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Tritium Laboratory  
24 February 2020

SWAB REPORT #976

SWAB DATE: 17 February 2020

*R/V Kilo Moana*

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SWAB Committee  
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## COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in  $\text{dpm}/\text{m}^2$ . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in  $\text{dpm}/\text{m}^2$ . An error larger than the activity indicates that the activity is not significantly different from zero.

### Criteria for SWAB Results

| Category | $^3\text{H}$ ( $\text{dpm}/\text{m}^2$ ) | $^{14}\text{C}$ ( $\text{dpm m}^2$ ) | Recommendations   |
|----------|--|--------------------------------------|---|
| A        | <500                                     | <50                                  | No action   |
| B*       | 500-10,000                               | 50-10,000                            | Needs cleaning before any natural tracer work. Decks in radiation vans with activities above $1000 \text{ dpm}/\text{m}^2$ should be cleaned. |
| C**      | 10,000-100,000                           | 10,000-50,000                        | Must be cleaned before any use.   |
| D***     | >100,000                                 | >50,000                              | May be a health hazard. Notify local radiation safety official.   |

Note:  $^{14}\text{C}$  and  $^{35}\text{S}$  have peak energies of 156 and 167 KeV, respectively; thus  $^{35}\text{S}$  will be registered as  $^{14}\text{C}$  by our counting techniques. Categories A, B and C are not a health hazard.

### Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

$^3\text{H}$ : Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

$^{14}\text{C}$ : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing  $^{14}\text{CO}_2$ ). Follow up with wash as if for  $^3\text{H}$ .

### Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D contact your institution's radiation safety office.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email.

REPORT FOR SWAB # 976

LOCATION: Portland, OR  
VESSEL/LAB: R/V Kilo Moana

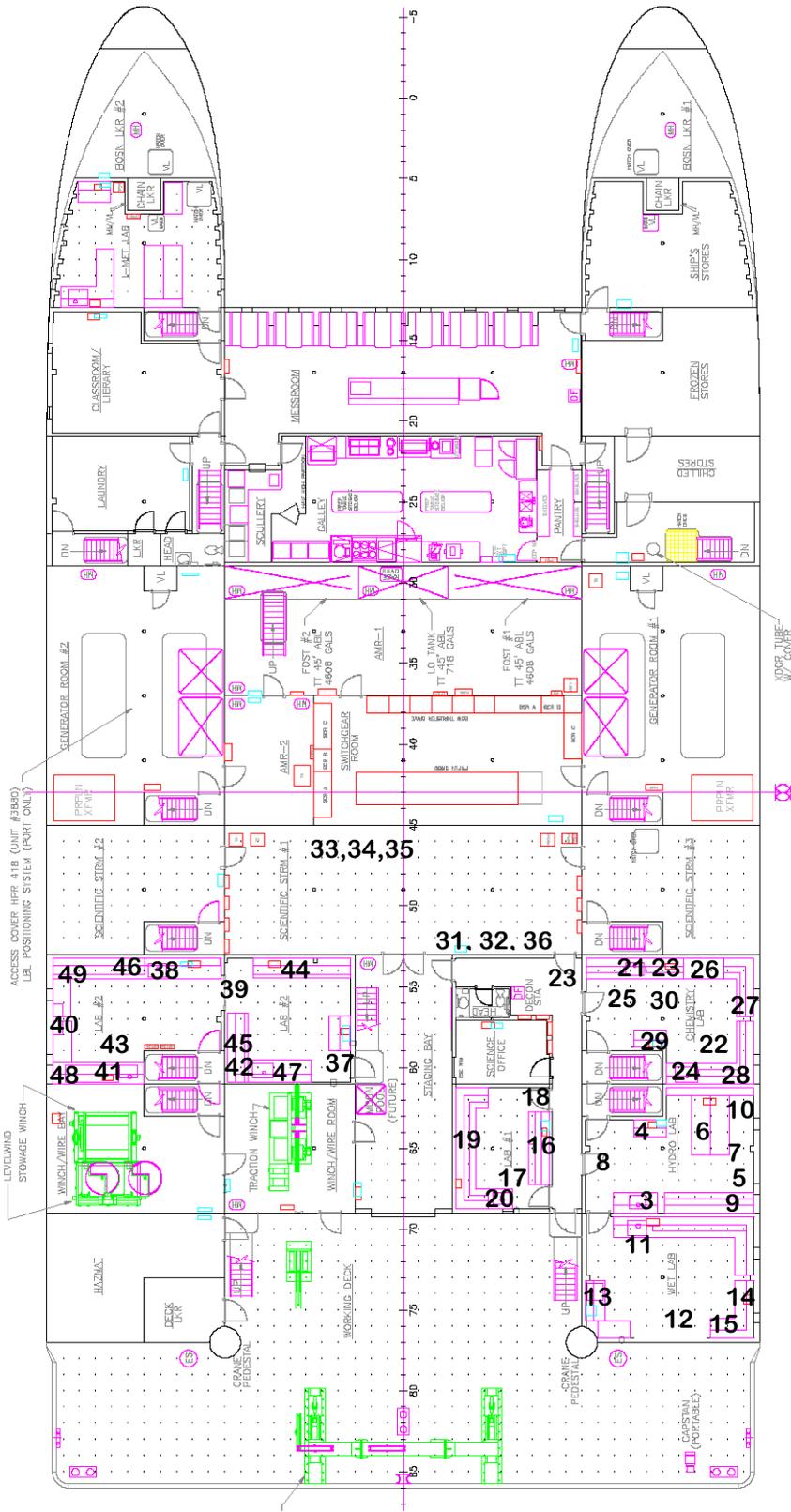
DATE: 17 February 2020  
TECHNICIAN: Jim Happell

| Sample # | Sample Identification                | $^3\text{H}$ dpm/m <sup>2</sup> |       | $^{14}\text{C}$ dpm/m <sup>2</sup> |       |
|----------|--------------------------------------|---------------------------------|-------|------------------------------------|-------|
|          |                                      | activity                        | error | activity                           | error |
| 1        | 1st Vial Bkgnd                       | 0                               | ± 0   | 0                                  | ± 0   |
| 2        | Initial bucket blank                 | 9                               | ± 82  | -7                                 | ± 49  |
|          | <u>Hydro Lab (Figure 1)</u>          |                                 |       |                                    |       |
| 3        | Hydro Aft sink area                  | -46                             | ± 87  | 29                                 | ± 43  |
| 4        | Forward benchtop                     | 3                               | ± 32  | -22                                | ± 33  |
| 5        | Starboard benchtop aft section       | -14                             | ± 30  | 3                                  | ± 50  |
| 6        | Port benchtop                        | -26                             | ± 55  | -15                                | ± 38  |
| 7        | Deck in front of starboard bench     | -32                             | ± 68  | -5                                 | ± 37  |
| 8        | Deck inside port entrance            | -10                             | ± 21  | -15                                | ± 39  |
| 9        | Aft benchtop                         | 25                              | ± 48  | 4                                  | ± 29  |
| 10       | Starboard benchtop forward section   | 17                              | ± 36  | -34                                | ± 50  |
|          | <u>Wet Lab (Figure 1)</u>            |                                 |       |                                    |       |
| 11       | Sink area                            | -10                             | ± 21  | -32                                | ± 48  |
| 12       | Deck inside aft hanger door entrance | -15                             | ± 32  | 16                                 | ± 41  |
| 13       | Port benchtop                        | -29                             | ± 62  | -38                                | ± 57  |
| 14       | Starboard benchtop                   | 19                              | ± 253 | -32                                | ± 48  |
| 15       | Aft benchtop                         | 18                              | ± 312 | -36                                | ± 53  |
|          | <u>Lab #1 (Figure 1)</u>             |                                 |       |                                    |       |
| 16       | Starboard benchtop                   | -5                              | ± 43  | -24                                | ± 36  |
| 17       | Deck below aft sink                  | -2                              | ± 15  | -24                                | ± 36  |
| 18       | Deck at forward entrance             | -34                             | ± 72  | -13                                | ± 33  |
| 19       | Port benchtop                        | -46                             | ± 88  | -4                                 | ± 26  |
| 20       | Aft benchtop                         | -43                             | ± 83  | -21                                | ± 31  |
|          | <u>Chemistry Lab (Figure 1)</u>      |                                 |       |                                    |       |
| 21       | Forward sink area                    | -33                             | ± 69  | -8                                 | ± 58  |
| 22       | Deck in front of aft sink            | -13                             | ± 28  | 8                                  | ± 42  |
| 23       | Benchtop between sink and fume hood  | -12                             | ± 26  | -30                                | ± 44  |
| 24       | Aft sink area                        | -19                             | ± 39  | -19                                | ± 48  |
| 25       | Deck at port entrance                | 16                              | ± 70  | -7                                 | ± 46  |
| 26       | Inside fume hood                     | -46                             | ± 88  | -9                                 | ± 60  |
| 27       | Starboard benchtop between portholes | 3                               | ± 27  | -23                                | ± 35  |
| 28       | Aft benchtop                         | 38                              | ± 79  | -24                                | ± 36  |
| 29       | Center benchtop opposite aft sink    | -17                             | ± 36  | -5                                 | ± 32  |
| 30       | Inside Kenmore refrigerator          | -35                             | ± 73  | -11                                | ± 27  |

| Sample #                                  | Sample Identification                      | <sup>3</sup> H dpm/m <sup>2</sup> |       | <sup>14</sup> C dpm/m <sup>2</sup> |       |
|---|--|-----------------------------------|-------|------------------------------------|-------|
|   |  | activity                          | error | activity                           | error |
| <u>Scientific Storage Area (Figure 1)</u> |  |                                   |       |                                    |       |
| 31  | Inside Cospolich refrigerator #1           | -39                               | ± 81  | -15                                | ± 40  |
| 32  | Inside Cospolich refrigerator #2           | -9                                | ± 85  | -36                                | ± 54  |
| 33  | Top of Kenmore chest freezer #3            | -27                               | ± 56  | -32                                | ± 48  |
| 34  | Top of Kenmore chest freezer #2            | -12                               | ± 26  | -26                                | ± 38  |
| 35  | Top of Kenmore chest freezer #1            | -20                               | ± 41  | -26                                | ± 39  |
| 36  | Inside Cospolich refrigerator #3           | -26                               | ± 55  | -27                                | ± 40  |
| <u>Lab #2 (Figure 1)</u>                  |  |                                   |       |                                    |       |
| 37  | Deck inside entrance                       | -25                               | ± 53  | -31                                | ± 46  |
| 38  | Forward sink area                          | -14                               | ± 30  | -28                                | ± 41  |
| 39  | Deck at bulkhead betw lab spaces           | -26                               | ± 55  | 8                                  | ± 47  |
| 40  | Port benchtop center section               | -52                               | ± 99  | -3                                 | ± 17  |
| 41  | Port aft sink area                         | -19                               | ± 39  | -8                                 | ± 58  |
| 42  | Benchtop opposite of port aft sink         | -40                               | ± 76  | -32                                | ± 47  |
| 43  | Deck in front of port aft sink             | -28                               | ± 59  | -8                                 | ± 55  |
| 44  | Forward bench under monitor                | -23                               | ± 49  | -4                                 | ± 24  |
| 45  | Benchtop against center bulkhead           | -20                               | ± 42  | -3                                 | ± 22  |
| 46  | Forward port benchtop next to forward sink | -2                                | ± 16  | -12                                | ± 31  |
| 47  | Starboard sink area                        | -17                               | ± 37  | -36                                | ± 53  |
| 48  | Aft bench next to port aft sink            | -6                                | ± 55  | -21                                | ± 31  |
| 49  | Foward port benchtop                       | 10                                | ± 94  | -46                                | ± 68  |
| 50  | Final bucket balnk                         | -24                               | ± 51  | 24                                 | ± 41  |

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas tested on the ship were free from contamination that requires cleaning



MAIN DECK