

UNIVERSITY OF MIAMI

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Tritium Laboratory  
5 April 2024

SWAB REPORT #1085

SWAB DATE: 22 March 2024

*R/V Roger Revelle* and Radioisotope Van #2408-02

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James D. Happell

Distribution:  
SWAB Committee  
Gary Lain

## 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 institution promptly by phone or email.

REPORT FOR SWAB #1085

LOCATION: San Diego, CA  
VESSEL: *R/V Roger Revelle*

DATE: 22 March 2024  
TECHNICIAN: Charlene Grall

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	29 ±	20	8 ±	11
	<u>Main Lab (Figure 1)</u>				
3	Starboard sink area	25 ±	21	4 ±	9
4	Benchtop aft of starboard sink	31 ±	16	37 ±	14
5	Starboard bench forward of fume hood	-6 ±	33	19 ±	13
6	Forward center benchtop	8 ±	15	6 ±	12
7	Inside fume hood	26 ±	25	-7 ±	8
8	Top of freezer	16 ±	18	5 ±	11
9	Aft workbench	50 ±	24	13 ±	11
10	Deck inside aft entrance	9 ±	9	24 ±	13
11	Deck inside aft port entrance	28 ±	21	4 ±	9
12	Benchtop forward of starboard sink	-27 ±	26	14 ±	14
13	Forward starboard benchtop	-18 ±	21	8 ±	14
14	Deck inside port entrance	58 ±	26	8 ±	10
15	Port sink area	17 ±	12	35 ±	14
16	Deck below port sink	51 ±	24	9 ±	10
17	Deck inside forward port entrance	68 ±	28	-2 ±	12
	<u>Bio-Analytical Lab (Figure 1)</u>				
20	Benchtop starboard of forward sink	-2 ±	2	1 ±	14
21	Inside fume hood	15 ±	21	1 ±	7
22	Forward sink area	57 ±	28	-4 ±	11
23	Inside freezer	20 ±	21	1 ±	7
24	Deck at starboard entrance	86 ±	29	30 ±	12
25	Deck at aft entrance	44 ±	24	19 ±	12
26	Inside refrigerator	25 ±	19	14 ±	12
27	Aft sink area	26 ±	21	3 ±	9
28	Forward deck between benchtop and forward sink	91 ±	29	40 ±	13
29	Center benchtop	17 ±	16	12 ±	12
	<u>Miscellaneous Areas (Figure 1)</u>				
18	Deck of dark room	-1 ±	2	22 ±	13
19	Deck in center of science storage	17 ±	23	-4 ±	11
30	Deck inside walk-in refrigerator	-2 ±	2	-3 ±	4

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
31	Deck outside walk-in freezer	9 ±	28	1 ±	7
32	Deck of science freezer vestibule	-34 ±	35	7 ±	16
	<u>Hydro Lab (Figure 2)</u>				
33	Companionway between Hydro and Wet Labs	32 ±	19	<b>19</b> ±	<b>12</b>
34	Starboard sink area	<b>*979</b> ±	<b>81</b>	<b>*301</b> ±	<b>23</b>
35	Inside fume hood	26 ±	17	<b>22</b> ±	<b>13</b>
36	Forward deck in front of sink and fume hood	408 ±	57	<b>43</b> ±	<b>11</b>
37	Benchtop aft of starboard sink	<b>*934</b> ±	<b>83</b>	<b>44</b> ±	<b>8</b>
38	Inside Cospolich refrigerator	2 ±	1	<b>*78</b> ±	<b>17</b>
39	Port benchtop	<b>86</b> ±	<b>39</b>	10 ±	10
40	Benchtop across from starboard sink	<b>50</b> ±	<b>25</b>	7 ±	9
41	Intermediate bucket blank	15 ±	16	10 ±	12
42	Deck aft of aft port sink near aft entrance	<b>362</b> ±	<b>54</b>	<b>31</b> ±	<b>10</b>
43	Aft port sink area	<b>39</b> ±	<b>22</b>	9 ±	11
44	Deck inside starboard entrance	<b>130</b> ±	<b>34</b>	<b>39</b> ±	<b>13</b>
45	Lab bench perpendicular to port sink	<b>44</b> ±	<b>23</b>	10 ±	11
	<u>Wet Lab (Figure 2)</u>				
46	Sink area	<b>38</b> ±	<b>23</b>	7 ±	10
47	Inside fume hood	0 ±	1	<b>19</b> ±	<b>13</b>
48	Deck at port entrance	<b>38</b> ±	<b>23</b>	<b>20</b> ±	<b>12</b>
49	Starboard benchtop aft of sink	9 ±	14	9 ±	12
50	Deck at aft entrance	<b>55</b> ±	<b>26</b>	<b>27</b> ±	<b>13</b>
51	Forward benchtop	-6 ±	10	9 ±	13
52	Deck of staging bay	<b>21</b> ±	<b>17</b>	<b>16</b> ±	<b>12</b>
	<u>Radioisotope Van #2408-02 (Figure 3)</u>				
53	Inside fume hood	<b>85</b> ±	<b>8</b>	<b>*1633</b> ±	<b>54</b>
54	Benchtop with LSC	<b>*230</b> ±	<b>120</b>	<b>*970</b> ±	<b>40</b>
55	Benchtop across from sink	<b>261</b> ±	<b>27</b>	<b>*926</b> ±	<b>41</b>
56	Inside refrigerator	-39236 ±	272	<b>***403186</b> ±	<b>847</b>
57	Inside freezer	<b>*3969</b> ±	<b>154</b>	<b>*1772</b> ±	<b>53</b>
58	Deck in front of fume hood	<b>*9195</b> ±	<b>225</b>	<b>*7413</b> ±	<b>110</b>
59	Benchtop adjacent to sink	<b>715*</b> ±	<b>52</b>	<b>*1431</b> ±	<b>50</b>
60	Benchtop across from sink	<b>**19994</b> ±	<b>374</b>	<b>*1498</b> ±	<b>40</b>
61	Sink area	<b>287</b> ±	<b>26</b>	<b>*1302</b> ±	<b>48</b>
62	Deck inside of van entrance	<b>*6150</b> ±	<b>200</b>	<b>*3673</b> ±	<b>77</b>
63	Deck between refrigerator and freezer	<b>**44378</b> ±	<b>13155</b>	<b>**13155</b> ±	<b>143</b>
64	Final bucket blank	0 ±	11	13 ±	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. In the Hydro Lab was some  $^3\text{H}$  contamination around the starboard sink as well as the benchtop aft of the same sink. There was also  $^{14}\text{C}$  contamination found around the same starboard sink, as well as a minor amount in the Cospolich refrigerator. This lab needs cleaning before any background  $^{14}\text{C}$  work is performed. The radioisotope van had considerable  $^3\text{H}$  and  $^{14}\text{C}$  contamination in the refrigerator and on the deck below. Members of the CalCOFI team and Scripps personnel decontaminated the van and performed repeated wipe tests to ensure levels in the van were below the limit where further action needs to be taken.

# R/V ROGER REVELLE

Figure 1  
SWAB 1085  
20 March 2024

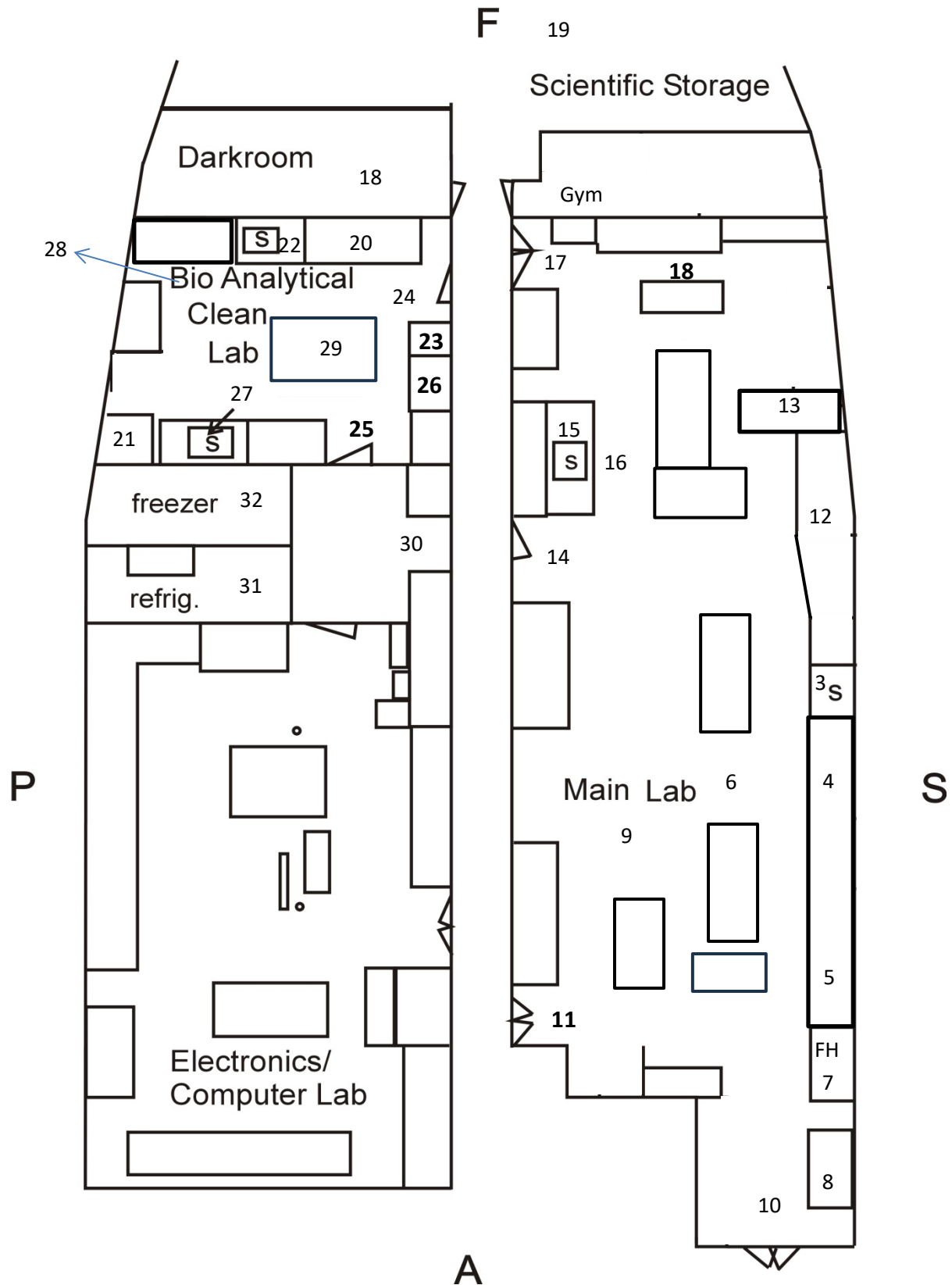
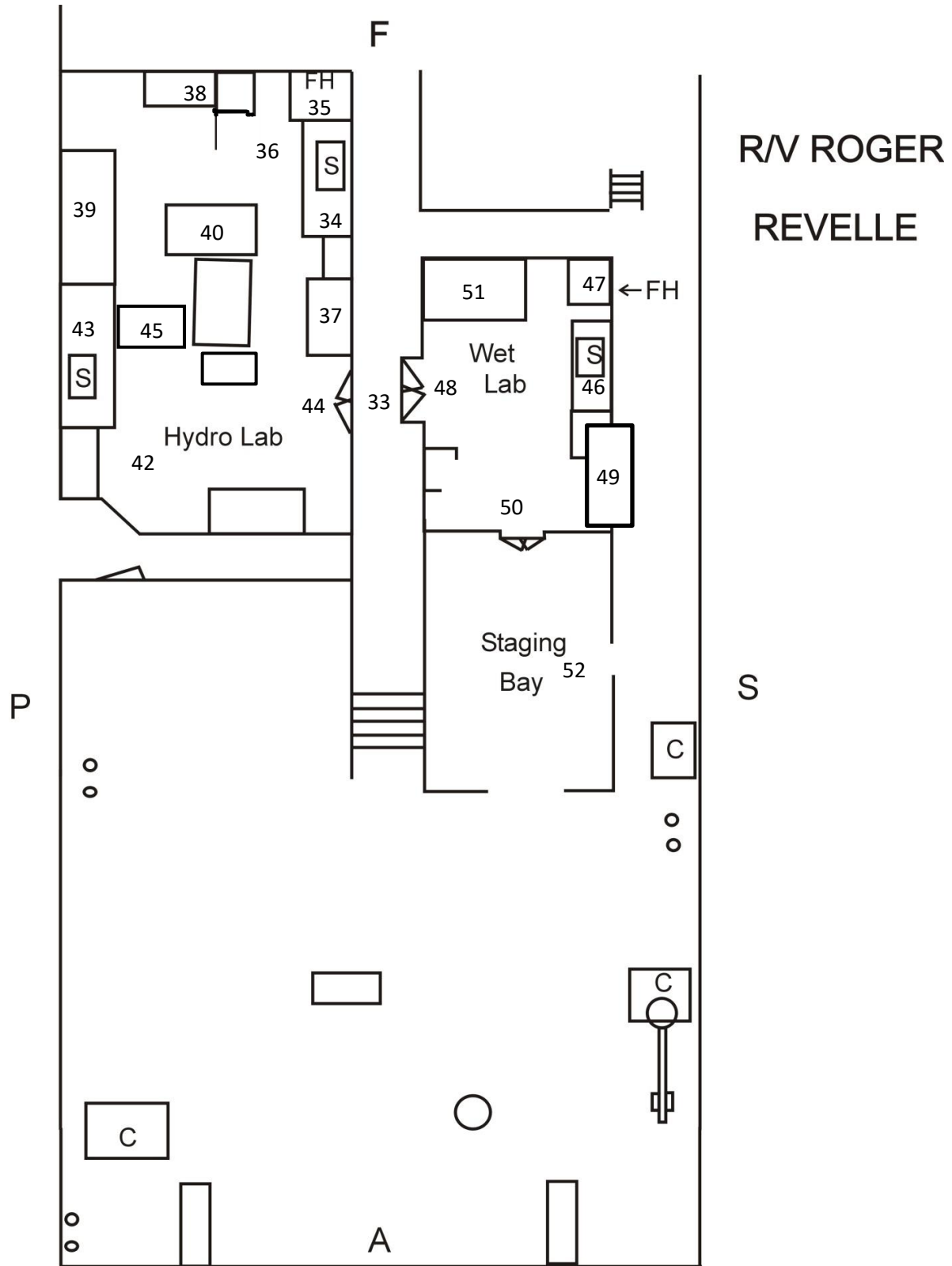


Figure 2  
SWAB 1085  
20 March 2024



Rad Van #2408-02

Figure 3  
SWAB #1085  
20 March 2024

