

Lochness

## Dissolved Oxygen Analysis Log Sheet

Institute of Ocean Sciences

Water Properties Group

Last Updated: January 2017



| Cruise and Analysis Information                                                |                                | Nisk ID | Nisk Int V | Nisk Int S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|---------|------------|------------|-----------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1       | ✓          | ✓          | 710       | 196     | 7.6           | 3.272        |                | 1       |           |         |               |              |                |
| Event:                                                                         | 151                            | 2       | ✓          | ✓          | 711       | 396     | 7.6           | 3.287        |                | 2       |           |         |               |              |                |
| Station:                                                                       | HA14                           | 3       | ✓          | ✓          | 712       | 471     | 7.6           | 3.361        |                | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 08/25/2018                     | 4       | ✓          | ✓          | 713       | 505     | 7.6           | 3.407        | →              | 4       | 713B      | 712     | 7.7           | 3.405        | ☺              |
| Analysis Date (Local):                                                         | 26 Aug 18                      | 5       | ✓          | ✓          | 714       | 1055    | 7.7           | 3.453        |                | 5       |           |         |               |              |                |
| Analyst:                                                                       | Tamara                         | 6       | ✓          | ✓          | 715       | 1223    | 7.9           | 3.494        |                | 6       |           |         |               |              |                |
| Stdization Date (Local):                                                       | 26 Aug 18                      | 7       | ✓          | ✓          | 716       | 1094    | 8.3           | 3.692        |                | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8       | ✓          | ✓          | 717       | 1406    | 9.2           | 4.288        |                | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.49097                        | 9       | ✓          | ✓          | 718       | 1407    | 14.2          | 7.085        |                | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004207                      | 10      |            |            |           |         |               |              |                | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241136                       | 11      |            |            |           |         |               |              |                | 11      |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12      |            |            |           |         |               |              |                | 12      |           |         |               |              |                |
|                                                                                | No                             | 13      |            |            |           |         |               |              |                | 13      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14      |            |            |           |         |               |              |                | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15      |            |            |           |         |               |              |                | 15      |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16      |            |            |           |         |               |              |                | 16      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17      |            |            |           |         |               |              |                | 17      |           |         |               |              |                |
|                                                                                | THIO                           | 18      |            |            |           |         |               |              |                | 18      |           |         |               |              |                |
| Notes:                                                                         |                                | 19      |            |            |           |         |               |              |                | 19      |           |         |               |              |                |
|                                                                                |                                | 20      |            |            |           |         |               |              |                | 20      |           |         |               |              |                |
|                                                                                |                                | 21      |            |            |           |         |               |              |                | 21      |           |         |               |              |                |
|                                                                                |                                | 22      |            |            |           |         |               |              |                | 22      |           |         |               |              |                |
|                                                                                |                                | 23      |            |            |           |         |               |              |                | 23      |           |         |               |              |                |
|                                                                                |                                | 24      |            |            |           |         |               |              |                | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|                |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <del>710</del> | <del>711</del> | <del>712</del> | <del>713</del> | <del>714</del> | <del>715</del> | <del>716</del> | <del>717</del> | <del>718</del> |
| OXY            | OXY            | OXY            | OXY            | OXY            | OXY            | OXY            | OXY            | OXY            |
| HA14           | HA14           | HA14           | HA14           | HA14           | HA14           | HA14           | HA14           | HA14           |
| 2018-25        | 2018-25        | 2018-25        | 2018-25        | 2018-25        | 2018-25        | 2018-25        | 2018-25        | 2018-25        |
| Bot 1          | Bot 2          | Bot 3          | Bot 4          | Bot 5          | Bot 6          | Bot 7          | Bot 8          | Bot 9          |

Dissolved Oxygen Analysis Log Sheet

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Lochness

| Cruise and Analysis Information                                                |                                |    |  |  |     |      | Nisk ID | Nisk Int V | Nisk Int S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|----|--|--|-----|------|---------|------------|------------|-----------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1  |  |  | 719 | 1416 | 7.7     | 3.003      |            |           |         |               |              |                | 1       |           |         |               |              |                |
| Event:                                                                         | 154                            | 2  |  |  | 720 | 2055 | 7.7     | 3.008      |            |           |         |               |              |                | 2       |           |         |               |              |                |
| Station:                                                                       | HAW14                          | 3  |  |  | 721 | 2056 | 7.7     | 3.025      |            |           |         |               |              |                | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 08/25/2018                     | 4  |  |  | 722 | 2060 | 7.7     | 3.071      |            |           |         |               |              |                | 4       |           |         |               |              |                |
| Analysis Date (Local):                                                         | 26 Aug 18                      | 5  |  |  | 723 | 2065 | 7.8     | 3.235      |            |           |         |               | →            |                | 5       | 723B      | 2068    | 7.9           | 3.235        | ☺ ☺ ☺          |
| Analyst:                                                                       | Tamarac                        | 6  |  |  | 724 | 2089 | 8.0     | 3.485      |            |           |         |               |              |                | 6       |           |         |               |              |                |
| Stdization Date (Local):                                                       | 26 Aug 18                      | 7  |  |  | 725 | 3005 | 8.3     | 3.601      |            |           |         |               |              |                | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8  |  |  | 726 | 3046 | 12.2    | 5.516      |            |           |         |               |              |                | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.49097                        | 9  |  |  | 727 | 3049 | 15.5    | 7.154      |            |           |         |               |              |                | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004207                      | 10 |  |  |     |      |         |            |            |           |         |               |              |                | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241136                       | 11 |  |  |     |      |         |            |            |           |         |               |              |                | 11      |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12 |  |  |     |      |         |            |            |           |         |               |              |                | 12      |           |         |               |              |                |
|                                                                                | No                             | 13 |  |  |     |      |         |            |            |           |         |               |              |                | 13      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14 |  |  |     |      |         |            |            |           |         |               |              |                | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15 |  |  |     |      |         |            |            |           |         |               |              |                | 15      |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16 |  |  |     |      |         |            |            |           |         |               |              |                | 16      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17 |  |  |     |      |         |            |            |           |         |               |              |                | 17      |           |         |               |              |                |
|                                                                                | THIO                           | 18 |  |  |     |      |         |            |            |           |         |               |              |                | 18      |           |         |               |              |                |
| Notes:                                                                         |                                | 19 |  |  |     |      |         |            |            |           |         |               |              |                | 19      |           |         |               |              |                |
|                                                                                |                                | 20 |  |  |     |      |         |            |            |           |         |               |              |                | 20      |           |         |               |              |                |
|                                                                                |                                | 21 |  |  |     |      |         |            |            |           |         |               |              |                | 21      |           |         |               |              |                |
|                                                                                |                                | 22 |  |  |     |      |         |            |            |           |         |               |              |                | 22      |           |         |               |              |                |
|                                                                                |                                | 23 |  |  |     |      |         |            |            |           |         |               |              |                | 23      |           |         |               |              |                |
|                                                                                |                                | 24 |  |  |     |      |         |            |            |           |         |               |              |                | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |         |                  |                  |         |         |         |         |
|---------|---------|---------|---------|------------------|------------------|---------|---------|---------|---------|
| 719     | 720     | 721     | 722     | 723 <sup>A</sup> | 723 <sup>B</sup> | 724     | 725     | 726     | 727     |
| OXY     | OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     |
| HAW14   | HAW14   | HAW14   | HAW14   | HAW14            | HAW14            | HAW14   | HAW14   | HAW14   | HAW14   |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 2   | Bot 3   | Bot 4   | Bot 5            | Bot 5            | Bot 6   | Bot 7   | Bot 8   | Bot 9   |

Whale

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| Cruise and Analysis Information                                                |                                     | Nisk ID | Nisk Int V S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments              | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|-------------------------------------|---------|--------------|-----------|---------|---------------|--------------|-----------------------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                             | 1       |              | 728       | 94      | 7.6           | 2.792        |                             | 1       |           |         |               |              |                |
| Event:                                                                         | 157                                 | 2       |              | 729       | 371     | 7.6           | 2.828        |                             | 2       |           |         |               |              |                |
| Station:                                                                       | OI20                                | 3       |              | 730       | 621     | 7.6           | 2.846        |                             | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 25 Aug 18                           | 4       |              | 731       | 1408    | 7.7           | 2.879        |                             | 4       |           |         |               |              |                |
| Analysis Date (Local):                                                         | 28 Aug 18                           | 5       |              | 732       | 1429    | 7.8           | 2.910        | →                           | 5       | 732B      | 2007    | 7.8           | 2.911        | 😊😊             |
| Analyst:                                                                       | Tamara                              | 6       |              | 733       | 2015    | 9.7           | 2.962        |                             | 6       |           |         |               |              |                |
| Stdization Date (Local):                                                       | 28 Aug 18                           | 7       |              | 734       | 2016    | 7.7           | 2.993        |                             | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                            | 8       |              | 735       | 2017    | 7.7           | 3.037        |                             | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                           | 9       |              | 736       | 2019    | 7.8           | 3.149        |                             | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                           | 10      |              | 737       | 2025    | 7.8           | 3.256        |                             | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                            | 11      |              | 738       | 2027    | 7.9           | 3.359        | →                           | 11      | 738B      | 2032    | 8.0           | 3.360        | 😊😊             |
| Sample Flask Water Seal?                                                       | (Yes) No                            | 12      |              | 739       | 2043    | 8.1           | 3.522        |                             | 12      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>                   | 13      |              | 740       | 2047    | 8.5           | 3.735        |                             | 13      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                            | 14      |              | 741       | 2092    | 11.9          | 4.866        | got sample no temp recorded | 14      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | H <sub>2</sub> SO <sub>4</sub> none | 15      |              | 742       | 3009    | 13.7          | 6.889        |                             | 15      |           |         |               |              |                |
|                                                                                | KIO <sub>3</sub>                    | 16      |              |           |         |               |              |                             | 16      |           |         |               |              |                |
|                                                                                | THIO                                | 17      |              |           |         |               |              |                             | 17      |           |         |               |              |                |
| Notes:                                                                         |                                     | 18      |              |           |         |               |              |                             | 18      |           |         |               |              |                |
|                                                                                |                                     | 19      |              |           |         |               |              |                             | 19      |           |         |               |              |                |
|                                                                                |                                     | 20      |              |           |         |               |              |                             | 20      |           |         |               |              |                |
|                                                                                |                                     | 21      |              |           |         |               |              |                             | 21      |           |         |               |              |                |
|                                                                                |                                     | 22      |              |           |         |               |              |                             | 22      |           |         |               |              |                |
|                                                                                |                                     | 23      |              |           |         |               |              |                             | 23      |           |         |               |              |                |
|                                                                                |                                     | 24      |              |           |         |               |              |                             | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

lumpy titration curves

|         |         |         |         |
|---------|---------|---------|---------|
| 728     | 729     | 730     | 731     |
| OXY     | OXY     | OXY     | OXY     |
| 0I20    | 0I20    | 0I20    | 0I20    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 2   | Bot 3   | Bot 4   |

|                  |                  |
|------------------|------------------|
| <sup>A</sup> 732 | <sup>B</sup> 732 |
| OXY              | OXY              |
| 0I20             | 0I20             |
| 2018-25          | 2018-25          |
| Bot 5            | Bot 5            |

|         |         |
|---------|---------|
| 733     | 734     |
| OXY     | OXY     |
| 0I20    | 0I20    |
| 2018-25 | 2018-25 |
| Bot 6   | Bot 7   |

|         |         |         |
|---------|---------|---------|
| 735     | 736     | 737     |
| OXY     | OXY     | OXY     |
| 0I20    | 0I20    | 0I20    |
| 2018-25 | 2018-25 | 2018-25 |
| Bot 8   | Bot 9   | Bot 10  |

|                  |                  |         |         |
|------------------|------------------|---------|---------|
| <sup>A</sup> 738 | <sup>B</sup> 738 | 739     | 740     |
| OXY              | OXY              | OXY     | OXY     |
| 0I20             | 0I20             | 0I20    | 0I20    |
| 2018-25          | 2018-25          | 2018-25 | 2018-25 |
| Bot 11           | Bot 11           | Bot 12  | Bot 13  |

|         |         |
|---------|---------|
| 742     | 741     |
| OXY     | OXY     |
| 0I20    | 0I20    |
| 2018-25 | 2018-25 |
| Bot 15  | Bot 14  |

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biggie whale

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| Cruise and Analysis Information                                                |                                | Nisk ID | Nisk Int V | Nisk Int S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments                                                                                                                                                                      | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|---------|------------|------------|-----------|---------|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1       |            |            | 821       | 3032    | 8.3           | 2.350        |                                                                                                                                                                                     | 1       |           |         |               |              |                |
| Event:                                                                         | 182                            | 2       |            |            | 822       | 3033    |               |              |                                                                                                                                                                                     | 2       |           |         |               |              |                |
| Station:                                                                       | JP54                           | 3       |            |            | 823       | 3054    | 8.3           | 2.373        |                                                                                                                                                                                     | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 27 Aug 18                      | 4       |            |            | 824       | 3065    | 8.3           | 2.505        |                                                                                                                                                                                     | 4       | 824B      | 3062    | 8.3           | 2.505        | ☺ ☺ ☺          |
| Analysis Date (Local):                                                         | 28 Aug 18                      | 5       |            |            | 825       | 3094    | 8.6           | 2.608        |                                                                                                                                                                                     | 5       |           |         |               |              |                |
| Analyst:                                                                       | Tamara                         | 6       |            |            | 826       | 3100    | 9.1           | 2.864        |                                                                                                                                                                                     | 6       |           |         |               |              |                |
| Stdization Date (Local):                                                       | 28 Aug 18                      | 7       |            |            | 827       | 3116    | 10.3          | 3.607        |                                                                                                                                                                                     | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8       |            |            | 828       | 3117    | 11.9          | 4.210        |                                                                                                                                                                                     | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                      | 9       |            |            | 829       | 3127    | 14.1          | 4.963        |                                                                                                                                                                                     | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                      | 10      |            |            | 830       | 3145    | 15.1          | 5.285        |                                                                                                                                                                                     | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                       | 11      |            |            | 831       | 3147    | 16.2          | 5.666        | } so many little salps in these samples that little blobs stuck to the titrant burette tip when I took it out of the samples. And then looked like they had I <sub>2</sub> in them. | 11      |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12      |            |            | 832       | 3158    | 17.3          | 5.853        |                                                                                                                                                                                     | 12      |           |         |               |              |                |
|                                                                                | No                             | 13      |            |            |           |         |               |              |                                                                                                                                                                                     | 13      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14      |            |            |           |         |               |              |                                                                                                                                                                                     | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15      |            |            |           |         |               |              |                                                                                                                                                                                     | 15      |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16      |            |            |           |         |               |              |                                                                                                                                                                                     | 16      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17      |            |            |           |         |               |              |                                                                                                                                                                                     | 17      |           |         |               |              |                |
|                                                                                | THIO                           | 18      |            |            |           |         |               |              |                                                                                                                                                                                     | 18      |           |         |               |              |                |
| Notes:                                                                         |                                | 19      |            |            |           |         |               |              |                                                                                                                                                                                     | 19      |           |         |               |              |                |
|                                                                                |                                | 20      |            |            |           |         |               |              |                                                                                                                                                                                     | 20      |           |         |               |              |                |
|                                                                                |                                | 21      |            |            |           |         |               |              |                                                                                                                                                                                     | 21      |           |         |               |              |                |
|                                                                                |                                | 22      |            |            |           |         |               |              |                                                                                                                                                                                     | 22      |           |         |               |              |                |
|                                                                                |                                | 23      |            |            |           |         |               |              |                                                                                                                                                                                     | 23      |           |         |               |              |                |
|                                                                                |                                | 24      |            |            |           |         |               |              |                                                                                                                                                                                     | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |                  |                  |         |         |         |         |         |         |         |         |
|---------|---------|---------|------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| 821     | 822     | 823     | 824 <sup>A</sup> | 824 <sup>B</sup> | 825     | 826     | 827     | 828     | 829     | 830     | 831     | 832     |
| OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     |
| JPS4    | JPS4    | JPS4    | JPS4             | JPS4             | JPS4    | JPS4    | JPS4    | JPS4    | JPS4    | JPS4    | JPS4    | JPS4    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 2   | Bot 3   | Bot 4            | Bot 4            | Bot 5   | Bot 6   | Bot 7   | Bot 8   | Bot 9   | Bot 10  | Bot 11  | Bot 12  |

↑  
no sample

Dissolved Oxygen Analysis Log Sheet

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Bruce (the Shark, duh!)

| Cruise and Analysis Information                                                |                                |    |  |  |      |      | Nisk ID | Nisk Int V S | Sample ID                            | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|----|--|--|------|------|---------|--------------|--------------------------------------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1  |  |  | 833  | 3042 | 11.5    | 3.539        | such a relief to see a normal curve! | 1       |               |              |                |         |           |         |               |              |                |
| Event:                                                                         | 190                            | 2  |  |  |      |      |         |              |                                      | 2       |               |              |                |         |           |         |               |              |                |
| Station:                                                                       | JPN3                           | 3  |  |  | 835A | 3049 | 11.9    | 3.743        |                                      | 3       | 835B          | 3049         | 11.9           | 3.741   | 😊         |         |               |              |                |
| Event Date (Local):                                                            | 28 Aug 18                      | 4  |  |  | 836  | 3070 | 12.1    | 3.913        |                                      | 4       |               |              |                |         |           |         |               |              |                |
| Analysis Date (Local):                                                         | 28 Aug 18                      | 5  |  |  | 837  | 2088 | 13.9    | 4.953        | salps but curve looks OK             | 5       |               |              |                |         |           |         |               |              |                |
| Analyst:                                                                       | Tamara                         | 6  |  |  |      |      |         |              |                                      | 6       |               |              |                |         |           |         |               |              |                |
| Stdization Date (Local):                                                       | 28 Aug 18                      | 7  |  |  | 839  | 3008 | 14.8    | 5.461        |                                      | 7       |               |              |                |         |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8  |  |  | 840  | 2090 | 15.2    | 5.723        |                                      | 8       |               |              |                |         |           |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                      | 9  |  |  | 841  | 3020 | 16.1    | 6.002        |                                      | 9       |               |              |                |         |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                      | 10 |  |  |      |      |         |              |                                      | 10      |               |              |                |         |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                       | 11 |  |  | 843  | 673  | 16.5    | 6.126        |                                      | 11      |               |              |                |         |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12 |  |  |      |      |         |              |                                      | 12      |               |              |                |         |           |         |               |              |                |
|                                                                                | No                             | 13 |  |  |      |      |         |              |                                      | 13      |               |              |                |         |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14 |  |  |      |      |         |              |                                      | 14      |               |              |                |         |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15 |  |  |      |      |         |              |                                      | 15      |               |              |                |         |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16 |  |  |      |      |         |              |                                      | 16      |               |              |                |         |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17 |  |  |      |      |         |              |                                      | 17      |               |              |                |         |           |         |               |              |                |
|                                                                                | THIO                           | 18 |  |  |      |      |         |              |                                      | 18      |               |              |                |         |           |         |               |              |                |
| Notes:                                                                         |                                | 19 |  |  |      |      |         |              |                                      | 19      |               |              |                |         |           |         |               |              |                |
|                                                                                |                                | 20 |  |  |      |      |         |              |                                      | 20      |               |              |                |         |           |         |               |              |                |
|                                                                                |                                | 21 |  |  |      |      |         |              |                                      | 21      |               |              |                |         |           |         |               |              |                |
|                                                                                |                                | 22 |  |  |      |      |         |              |                                      | 22      |               |              |                |         |           |         |               |              |                |
|                                                                                |                                | 23 |  |  |      |      |         |              |                                      | 23      |               |              |                |         |           |         |               |              |                |
|                                                                                |                                | 24 |  |  |      |      |         |              |                                      | 24      |               |              |                |         |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |                  |                  |         |         |         |         |         |         |
|---------|------------------|------------------|---------|---------|---------|---------|---------|---------|
| 833     | 835 <sup>A</sup> | 835 <sup>B</sup> | 836     | 837     | 839     | 840     | 841     | 843     |
| OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     |
| JPN3    | JPN3             | JPN3             | JPN3    | JPN3    | JPN3    | JPN3    | JPN3    | JPN3    |
| 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 3            | Bot 3            | Bot 4   | Bot 5   | Bot 7   | Bot 8   | Bot 9   | Bot 11  |

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Shark

| Cruise and Analysis Information                                                |    |  |  |     |      |      | Nisk ID | Nisk Int V | S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|----|--|--|-----|------|------|---------|------------|---|-----------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number: 2018-25                                                         | 1  |  |  | 844 | 1465 | 9.5  | 2.802   |            |   |           |         |               |              |                | 1       |           |         |               |              |                |
| Event: 193                                                                     | 2  |  |  |     |      |      |         |            |   |           |         |               |              |                | 2       |           |         |               |              |                |
| Station: JPC1                                                                  | 3  |  |  | 846 | 2000 | 9.5  | 2.954   |            |   |           |         |               |              |                | 3       |           |         |               |              |                |
| Event Date (Local): 28 Aug 18                                                  | 4  |  |  | 847 | 3075 | 9.6  | 3.014   | →          |   |           |         |               |              |                | 4       | 847B      | 3200    | 9.7           | 3.014        | ☺☺☺☺           |
| Analysis Date (Local): 28 Aug 18                                               | 5  |  |  | 848 | 3080 | 10.1 | 3.017   |            |   |           |         |               |              |                | 5       |           |         |               |              |                |
| Analyst: Tamar C                                                               | 6  |  |  | 849 | 3085 | 10.5 | 3.379   |            |   |           |         |               |              |                | 6       |           |         |               |              |                |
| Stdization Date (Local): 28 Aug 18                                             | 7  |  |  | 850 | 2086 | 12.5 | 4.250   |            |   |           |         |               |              |                | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N: 0.011833                                                   | 8  |  |  |     |      |      |         |            |   |           |         |               |              |                | 8       |           |         |               |              |                |
| Standard Titer: 0.4903508                                                      | 9  |  |  | 852 | 2063 | 14.6 | 5.355   |            |   |           |         |               |              |                | 9       |           |         |               |              |                |
| Blank Titer: 0.0004958                                                         | 10 |  |  | 853 | 462  | 15.1 | 5.563   |            |   |           |         |               |              |                | 10      |           |         |               |              |                |
| THIO N: 0.241349                                                               | 11 |  |  | 854 | 425  | 15.5 | 5.457   |            |   |           |         |               |              |                | 11      |           |         |               |              |                |
| Sample Flask Water Seal? <input checked="" type="radio"/> Yes                  | 12 |  |  |     |      |      |         |            |   |           |         |               |              |                | 12      |           |         |               |              |                |
| Water Seal? No                                                                 | 13 |  |  | 856 | 2040 | 16.5 | 5.660   | →          |   |           |         |               |              |                | 13      | 856B      | 3076    | 16.6          | 5.662        | ☺              |
| Reagent Change? MnCl <sub>2</sub>                                              | 14 |  |  |     |      |      |         |            |   |           |         |               |              |                | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | 15 |  |  |     |      |      |         |            |   |           |         |               |              |                | 15      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | 16 |  |  |     |      |      |         |            |   |           |         |               |              |                | 16      |           |         |               |              |                |
|                                                                                | 17 |  |  |     |      |      |         |            |   |           |         |               |              |                | 17      |           |         |               |              |                |
|                                                                                | 18 |  |  |     |      |      |         |            |   |           |         |               |              |                | 18      |           |         |               |              |                |
| Notes:                                                                         | 19 |  |  |     |      |      |         |            |   |           |         |               |              |                | 19      |           |         |               |              |                |
| I made lots of boo boos in this box file but fixed during analysis             | 20 |  |  |     |      |      |         |            |   |           |         |               |              |                | 20      |           |         |               |              |                |
|                                                                                | 21 |  |  |     |      |      |         |            |   |           |         |               |              |                | 21      |           |         |               |              |                |
|                                                                                | 22 |  |  |     |      |      |         |            |   |           |         |               |              |                | 22      |           |         |               |              |                |
|                                                                                | 23 |  |  |     |      |      |         |            |   |           |         |               |              |                | 23      |           |         |               |              |                |
|                                                                                | 24 |  |  |     |      |      |         |            |   |           |         |               |              |                | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

844  
OXY  
JPC1  
2018-25  
Bot 1

846  
OXY  
JPC1  
2018-25  
Bot 3

847<sup>A</sup>  
OXY  
JPC1  
2018-25  
Bot 4

847<sup>B</sup>  
OXY  
JPC1  
2018-25  
Bot 4

848  
OXY  
JPC1  
2018-25  
Bot 5

849  
OXY  
JPC1  
2018-25  
Bot 6

850  
OXY  
JPC1  
2018-25  
Bot 7

852  
OXY  
JPC1  
2018-25  
Bot 9

853  
OXY  
JPC1  
2018-25  
Bot 10

854  
OXY  
JPC1  
2018-25  
Bot 11

856<sup>A</sup>  
OXY  
JPC1  
2018-25  
Bot 13

856<sup>B</sup>  
OXY  
JPC1  
2018-25  
Bot 13

# LOCH NESS MONSTER

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| Cruise and Analysis Information                                                |                                | Nisk ID | Nisk Int V S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments                                                                                          |
|--------------------------------------------------------------------------------|--------------------------------|---------|--------------|-----------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|---------------------------------------------------------------------------------------------------------|
| Cruise Number:                                                                 | 2018-25                        | 1       | ✓✓           | 857       | 196     | 10.8          | 3.545        |                | 1       |           |         |               |              |                                                                                                         |
| Event:                                                                         | 196                            | 2       |              | 858       | 396     |               |              |                | 2       |           |         |               |              |                                                                                                         |
| Station:                                                                       | LSK1                           | 3       | ✓✓           | 859       | 396     | 10.9          | 3.626        |                | 3       |           |         |               |              |                                                                                                         |
| Event Date (Local):                                                            | 28 Aug 18                      | 4       | ✓✓           | 860       | 471     | 11.2          | 3.687        |                | 4       |           |         |               |              |                                                                                                         |
| Analysis Date (Local):                                                         | 28 Aug 18                      | 5       | ✓✓           | 861       | 505     | 12.3          | 3.970        |                | 5       |           |         |               |              |                                                                                                         |
| Analyst:                                                                       | Tamara                         | 6       |              | 862       |         |               |              |                | 6       |           |         |               |              |                                                                                                         |
| Stdization Date (Local):                                                       | 28 Aug 18                      | 7       | ✓✓           | 863       | 712     | 13.7          | 4.531        |                | 7       | 863B      | 1055    | 13.8          | 4.524        |                                                                                                         |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8       | ✓✓           | 864       | 1223    | 14.7          | 4.834        | ←              | 8       |           |         |               |              | <div>Comprimised</div> <div>Comprimised</div> <div>Comprimised</div> <div>other Nuts taken first.</div> |
| Standard Titer:                                                                | 0.4903508                      | 9       | ✓✓           | 865       | 1094    | 15.3          | 5.096        | ←              | 9       |           |         |               |              |                                                                                                         |
| Blank Titer:                                                                   | 0.0004958                      | 10      |              |           |         |               |              |                | 10      |           |         |               |              |                                                                                                         |
| THIO N:                                                                        | 0.241349                       | 11      | ✓✓           | 867       | 1406    | 16.5          | 5.470        | ←              | 11      |           |         |               |              |                                                                                                         |
| Sample Flask Water Seal?                                                       | Yes                            | 12      |              |           |         |               |              |                | 12      |           |         |               |              |                                                                                                         |
|                                                                                | No                             | 13      |              |           |         |               |              |                | 13      |           |         |               |              |                                                                                                         |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14      |              |           |         |               |              |                | 14      |           |         |               |              |                                                                                                         |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15      |              |           |         |               |              |                | 15      |           |         |               |              |                                                                                                         |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16      |              |           |         |               |              |                | 16      |           |         |               |              |                                                                                                         |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17      |              |           |         |               |              |                | 17      |           |         |               |              |                                                                                                         |
|                                                                                | THIO                           | 18      |              |           |         |               |              |                | 18      |           |         |               |              |                                                                                                         |
| Notes:                                                                         |                                | 19      |              |           |         |               |              |                | 19      |           |         |               |              |                                                                                                         |
|                                                                                |                                | 20      |              |           |         |               |              |                | 20      |           |         |               |              |                                                                                                         |
|                                                                                |                                | 21      |              |           |         |               |              |                | 21      |           |         |               |              |                                                                                                         |
|                                                                                |                                | 22      |              |           |         |               |              |                | 22      |           |         |               |              |                                                                                                         |
|                                                                                |                                | 23      |              |           |         |               |              |                | 23      |           |         |               |              |                                                                                                         |
|                                                                                |                                | 24      |              |           |         |               |              |                | 24      |           |         |               |              |                                                                                                         |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |         |                  |                  |         |         |
|---------|---------|---------|---------|------------------|------------------|---------|---------|
| 857     | 859     | 860     | 861     | 863 <sup>A</sup> | 863 <sup>B</sup> | 864     | 867     |
| OXY     | OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     |
| LSK1    | LSK1    | LSK1    | LSK1    | LSK1             | LSK1             | LSK1    | LSK1    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 |
| Bot 1   | Bot 3   | Bot 4   | Bot 5   | Bot 7            | Bot 7            | Bot 8   | Bot 11  |

865  
OXY  
LSK1  
2018-25  
Bot 9

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| Cruise and Analysis Information                                                |                                | Nisk ID | Nisk Int V S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments                                                | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|---------|--------------|-----------|---------|---------------|--------------|---------------------------------------------------------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1       | ✓✓           | 868       | 1416    | 10.1          | 3.347        |                                                               | 1       |           |         |               |              |                |
| Event:                                                                         | 201                            | 2       |              |           |         |               |              |                                                               | 2       |           |         |               |              |                |
| Station:                                                                       | LIO1                           | 3       | ✓✓           | 870       | 2055    | 10.3          | 3.491        |                                                               | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 08/28/2018                     | 4       | ✓✓           | 871       | 2056    | 11.3          | 3.846        | →                                                             | 4       | 871B      | 2060    | 11.4          | 3.844        | ☺              |
| Analysis Date (Local):                                                         | 29 Aug 18                      | 5       | ✓✓           | 872       | 2065    | 11.9          | 3.986        |                                                               | 5       |           |         |               |              |                |
| Analyst:                                                                       | Tamar                          | 6       |              |           |         |               |              |                                                               | 6       |           |         |               |              |                |
| Stdization Date (Local):                                                       | 28 Aug 18                      | 7       | ✓✓           | 874       | 2068    | 13.1          | 4.418        |                                                               | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8       | ✓✓           | 875       | 2089    | 15.0          | 5.075        |                                                               | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                      | 9       | ✓✓           | 876       | 3005    | 15.3          | 5.163        |                                                               | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                      | 10      | ✓✓           | 877       | 3046    | 15.4          | 5.251        |                                                               | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                       | 11      | X X          | 878       | 3049    | 16.0          | 5.557        | bottle integrity compromised; previously sampled accidentally | 11      |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12      |              |           |         |               |              | + salps in sample                                             | 12      |           |         |               |              |                |
|                                                                                | No                             | 13      |              |           |         |               |              |                                                               | 13      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14      |              |           |         |               |              |                                                               | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15      |              |           |         |               |              |                                                               | 15      |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16      |              |           |         |               |              |                                                               | 16      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17      |              |           |         |               |              |                                                               | 17      |           |         |               |              |                |
|                                                                                | THIO                           | 18      |              |           |         |               |              |                                                               | 18      |           |         |               |              |                |
| Notes:                                                                         |                                | 19      |              |           |         |               |              |                                                               | 19      |           |         |               |              |                |
|                                                                                |                                | 20      |              |           |         |               |              |                                                               | 20      |           |         |               |              |                |
|                                                                                |                                | 21      |              |           |         |               |              |                                                               | 21      |           |         |               |              |                |
|                                                                                |                                | 22      |              |           |         |               |              |                                                               | 22      |           |         |               |              |                |
|                                                                                |                                | 23      |              |           |         |               |              |                                                               | 23      |           |         |               |              |                |
|                                                                                |                                | 24      |              |           |         |               |              |                                                               | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |              |              |         |         |         |         |         |         |
|---------|---------|--------------|--------------|---------|---------|---------|---------|---------|---------|
| 868     | 870     | 871 <i>A</i> | 871 <i>B</i> | 872     | 874     | 875     | 876     | 877     | 878     |
| OXY     | OXY     | OXY          | OXY          | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     |
| LI01    | LI01    | LI01         | LI01         | LI01    | LI01    | LI01    | LI01    | LI01    | LI01    |
| 2018-25 | 2018-25 | 2018-25      | 2018-25      | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 3   | Bot 4        | Bot 4        | Bot 5   | Bot 7   | Bot 8   | Bot 9   | Bot 10  | Bot 11  |

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| Cruise and Analysis Information                                                |                                     | Nisk ID | Nisk Int V S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments                                  | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|-------------------------------------|---------|--------------|-----------|---------|---------------|--------------|-------------------------------------------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                             | 1       |              | 879       | 3050    | 5.9           | 0.442        |                                                 | 1       |           |         |               |              |                |
| Event:                                                                         | 206                                 | 2       |              |           |         |               |              |                                                 | 2       |           |         |               |              |                |
| Station:                                                                       | MT11                                | 3       |              | 881       | 1059    | 6.1           | 0.568        |                                                 | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 28 Aug 18                           | 4       |              | 882       | 3130    | 6.6           | 0.780        |                                                 | 4       |           |         |               |              |                |
| Analysis Date (Local):                                                         | 30 Aug 18                           | 5       |              | 883       | 3021    | 6.9           | 1.080        |                                                 | 5       |           |         |               |              |                |
| Analyst:                                                                       | Tamara                              | 6       |              | 884       | 3104    | 7.1           | 1.383        | → false start on 1st attempt, tip not in sample | 6       | 884       | 1053    | 7.3           | 1.380        | 😊              |
| Stdization Date (Local):                                                       | 28 Aug 18                           | 7       |              | 885       | 639     | 7.3           | 1.532        |                                                 | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                            | 8       |              | 886       | 3134    | 7.6           | 1.628        |                                                 | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.403508                            | 9       |              | 887       | 620     | 7.9           | 2.016        |                                                 | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                           | 10      |              | 888       | 3031    | 8.3           | 2.340        |                                                 | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                            | 11      |              | 889       | 2084    | 8.7           | 2.672        | →                                               | 11      | 889       | 715     | 8.8           | 2.661        |                |
| Sample Flask Water Seal?                                                       | (Yes) No                            | 12      |              |           |         |               |              |                                                 | 12      |           |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>                   | 13      |              | 891       | 1002    | 9.5           | 3.603        |                                                 | 13      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                            | 14      |              | 892       | 3035    | 10.6          | 3.885        |                                                 | 14      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | H <sub>2</sub> SO <sub>4</sub> none | 15      |              | 893       | 2075    | 11.5          | 4.751        |                                                 | 15      |           |         |               |              |                |
|                                                                                | KIO <sub>3</sub>                    | 16      |              | 894       | 3061    | 14.3          | 6.044        |                                                 | 16      |           |         |               |              |                |
|                                                                                | THIO                                | 17      |              | 895       | 647     | 14.3          | 6.029        |                                                 | 17      |           |         |               |              |                |
| Notes:                                                                         |                                     | 18      |              |           |         |               |              |                                                 | 18      |           |         |               |              |                |
|                                                                                |                                     | 19      |              |           |         |               |              |                                                 | 19      |           |         |               |              |                |
|                                                                                |                                     | 20      |              |           |         |               |              |                                                 | 20      |           |         |               |              |                |
|                                                                                |                                     | 21      |              |           |         |               |              |                                                 | 21      |           |         |               |              |                |
|                                                                                |                                     | 22      |              |           |         |               |              |                                                 | 22      |           |         |               |              |                |
|                                                                                |                                     | 23      |              |           |         |               |              |                                                 | 23      |           |         |               |              |                |
|                                                                                |                                     | 24      |              |           |         |               |              |                                                 | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |         |                  |                  |         |         |         |         |                              |                  |
|---------|---------|---------|---------|------------------|------------------|---------|---------|---------|---------|------------------------------|------------------|
| 879     | 881     | 882     | 883     | 884 <sup>A</sup> | 884 <sup>B</sup> | 885     | 886     | 887     | 888     | Label<br>lost<br>for<br>889A | 889 <sup>B</sup> |
| OXY     | OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     |                              | OXY              |
| MT11    | MT11    | MT11    | MT11    | MT11             | MT11             | MT11    | MT11    | MT11    | MT11    |                              | MT11             |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 |                              | 2018-25          |
| Bot 1   | Bot 3   | Bot 4   | Bot 5   | Bot 6            | Bot 6            | Bot 7   | Bot 8   | Bot 9   | Bot 10  |                              | Bot 11           |

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| 891     | 892     | 893     | 894     | 895     |
| OXY     | OXY     | OXY     | OXY     | OXY     |
| MT11    | MT11    | MT11    | MT11    | MT11    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 13  | Bot 14  | Bot 15  | Bot 16  | Bot 17  |

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Swallow.

| Cruise and Analysis Information                                                |                                | Nisk ID | Nisk Int V | Nisk Int S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments        | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|--------------------------------|---------|------------|------------|-----------|---------|---------------|--------------|-----------------------|---------|-----------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                        | 1       |            |            | 897       | 528     | 3.9           | 1.579        | bottom o-ring leaking | 1       |           |         |               |              |                |
| Event:                                                                         | 208                            | 2       |            |            |           |         |               |              |                       | 2       |           |         |               |              |                |
| Station:                                                                       | MS08                           | 3       |            |            | 899       | 3114    | 4.2           | 0.650        |                       | 3       |           |         |               |              |                |
| Event Date (Local):                                                            | 29 Aug 18                      | 4       |            |            | 900       | 3190    | 4.6           | 0.345        |                       | 4       |           |         |               |              |                |
| Analysis Date (Local):                                                         | 29 Aug 18                      | 5       |            |            | 901       | 3148    | 5.2           | 0.242        |                       | 5       |           |         |               |              |                |
| Analyst:                                                                       | Tamar                          | 6       |            |            | 902       | 3093    | 5.7           | 0.302        | →                     | 6       | 902       | 3138    | 5.8           | 0.290        |                |
| Stdization Date (Local):                                                       | 28 Aug 18                      | 7       |            |            | 903       | 2098    | 6.2           | 0.776        |                       | 7       |           |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                       | 8       |            |            | 904       | 745     | 6.7           | 1.152        |                       | 8       |           |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                      | 9       |            |            | 905       | 3146    | 7.1           | 1.419        |                       | 9       |           |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                      | 10      |            |            | 906       | 3053    | 7.5           | 2.222        |                       | 10      |           |         |               |              |                |
| THIO N:                                                                        | 0.241349                       | 11      |            |            | 907       | 611     | 8.1           | 2.856        |                       | 11      |           |         |               |              |                |
| Sample Flask Water Seal?                                                       | Yes                            | 12      |            |            | 908       | 510     | 8.6           | 2.941        |                       | 12      |           |         |               |              |                |
|                                                                                | No                             | 13      |            |            | 909       | 708     | 8.7           | 4.172        | →                     | 13      | 909       | 612     | 8.8           | 4.175        | 😊              |
| Reagent Change?                                                                | MnCl <sub>2</sub>              | 14      |            |            | 910       | 3038    | 8.9           | 5.384        |                       | 14      |           |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                       | 15      |            |            | 911       | 3209    | 10.5          | 5.243        |                       | 15      |           |         |               |              |                |
|                                                                                | H <sub>2</sub> SO <sub>4</sub> | 16      |            |            |           |         |               |              |                       | 16      |           |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | KIO <sub>3</sub>               | 17      |            |            | 913       | 3043    | 13.4          | 5.436        |                       | 17      |           |         |               |              |                |
|                                                                                | THIO                           | 18      |            |            | 914       | 3129    | 15.0          | 5.814        |                       | 18      |           |         |               |              |                |
| Notes:                                                                         |                                | 19      |            |            | 915       | 570     | 15.5          | 5.765        |                       | 19      |           |         |               |              |                |
|                                                                                |                                | 20      |            |            |           |         |               |              |                       | 20      |           |         |               |              |                |
|                                                                                |                                | 21      |            |            | 917       | 3175    | 15.6          | 5.774        |                       | 21      |           |         |               |              |                |
|                                                                                |                                | 22      |            |            |           |         |               |              |                       | 22      |           |         |               |              |                |
|                                                                                |                                | 23      |            |            |           |         |               |              |                       | 23      |           |         |               |              |                |
|                                                                                |                                | 24      |            |            |           |         |               |              |                       | 24      |           |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |         |                  |                  |         |         |         |         |         |
|---------|---------|---------|---------|------------------|------------------|---------|---------|---------|---------|---------|
| 897     | 899     | 900     | 901     | 902 <sup>A</sup> | 902 <sup>B</sup> | 903     | 904     | 905     | 906     | 907     |
| OXY     | OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     | OXY     |
| MS08    | MS08    | MS08    | MS08    | MS08             | MS08             | MS08    | MS08    | MS08    | MS08    | MS08    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 3   | Bot 4   | Bot 5   | Bot 6            | Bot 6            | Bot 7   | Bot 8   | Bot 9   | Bot 10  | Bot 11  |

|         |                  |                  |         |         |         |         |         |         |
|---------|------------------|------------------|---------|---------|---------|---------|---------|---------|
| 908     | 909 <sup>A</sup> | 909 <sup>B</sup> | 910     | 911     | 913     | 914     | 915     | 917     |
| OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     |
| MS08    | MS08             | MS08             | MS08    | MS08    | MS08    | MS08    | MS08    | MS08    |
| 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 12  | Bot 13           | Bot 13           | Bot 14  | Bot 15  | Bot 17  | Bot 18  | Bot 19  | Bot 21  |

# LOCH NESS

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| Cruise and Analysis Information                                                |                                     |  |  |  |  |  | Nisk ID | Nisk Int V | Nisk Int S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |  |
|--------------------------------------------------------------------------------|-------------------------------------|--|--|--|--|--|---------|------------|------------|-----------|---------|---------------|--------------|----------------|---------|-----------|---------|---------------|--------------|----------------|--|
| Cruise Number:                                                                 | 2018-25                             |  |  |  |  |  | 1       |            |            | 918       | 196     | 7.5           | 1.606        |                | 1       |           |         |               |              |                |  |
| Event:                                                                         | BT 212                              |  |  |  |  |  | 2       |            |            | 919       | 396     | 7.5           | 1.787        |                | 2       |           |         |               |              |                |  |
| Station:                                                                       | C14                                 |  |  |  |  |  | 3       |            |            | 920       | 471     | 7.9           | 2.449        | wavy line      | 3       | 920B      | 505     | 7.9           | 2.447        | ☺              |  |
| Event Date (Local):                                                            | 29 Aug 18                           |  |  |  |  |  | 4       |            |            | 921       | 712     | 8.2           | 2.717        |                | 4       |           |         |               |              |                |  |
| Analysis Date (Local):                                                         | 30 Aug 18                           |  |  |  |  |  | 5       |            |            | 922       | 1055    | 8.5           | 2.783        |                | 5       |           |         |               |              |                |  |
| Analyst:                                                                       | Tanner                              |  |  |  |  |  | 6       |            |            | 923       | 1223    | 9.1           | 3.382        |                | 6       |           |         |               |              |                |  |
| Stdization Date (Local):                                                       | 28 Aug 18                           |  |  |  |  |  | 7       |            |            | 924       | 1094    | 9.7           | 3.891        |                | 7       |           |         |               |              |                |  |
| KIO <sub>3</sub> N:                                                            | 0.011833                            |  |  |  |  |  | 8       |            |            | 925       | 1406    | 11.3          | 4.422        |                | 8       |           |         |               |              |                |  |
| Standard Titer:                                                                | 0.4903508                           |  |  |  |  |  | 9       |            |            | 926       | 1407    |               |              |                | 9       |           |         |               |              |                |  |
| Blank Titer:                                                                   | 0.0004958                           |  |  |  |  |  | 10      |            |            | 927       | 1409    | 15.3          | 6.059        |                | 10      |           |         |               |              |                |  |
| THIO N:                                                                        | 0.241349                            |  |  |  |  |  | 11      |            |            |           |         |               |              |                | 11      |           |         |               |              |                |  |
| Sample Flask Water Seal?                                                       | (Yes)                               |  |  |  |  |  | 12      |            |            |           |         |               |              | 12             |         |           |         |               |              |                |  |
|                                                                                | No                                  |  |  |  |  |  | 13      |            |            |           |         |               |              | 13             |         |           |         |               |              |                |  |
| Reagent Change?                                                                | MnCl <sub>2</sub>                   |  |  |  |  |  | 14      |            |            |           |         |               |              | 14             |         |           |         |               |              |                |  |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                            |  |  |  |  |  | 15      |            |            |           |         |               |              | 15             |         |           |         |               |              |                |  |
| NOTE NEW BATCH IN LOG BOOK                                                     | H <sub>2</sub> SO <sub>4</sub> none |  |  |  |  |  | 16      |            |            |           |         |               |              | 16             |         |           |         |               |              |                |  |
|                                                                                | KIO <sub>3</sub>                    |  |  |  |  |  | 17      |            |            |           |         |               |              | 17             |         |           |         |               |              |                |  |
|                                                                                | THIO                                |  |  |  |  |  | 18      |            |            |           |         |               |              | 18             |         |           |         |               |              |                |  |
| Notes:                                                                         |                                     |  |  |  |  |  | 19      |            |            |           |         |               |              | 19             |         |           |         |               |              |                |  |
|                                                                                |                                     |  |  |  |  |  | 20      |            |            |           |         |               |              | 20             |         |           |         |               |              |                |  |
|                                                                                |                                     |  |  |  |  |  | 21      |            |            |           |         |               |              | 21             |         |           |         |               |              |                |  |
|                                                                                |                                     |  |  |  |  |  | 22      |            |            |           |         |               |              | 22             |         |           |         |               |              |                |  |
|                                                                                |                                     |  |  |  |  |  | 23      |            |            |           |         |               |              | 23             |         |           |         |               |              |                |  |
|                                                                                |                                     |  |  |  |  |  | 24      |            |            |           |         |               |              | 24             |         |           |         |               |              |                |  |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |               |              |         |         |         |         |         |         |         |
|---------|---------|---------------|--------------|---------|---------|---------|---------|---------|---------|---------|
| 918     | 919     | 920 <i>AS</i> | 920 <i>B</i> | 921     | 922     | 923     | 924     | 925     | 926     | 927     |
| OXY     | OXY     | OXY           | OXY          | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     | OXY     |
| CI4     | CI4     | CI4           | CI4          | CI4     | CI4     | CI4     | CI4     | CI4     | CI4     | CI4     |
| 2018-25 | 2018-25 | 2018-25       | 2018-25      | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 2   | Bot 3         | Bot 3        | Bot 4   | Bot 5   | Bot 6   | Bot 7   | Bot 8   | Bot 9   | Bot 10  |

↑  
no sample

LOC H NESS

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| Cruise and Analysis Information                                                |                                     | Nisk ID | Nisk Int V | S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments                                                                  | Nisk ID | Sample ID                                                     | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments |
|--------------------------------------------------------------------------------|-------------------------------------|---------|------------|---|-----------|---------|---------------|--------------|---------------------------------------------------------------------------------|---------|---------------------------------------------------------------|---------|---------------|--------------|----------------|
| Cruise Number:                                                                 | 2018-25                             | 1       | ✓          | ✓ | 928       | 2055    | 7.7           | 1.934        | really weird looking curve<br>also very weird<br>over titrated - curve very odd | 1       | I don't believe these<br>are good data - see notes on reverse |         |               |              |                |
| Event:                                                                         | 214                                 | 2       | ✓          | ✓ | 929       | 2056    | 8.2           | 2.134        |                                                                                 | 2       |                                                               |         |               |              |                |
| Station:                                                                       | CPE1                                | 3       | ✓          | ✓ | 930       | 2060    | 8.9           |              |                                                                                 | 3       |                                                               |         |               |              |                |
| Event Date (Local):                                                            | 29 Aug 18                           | 4       | ✓          | ✓ | 931       | 2065    | 9.8           | 3.280        |                                                                                 | 4       |                                                               |         |               |              |                |
| Analysis Date (Local):                                                         | 30 Aug 18                           | 5       | ✓          | ✓ | 932A      | 2068    | 10.1          | 3.628        | →                                                                               | 5       | 932B                                                          | 2089    | 10.1          | 3.628        | ☺              |
| Analyst:                                                                       | Tamar                               | 6       | ✓          | ✓ | 933       | 3005    | 10.1          | 3.758        |                                                                                 | 6       |                                                               |         |               |              |                |
| Stdization Date (Local):                                                       | 28 Aug 18                           | 7       | ✓          | ✓ | 934       | 3046    | 10.3          | 4.121        |                                                                                 | 7       |                                                               |         |               |              |                |
| KIO <sub>3</sub> N:                                                            | 0.011833                            | 8       | ✓          | ✓ | 935       | 3049    | 10.7          | 4.608        |                                                                                 | 8       |                                                               |         |               |              |                |
| Standard Titer:                                                                | 0.4903508                           | 9       |            |   |           |         |               |              |                                                                                 | 9       |                                                               |         |               |              |                |
| Blank Titer:                                                                   | 0.0004958                           | 10      |            |   |           |         |               |              |                                                                                 | 10      |                                                               |         |               |              |                |
| THIO N:                                                                        | 0.241349                            | 11      |            |   |           |         |               |              |                                                                                 | 11      |                                                               |         |               |              |                |
| Sample Flask Water Seal?                                                       | (Yes)<br>No                         | 12      |            |   |           |         |               |              |                                                                                 | 12      |                                                               |         |               |              |                |
| Reagent Change?                                                                | MnCl <sub>2</sub>                   | 13      |            |   |           |         |               |              |                                                                                 | 13      |                                                               |         |               |              |                |
| (Please circle reagent that was changed prior to sampling and standardization) | NaI/NaOH                            | 14      |            |   |           |         |               |              |                                                                                 | 14      |                                                               |         |               |              |                |
| NOTE NEW BATCH IN LOG BOOK                                                     | H <sub>2</sub> SO <sub>4</sub> none | 15      |            |   |           |         |               |              |                                                                                 | 15      |                                                               |         |               |              |                |
|                                                                                | KIO <sub>3</sub>                    | 16      |            |   |           |         |               |              |                                                                                 | 16      |                                                               |         |               |              |                |
|                                                                                | THIO                                | 17      |            |   |           |         |               |              |                                                                                 | 17      |                                                               |         |               |              |                |
| Notes:                                                                         |                                     | 18      |            |   |           |         |               |              |                                                                                 | 18      |                                                               |         |               |              |                |
|                                                                                |                                     | 19      |            |   |           |         |               |              |                                                                                 | 19      |                                                               |         |               |              |                |
|                                                                                |                                     | 20      |            |   |           |         |               |              |                                                                                 | 20      |                                                               |         |               |              |                |
|                                                                                |                                     | 21      |            |   |           |         |               |              |                                                                                 | 21      |                                                               |         |               |              |                |
|                                                                                |                                     | 22      |            |   |           |         |               |              |                                                                                 | 22      |                                                               |         |               |              |                |
|                                                                                |                                     | 23      |            |   |           |         |               |              |                                                                                 | 23      |                                                               |         |               |              |                |
|                                                                                |                                     | 24      |            |   |           |         |               |              |                                                                                 | 24      |                                                               |         |               |              |                |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |
|---------|---------|---------|
| 928     | 929     | 930     |
| OXY     | OXY     | OXY     |
| CPEI    | CPEI    | CPEI    |
| 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 2   | Bot 3   |

really weird  
curves

↑  
overtitrated  
bizarre 10  
curve

very poor titration  
curve too  
!!

1) Quit of program  
and started it  
again before dummy sample 99902 =  
Same kind of crummy curve

↳ detector now bouncing around a lot.  
Restarted computer - LVO2. Still detector issue.

Turned off detector power source for ~ 1/2 hour -  
restarted + volt bounce looks normal again -  
Running another dummy sample 99903  
→ Good curve.

928-930 in 21401  
931-935 in 21402

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| 931     | 932     | 933     | 934     | 935     |
| OXY     | OXY     | OXY     | OXY     | OXY     |
| CPEI    | CPEI    | CPEI    | CPEI    | CPEI    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 4   | Bot 5   | Bot 6   | Bot 7   | Bot 8   |

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| Cruise and Analysis Information                                                        |  | Nisk ID | Nisk Int V S | Sample ID | Flask 1 | Draw T 1 (°C) | OXY-1 (mL/L) | OXY-1 Comments                 | Nisk ID | Sample ID | Flask 2 | Draw T 2 (°C) | OXY-2 (mL/L) | OXY-2 Comments                     |
|----------------------------------------------------------------------------------------|--|---------|--------------|-----------|---------|---------------|--------------|--------------------------------|---------|-----------|---------|---------------|--------------|------------------------------------|
| Cruise Number: 2018-25                                                                 |  | 1       |              | 936       | 94      | 9.7           | 2.895        |                                | 1       |           |         |               |              |                                    |
| Event: SOG 217                                                                         |  | 2       |              |           |         |               |              |                                | 2       |           |         |               |              |                                    |
| Station: SOG-N(2)                                                                      |  | 3       |              | 938       | 371     | 9.6           | 2.962        |                                | 3       |           |         |               |              |                                    |
| Event Date (Local): Aug. 31, 2018                                                      |  | 4       |              |           |         |               |              |                                | 4       |           |         |               |              |                                    |
| Analysis Date (Local): 31 Aug 18                                                       |  | 5       |              | 940       | 621     | 9.7           | 2.992        |                                | 5       |           |         |               |              |                                    |
| Analyst: Tamar                                                                         |  | 6       |              |           |         |               |              |                                | 6       |           |         |               |              |                                    |
| Stdization Date (Local): 31 Aug 18                                                     |  | 7       |              | 942       | 1408    | 9.7           | 3.018        |                                | 7       |           |         |               |              |                                    |
| KIO <sub>3</sub> N: 0.011833                                                           |  | 8       |              |           |         |               |              |                                | 8       |           |         |               |              |                                    |
| Standard Titer: 0.4910643                                                              |  | 9       |              | 944A      | 1429    | 9.8           | 3.070        | →                              | 9       | 944B      | 2007    | 9.9           | 3.074        |                                    |
| Blank Titer: 0.000541                                                                  |  | 10      |              |           |         |               |              |                                | 10      |           |         |               |              |                                    |
| THIO N: 0.241113                                                                       |  | 11      |              | 946       | 2015    | 9.8           | 3.037        |                                | 11      |           |         |               |              |                                    |
| Sample Flask Water Seal? <input checked="" type="radio"/> Yes <input type="radio"/> No |  | 12      |              |           |         |               |              |                                | 12      |           |         |               |              |                                    |
| Reagent Change? MnCl <sub>2</sub>                                                      |  | 13      |              | 948       | 2016    | 9.9           | 3.049        |                                | 13      |           |         |               |              |                                    |
| (Please circle reagent that was changed prior to sampling and standardization)         |  | 14      |              |           |         |               |              |                                | 14      |           |         |               |              |                                    |
| NOTE NEW BATCH IN LOG BOOK                                                             |  | 15      |              | 950       | 2017    | 10.4          | 3.269        |                                | 15      |           |         |               |              |                                    |
|                                                                                        |  | 16      |              |           |         |               |              |                                | 16      |           |         |               |              |                                    |
|                                                                                        |  | 17      |              | 952       | 2019    | 10.7          | 3.342        | curve looking odd again - will | 17      |           |         |               |              | turn off deuter power supply again |
|                                                                                        |  | 18      |              |           |         |               |              |                                | 18      |           |         |               |              |                                    |
| Notes:                                                                                 |  | 19      |              | 954       | 2025    | 11.3          | 3.456        |                                | 19      |           |         |               |              |                                    |
|                                                                                        |  | 20      |              |           |         |               |              |                                | 20      |           |         |               |              |                                    |
|                                                                                        |  | 21      |              | 956       | 2027    | 12.1          | 3.721        |                                | 21      |           |         |               |              |                                    |
|                                                                                        |  | 22      |              |           |         |               |              |                                | 22      |           |         |               |              |                                    |
|                                                                                        |  | 23      |              | 958       | 2032    | 17.1          | 6.493        |                                | 23      |           |         |               |              |                                    |
|                                                                                        |  | 24      |              |           |         |               |              |                                | 24      |           |         |               |              |                                    |

Bottle integrity: First test the top vent (V) by opening the lower spigot (S) then test the spigot by opening the vent. Mark 'x' in the appropriate column if either fails the integrity check and explain this in the comments column.

|         |         |         |         |                  |                  |         |         |         |         |
|---------|---------|---------|---------|------------------|------------------|---------|---------|---------|---------|
| 936     | 938     | 940     | 942     | 944 <del>A</del> | 944 <sup>B</sup> | 946     | 948     | 950     | 952     |
| OXY     | OXY     | OXY     | OXY     | OXY              | OXY              | OXY     | OXY     | OXY     | OXY     |
| SOGN    | SOGN    | SOGN    | SOGN    | SOGN             | SOGN             | SOGN    | SOGN    | SOGN    | SOGN    |
| 2018-25 | 2018-25 | 2018-25 | 2018-25 | 2018-25          | 2018-25          | 2018-25 | 2018-25 | 2018-25 | 2018-25 |
| Bot 1   | Bot 3   | Bot 5   | Bot 7   | Bot 9            | Bot 9            | Bot 11  | Bot 13  | Bot 15  | Bot 17  |

|         |         |         |
|---------|---------|---------|
| 954     | 956     | 958     |
| OXY     | OXY     | OXY     |
| SOGN    | SOGN    | SOGN    |
| 2018-25 | 2018-25 | 2018-25 |
| Bot 19  | Bot 21  | Bot 23  |