



Tritium Laboratory
20 December 2021

SWAB REPORT #1020

SWAB DATE: 12 December 2021

R/V Kilo Moana & OTC Rad Van

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Distribution:
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 ^3H & ^{14}C . This replaces an LSC with background cpm of 1.6 & 5.5 for ^3H & ^{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	^3H (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 Procedure

Wearing ordinary household rubber gloves:

^3H : 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 $^{14}\text{CO}_2$). Follow up with wash as if for ^3H .

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 # 1020

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

DATE: 12 December 2021
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank CO #1	36	± 32	-18	± 0
	<u>Lab #1 (Figure 1)</u>				
3	Starboard benchtop	-19	± 42	9	± 12
4	Deck in center of lab	-6	± 24	-2	± 3
5	Port benchtop	14	± 25	7	± 10
6	Aft benchtop	-7	± 27	4	± 11
	<u>Hydro Lab (Figure 1)</u>				
7	Deck in front of starboard bench	6	± 26	-3	± 4
8	Deck inside port entrance	1	± 4	10	± 11
9	Forward benchtop	12	± 20	3	± 9
10	Starboard benchtop center section	33	± 30	-16	± 20
11	Aft sink area	-14	± 32	10	± 12
12	Aft bechtop	9	± 19	1	± 7
13	Port benchtop	1	± 5	-3	± 8
	<u>Chemistry Lab (Figure 1)</u>				
14	Deck at port entrance	7	± 11	13	± 11
15	Inside fume hood	-4	± 171	9	± 11
16	Starboard benchtop forward section	11	± 24	-1	± 8
17	Starboard benchtop aft section	16	± 21	4	± 8
18	Forward sink area	12	± 18	8	± 10
19	Deck n front of starboard benchtop	-3	± 11	-4	± 6
20	Aft sink area	-16	± 36	-2	± 19
21	Aft benchtop	-15	± 33	2	± 17
22	Forward benchtop	10	± 27	-4	± 5
23	Aft benchtop opposite sink	8	± 14	12	± 11
	<u>Wet Lab (Figure 1)</u>				
24	Forward sink area and adjacent benchtop	1	± 7	6	± 10
25	Deck in front of sink forward of CTD	16	± 19	10	± 10
26	Starboard benchtop	14	± 17	9	± 10
27	Forward benchtop	-7	± 29	-6	± 16

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Science Storeroom (Figure 1)</u>					
28	Inside Cospolich refrigerator #1	89	± 22	26	± 10
29	Inside Cospolich refrigerator #2	-1	± 6	-11	± 14
30	Inside Cospolich refrigerator #3	-16	± 36	13	± 11
31	Inside thermo -80oC freezer	-8	± 35	1	± 14
32	Final bucket blank CO #1	14	± 35	-13	± 17
33	Initial bucket blank CO #2	11	± 34	-10	± 13
<u>Lab #2 (Figure 1)</u>					
34	Benchtop opposite of port aft sink	7	± 15	8	± 10
35	Deck in center of port lab section	2	± 11	4	± 10
36	Forward benchtop in port lab section	10	± 79	-9	± 12
37	Port benchtop in port lab section	15	± 20	6	± 9
38	Starboard sink area and adjacent benchtop	0	± 3	5	± 10
39	Aft sink area port lab section	0	± 2	15	± 11
40	Port benchtop in starboard lab section	1	± 25	0	± 9
41	Forward benchtop in starboard lab section	19	± 25	-1	± 13
42	Deck between port and starboard sections	12	± 19	7	± 10
43	Aft sink area with bench in starboard lab	-20	± 45	-7	± 18
<u>OTG Rad Van, Ser#592.2.01 (Figure 2)</u>					
44	Inside refrigerator near entrance	204	± 43	16	± 7
45	Inside refrigerator near fume hood	396	± 57	25	± 7
46	Benchtop next to entrance	325	± 51	14	± 6
47	Benchtop next to fume hood	*8653	± 255	*116	± 7
48	Inside fume hood	487	± 69	12	± 4
49	Benchtop across from entrance	303	± 54	20	± 7
50	Deck inside entrance near fume hood	*2977	± 180	*304	± 21
51	Deck inside front entrance	714	± 81	45	± 9
52	Benchtop next to LSC	271	± 48	18	± 7
53	Final bucket blank CO #2	34	± 24	4	± 7

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 ^3H and ^{14}C contamination, and while no action is necessary we recommend cleaning the deck to help prevent tracking of ^3H out of the van.

Figure #2
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12 December 2021

