

UNIVERSITY OF MIAMI

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Tritium Laboratory  
18 January 2022

SWAB REPORT # 1023

SWAB DATE: 13 January 2022

*R/V F.G. Walton Smith*

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James D. Happell

Distribution:  
SWAB Committee  
Don Cucchiara  
Clay Dundas

## 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  $^3\text{H}$  &  $^{14}\text{C}$ . This replaces an LSC with background cpm of 1.6 & 5.5 for  $^3\text{H}$  &  $^{14}\text{C}$ .

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. All activities significantly above background will be in **bold**.

### 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 # 1023

LOCATION: Miami, FL  
VESSEL: *R/V F.G. Walton Smith*

DATE: 13 January 2022  
TECHNICIAN: Jim Happell

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
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	<b>43</b>	± <b>22</b>	<b>17</b>	± <b>10</b>
	<u>Main Lab (Figure 1)</u>				
3	Benchtop port of sink	8	± 20	1	± 8
4	Starboard side of center benchtop	0	± 1	<b>16</b>	± <b>12</b>
5	Starboard benchtop	8	± 23	0	± 3
6	Deck inside door to wet lab	23	± 23	2	± 7
7	Deck inside mess hall	16	± 20	<b>15</b>	± <b>11</b>
8	Deck inside forward starboard stairs	-17	± 141	<b>25</b>	± <b>14</b>
9	Deck inside forward port stairs	22	± 22	<b>31</b>	± <b>13</b>
10	Deck between starboard and center benchtop	-5	± 14	<b>28</b>	± <b>13</b>
11	Deck between port and center benchtop	0	± 0	5	± 11
12	Deck below sink	-26	± 69	<b>17</b>	± <b>13</b>
13	Port side of center benchtop	-8	± 22	5	± 12
14	Aft port benchtop	9	± 13	<b>17</b>	± <b>11</b>
15	Port benchtop	<b>10</b>	± <b>8</b>	<b>32</b>	± <b>12</b>
	<u>Wet Lab (Figure 1)</u>				
16	Inside Haier refrigerator bottom	17	± 25	-1	± 3
17	Inside Haier freezer top	17	± 31	-8	± 13
18	Deck between doors	36	± 27	-2	± 193
19	Benchtop port of forward sink	<b>25</b>	± <b>23</b>	7	± 10
20	Benchtop port of aft sink	3	± 10	8	± 11
21	Final bucket blank	18	± 28	<b>13</b>	± <b>12</b>

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 tested in the ship were free from isotope contamination that requires cleaning.

R/V F.G. Walton-Smith

Figure 1  
SWAB #1023  
13 January 2022

