.5        | 206       | 532       |
| B                                                   | MAR01632.002 | Sediment           | 22.4               | 2.08         | 43.6          | 50.9        | 0.34         | 38.7        | 241       | 624       |
| C                                                   | MAR01632.003 | Sediment           | 21.8               | 1.76         | 47.2          | 48.2        | 0.32         | 39.3        | 215       | 550       |
| D                                                   | MAR01632.004 | Sediment           | 23.3               | 1.71         | 43.3          | 50.8        | 0.34         | 38.4        | 202       | 534       |
| E                                                   | MAR01632.005 | Sediment           | 20.6               | 2.19         | 41.5          | 49.4        | 0.33         | 35.6        | 240       | 639       |
| F                                                   | MAR01632.006 | Sediment           | 18.5               | 2.07         | 36.1          | 49.9        | 0.32         | 35.3        | 249       | 644       |
| Certified Reference Material SETOC 774 (% Recovery) |              |                    | 101                | 97           | 96            | 100         | 103          | 106         | 104       | 101       |
| QC Blank                                            |              |                    | <0.5               | <0.04        | <0.5          | <0.5        | <0.01        | <0.5        | <0.5      | <2        |

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Test Report ID MAR01632

Issue Version 1

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## REPORT NOTES

| Method Code | Sample ID        | The following information should be taken into consideration when using the data contained within this report                    |
|-------------|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| *SUB_01     | MAR01632.001-006 | Analysis was conducted by an approved subcontracted laboratory.                                                                  |
| ICPMSS*     | MAR01632.001-006 | Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252. |

## DEVIATING SAMPLE STATEMENT

| Deviation Code | Deviation Definition                                      | Sample ID | Deviation Details. The following information should be taken into consideration when using the data contained within this report |
|----------------|-----------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------|
| D1             | Holding Time Exceeded                                     | N/A       | N/A                                                                                                                              |
| D2             | Sample Contaminated through Damaged Packaging             | N/A       | N/A                                                                                                                              |
| D3             | Sample Contaminated through Sampling                      | N/A       | N/A                                                                                                                              |
| D4             | Inappropriate Container/Packaging                         | N/A       | N/A                                                                                                                              |
| D5             | Damaged in Transit                                        | N/A       | N/A                                                                                                                              |
| D6             | Insufficient Quantity of Sample                           | N/A       | N/A                                                                                                                              |
| D7             | Inappropriate Headspace                                   | N/A       | N/A                                                                                                                              |
| D8             | Retained at Incorrect Temperature                         | N/A       | N/A                                                                                                                              |
| D9             | Lack of Date & Time of Sampling                           | N/A       | N/A                                                                                                                              |
| D10            | Insufficient Sample Details                               | N/A       | N/A                                                                                                                              |
| D11            | Sample integrity compromised or not suitable for analysis | N/A       | N/A                                                                                                                              |

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| Method                 | Sample and Fraction Size | Method Summary                                              |
|------------------------|--------------------------|-------------------------------------------------------------|
| Particle Size Analysis | Wet Sediment             | Wet and dry sieving followed by laser diffraction analysis. |
| Metals                 | Air dried                | Aqua-regia extraction followed by ICP analysis.             |