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Tritium Laboratory
5 April 2024

SWAB REPORT #1087

SWAB DATE: March 24, 2024

*R/V Kilo Moana* & OTG Rad Van

James Happell Digitally signed by James Happell
Date: 2024.04.06 06:28:33 +08'00'

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SWAB Committee
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**COMMENTS TO SWAB REPORTS** 15 December 2021

The LSC is now a Quantulus GCT 6220, with the SWAB counting assay having background cpm of 0.3 & 1.2 for $^{3}H$ & $^{14}C$. This replaces an LSC with background cpm of 1.6 & 5.5 for $^{3}H$ & $^{14}C$.

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

Criteria for SWAB Results

| Category | $^{3}H$ (dpm/$m^2$) | $^{14}C$ (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 dpm/$m^2$ 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: $^{14}C$ and $^{35}S$ have peak energies of 156 and 167 KeV, respectively; thus $^{35}S$ will be registered as $^{14}C$ by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Proceedure

Wearing ordinary household rubber gloves:

$^{3}H$: 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.

$^{14}C$: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}CO_2$). Follow up with wash as if for $^{3}H$.

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 # 1087

LOCATION: Honolulu, HI
VESSEL/LAB: *R/V Kilo Moana*

DATE: 24 March 2024
TECHNICIAN: Charlene Grall

| Sample # | Sample Identification | $^{3}$H dpm/m$^{2}$ | | | $^{14}$C dpm/m$^{2}$ | | |
|---|---|---|---|---|---|---|---|
| | | **activity** | | **error** | **activity** | | **error** |
| 1 | 1st Vial Background | 0 | ± | 0 | 0 | ± | 0 |
| 2 | Initial bucket blank CO #1 | 4 | ± | 15 | 1 | ± | 11 |
| | Lab #1 (Figure 1) | | | | | | |
| 3 | Starboard benchtop | -15 | ± | 21 | -8 | ± | 11 |
| 4 | Deck in center of lab | -16 | ± | 15 | 9 | ± | 14 |
| 5 | Port Benchtop | 14 | ± | 20 | 3 | ± | 10 |
| | Hydro Lab (Figure 1) | | | | | | |
| 6 | Starboard benchtop below forward porthole | 17 | ± | 17 | 12 | ± | 12 |
| 7 | Deck in front of starboard bench | 4 | ± | 9 | 9 | ± | 13 |
| 8 | Deck in front of aft sink | 12 | ± | 15 | 12 | ± | 13 |
| 9 | Aft benchtop | 4 | ± | 14 | 3 | ± | 12 |
| 10 | Forward benchtop | 31 | ± | 22 | 7 | ± | 11 |
| 11 | Aft sink area | -13 | ± | 18 | 12 | ± | 14 |
| 12 | Port benchtop | -7 | ± | 7 | 14 | ± | 14 |
| | Chemistry Lab (Figure 1) | | | | | | |
| 13 | Forward section of starboard benchtop | -12 | ± | 14 | 1 | ± | 25 |
| 14 | Aft section of starboard benchtop | 0 | ± | 1 | 11 | ± | 13 |
| 15 | Inside fume hood | 14 | ± | 16 | 8 | ± | 12 |
| 16 | Deck at port entrance | **24** | **±** | **23** | 0 | ± | 4 |
| 17 | Center benchtop in front of aft sink | **31** | **±** | **21** | 9 | ± | 11 |
| 18 | Forward sink area | -12 | ± | 679 | **26** | **±** | **14** |
| 19 | Deck in front of fume hood | -3 | ± | 24 | 13 | ± | 13 |
| 20 | Aft sink and adjacent benchtop | **23** | **±** | **22** | 1 | ± | 6 |
| 21 | Center benchtop opposite of forward sink | -6 | ± | 8 | -2 | ± | 9 |
| 22 | Forward benchtop between fume hood and sink | **34** | **±** | **19** | **20** | **±** | **13** |
| 23 | Deck in front of aft sink | **21** | **±** | **18** | **14** | **±** | **12** |
| | Wet Lab (Figure 1) | | | | | | |
| 24 | Forward sink and adjacent benchtop | **32** | **±** | **31** | -8 | ± | 12 |
| 25 | Starboard benchtop | 5 | ± | 7 | -12 | ± | 14 |
| 26 | Deck between CTD and forward sink | 13 | ± | 18 | 6 | ± | 11 |
| 27 | Deck port of CTD | 3 | ± | 5 | **18** | **±** | **13** |

| Sample # | Sample Identification | $^{3}$H dpm/m$^{2}$ activity | | error | $^{14}$C dpm/m$^{2}$ activity | | error |
|---|---|---|---|---|---|---|---|
| | Science Storeroom (Figure 1) | | | | | | |
| 28 | Inside Cospolich refrigerator #1 | 28 | ± | 29 | -12 | ± | 9 |
| 29 | Inside Cospolich refrigerator #2 | 12 | ± | 26 | 0 | ± | 23 |
| 30 | Inside Cospolich refrigerator #3 | -6 | ± | 25 | -27 | ± | 25 |
| | Lab #2 Starboard Side (Figure 1) | | | | | | |
| 31 | Port benchtop | 13 | ± | 21 | -2 | ± | 8 |
| 32 | Deck in center of lab | 28 | ± | 29 | -11 | ± | 13 |
| 33 | Aft sink and adjacent benchtop | -12 | ± | 15 | 7 | ± | 14 |
| 34 | Starboard benchtop | 10 | ± | 18 | 2 | ± | 10 |
| 35 | Forward benchtop | **24** | **±** | **21** | 2 | ± | 8 |
| | Lab #2 Port side (Figure 1) | | | | | | |
| 36 | Forward sink and adjacent benchtop | **27** | **±** | **21** | 8 | ± | 11 |
| 37 | Aft sink and adjacent benchtop | 14 | ± | 14 | **19** | **±** | **13** |
| 38 | Intermediate bucket blank | 12 | ± | 15 | 8 | ± | 12 |
| 39 | Deck in front of aft sink | 7 | ± | 8 | **28** | **±** | **14** |
| 40 | Forward benchtop | -25 | ± | 24 | **20** | **±** | **14** |
| 41 | Port benchtop | 6 | ± | 12 | 8 | ± | 12 |
| | OTG Rad Van, Ser#592.2.01 (Figure 2) | | | | | | |
| 42 | Benchtop next to front entrance | **35** | **±** | **18** | **33** | **±** | **14** |
| 43 | Inside refrigerator near front entrance | **90** | **±** | **30** | 4 | ± | 6 |
| 44 | Benchtop opposite front entrance | **291** | **±** | **49** | **22** | **±** | **9** |
| 45 | Deck inside front entrance | **422** | **±** | **71** | **47** | **±** | **12** |
| 46 | Inside fume hood | **74** | **±** | **28** | 7 | ± | 9 |
| 47 | Deck inside rear entrance near fume hood | ***656** | **±** | **80** | ***57** | **±** | **11** |
| 48 | Benchtop adjacent to fume hood | ***717** | **±** | **75** | ***63** | **±** | **12** |
| 49 | Inside refrigerator nearest to fume hood | 2 | ± | 3 | **24** | **±** | **14** |
| 50 | Benchtop adjacent to LSC | **107** | **±** | **32** | 7 | ± | 8 |
| 51 | Deck between the two refrigerators | ***1140** | **±** | **108** | ***73** | **±** | **11** |
| 52 | Final bucket blank | -5 | ± | 6 | 5 | ± | 13 |

## 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. 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. Please note that we are now using a Quantulus 6220 LSC which counts very near natural background. While the cleanup standards have not changed; all values above background will now be in bold. All areas on the ship were free from isotope contamination requiring cleaning. The Rad Van had minor $^{3}$H contamination. No action is necessary.

Figure 1
SWAB # 1087
24 March 2024

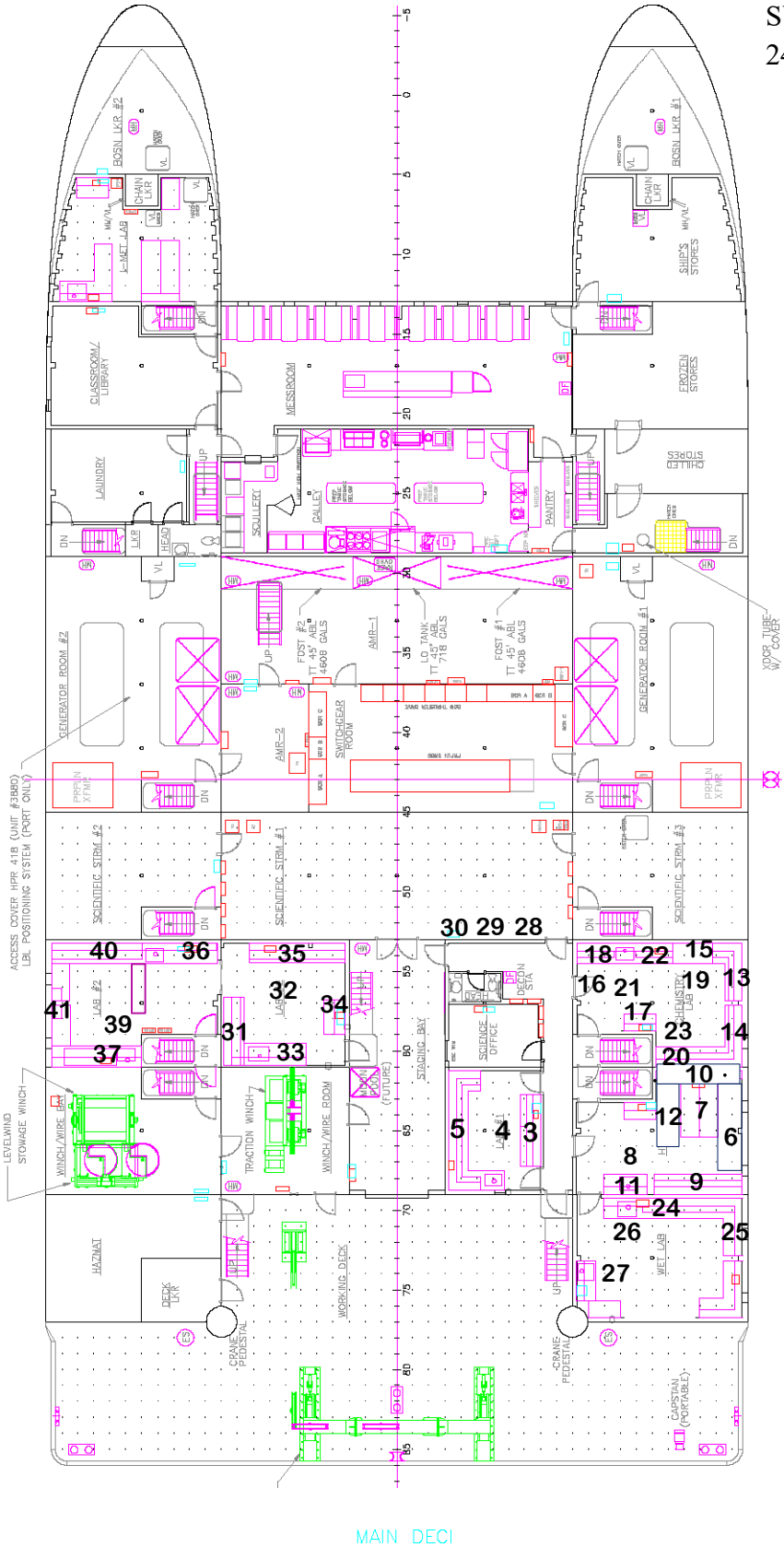

Figure #2
SWAB #1086
24 March 2024