

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory
28 February 2023

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SWAB REPORT # 1055

SWAB DATE: 21 February 2023

R/V Thomas Thompson & Van #625.1.05 "R5"

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Loren Tuttle

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 institution promptly by phone or email.

REPORT FOR SWAB #1055

LOCATION: Honolulu, HI
VESSEL: *R/V Thomas Thompson*

DATE: 21 February 2023
TECHNICIAN: Yudy Mendoza

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	-8	± 26	15	± 13
	<u>Main Lab (Figure 1)</u>				
3	Port sink area	44	± 22	15	± 11
4	Deck in front of GE refrigerator	11	± 17	6	± 11
5	Starboard sink area	7	± 11	14	± 12
6	Inside fume hood	7	± 31	-5	± 10
7	Inside aft entrance	20	± 20	5	± 10
8	Deck at port entrance	6	± 12	9	± 12
9	Deck inside mid-port entrance	36	± 24	0	± 0
10	Deck inside forward port entrance	-9	± 29	0	± 1
	<u>BioAnalytical Lab (Figure 2)</u>				
11	Benchtop adjacent to sink	13	± 20	16	± 13
12	Aft sink area	10	± 17	4	± 11
13	Inside fume hood	44	± 28	-10	± 14
14	Center section of starboard benchtop	4	± 13	4	± 12
15	Inside aft refrigerator	26	± 26	-9	± 16
16	Inside aft freezer	-6	± 19	-4	± 8
17	Forward sink area	6	± 67	-9	± 16
18	Forward benchtop adjacent to sink	4	± 10	9	± 12
19	Forward section of center benchtop	13	± 14	14	± 12
20	Aft section of center benchtop	-19	± 25	3	± 17
21	Deck inside starboard entrance	4	± 18	0	± 7
22	Deck inside aft entrance	10	± 15	7	± 12
23	Deck between sink and fume hood	11	± 16	8	± 12
	<u>Computer Lab (Figure 3)</u>				
24	Deck inside forward entrance	12	± 18	4	± 11
25	Deck inside starboard entrance	-13	± 19	9	± 13
	<u>Hydro Lab (Figure 4)</u>				
26	Center benchtop	3	± 14	2	± 11
27	Deck inside aft entrance	19	± 24	-4	± 7
28	Port sink area	24	± 18	13	± 12
29	Deck inside starboard entrance	9	± 31	-7	± 13
30	Deck in front of port sink	25	± 22	2	± 8

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Wet Lab (Figure 5)</u>					
31	Aft starboard benchtop	-13	± 19	15	± 13
32	Forward benchtop	37	± 25	5	± 9
33	Deck in center of Lab	11	± 18	3	± 10
34	Deck outside port entrance	20	± 22	-1	± 21
<u>Main Deck (Figure 6)</u>					
35	Port side of the aft deck where Rad Van stood	-5	± 22	8	± 13
36	Companionway outside aft head	-6	± 26	-11	± 16
37	Deck inside Science Office	8	± 21	-2	± 4
38	Deck outside Scientific freezer	3	± 11	6	± 12
39	Intermediate bucket blank	-8	± 28	-7	± 15
<u>Rad Van #625.1.05 "R5" (Figure 7)</u>					
40	Sink area	19	± 16	16	± 12
41	Benchtop adjacent to sink	2	± 12	3	± 12
42	Benchtop adjacent to fume hood	16	± 14	20	± 13
43	Inside fume hood	37	± 23	5	± 9
44	Inside freezer	-10	± 25	36	± 14
45	Inside refrigerator	53	± 22	27	± 12
46	Benchtop adjacent to LSC across from fume hood	27	± 16	31	± 13
47	Benchtop across from sink	10	± 17	3	± 11
48	Deck between fume hood and LSC	20	± 16	18	± 12
49	Deck in front of freezer	37	± 20	20	± 12
50	Deck in front of refrigerator	27	± 18	20	± 12
51	Final bucket blank	-4	± 14	1	± 19

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 and the Rad van were free from isotope contamination requiring cleaning.

Main Lab Layout

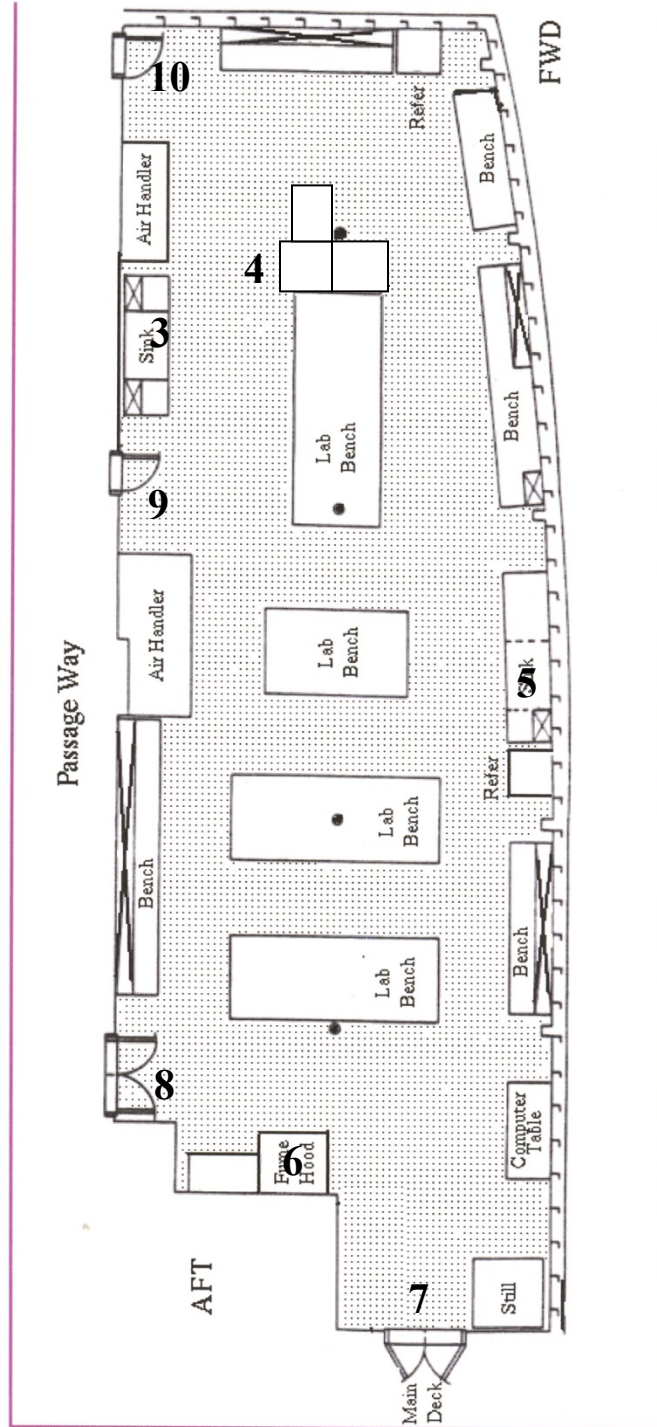


Figure 1
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Figure 2
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BioAnalytical Lab Layout

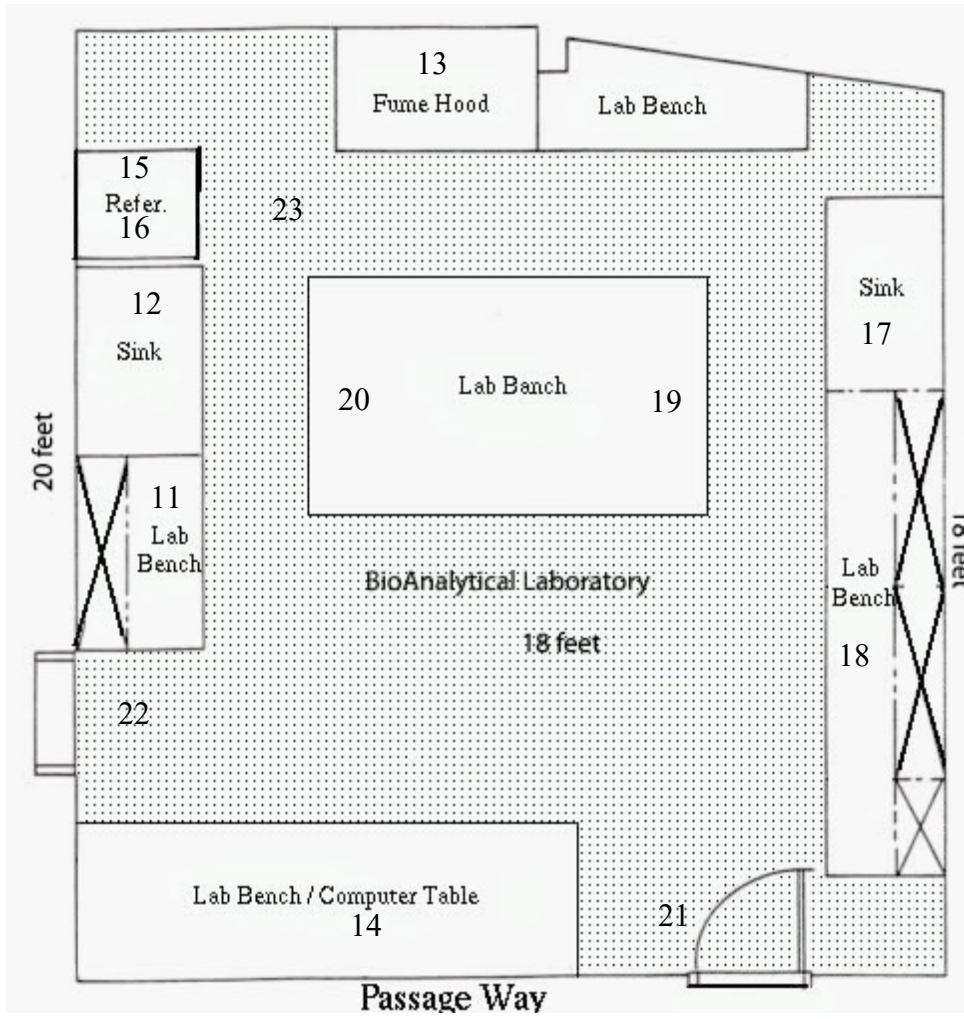
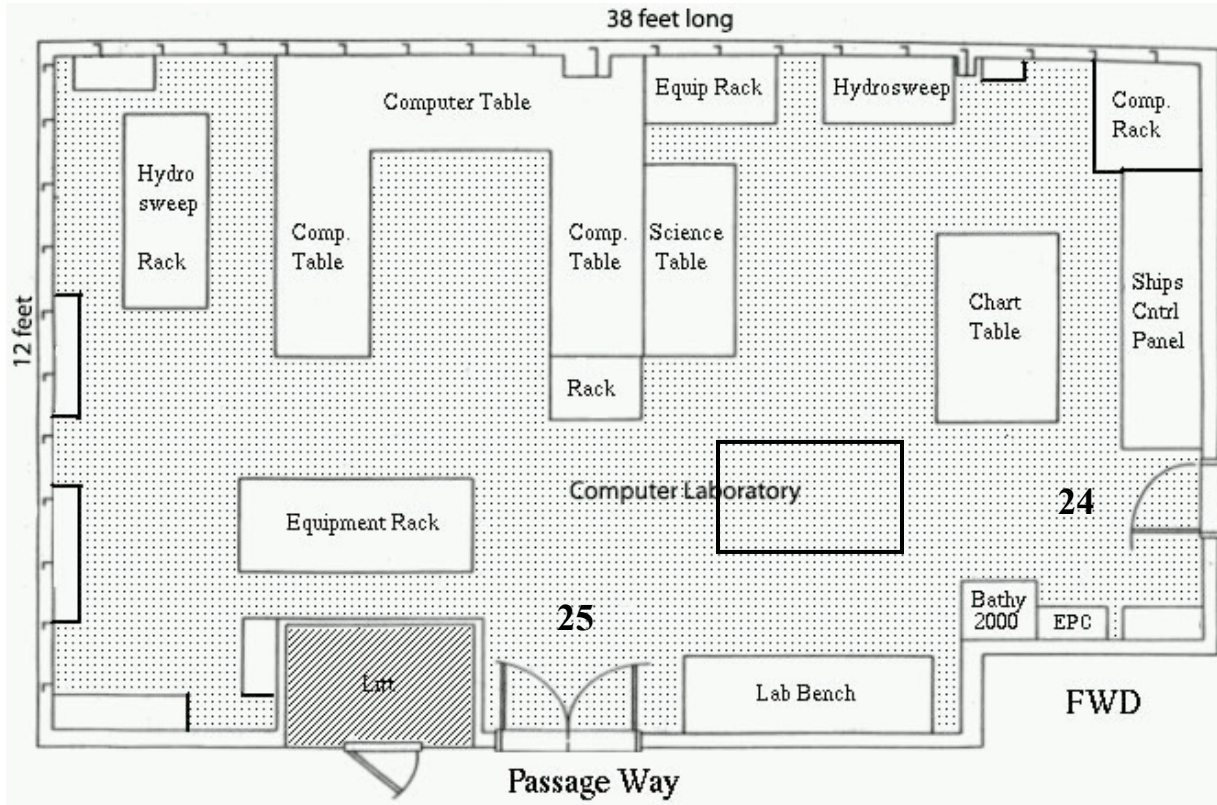


Figure 3
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Computer Lab Layout



Note: Lab configuration has changed for this report. Computer tables and equipment racks were moved.

Figure 4
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Hydro Lab Layout

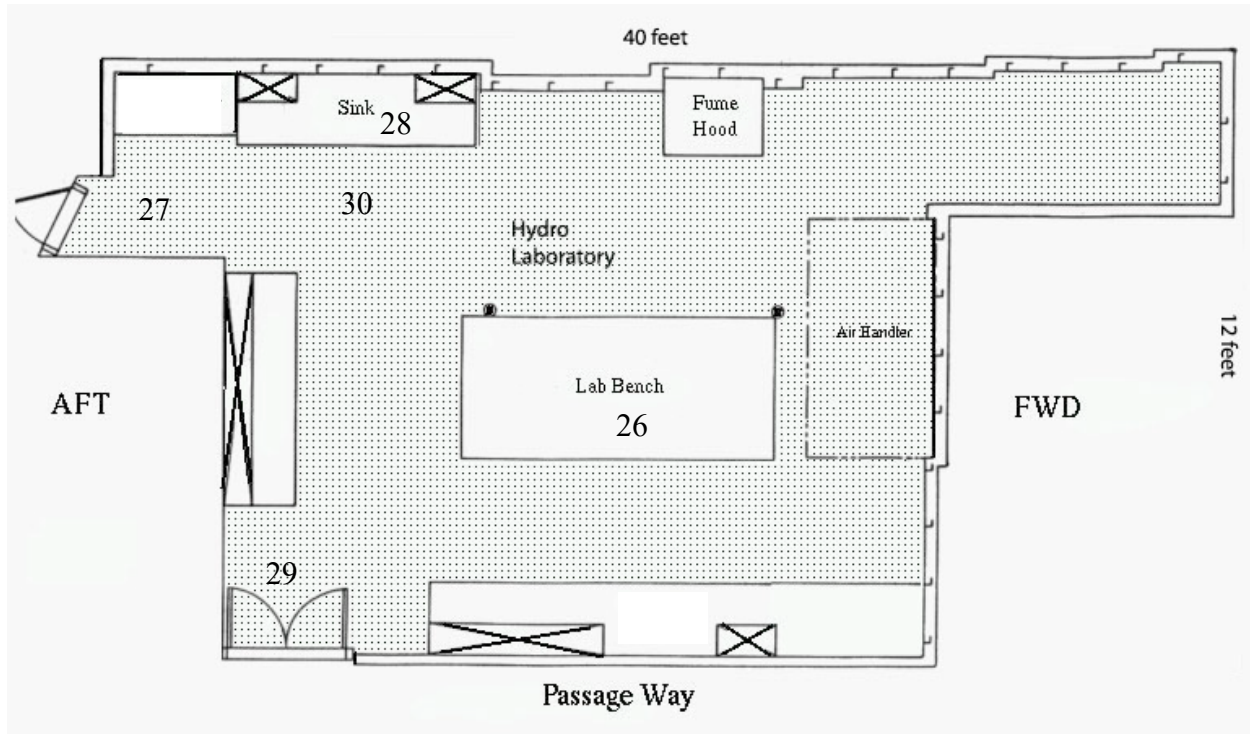
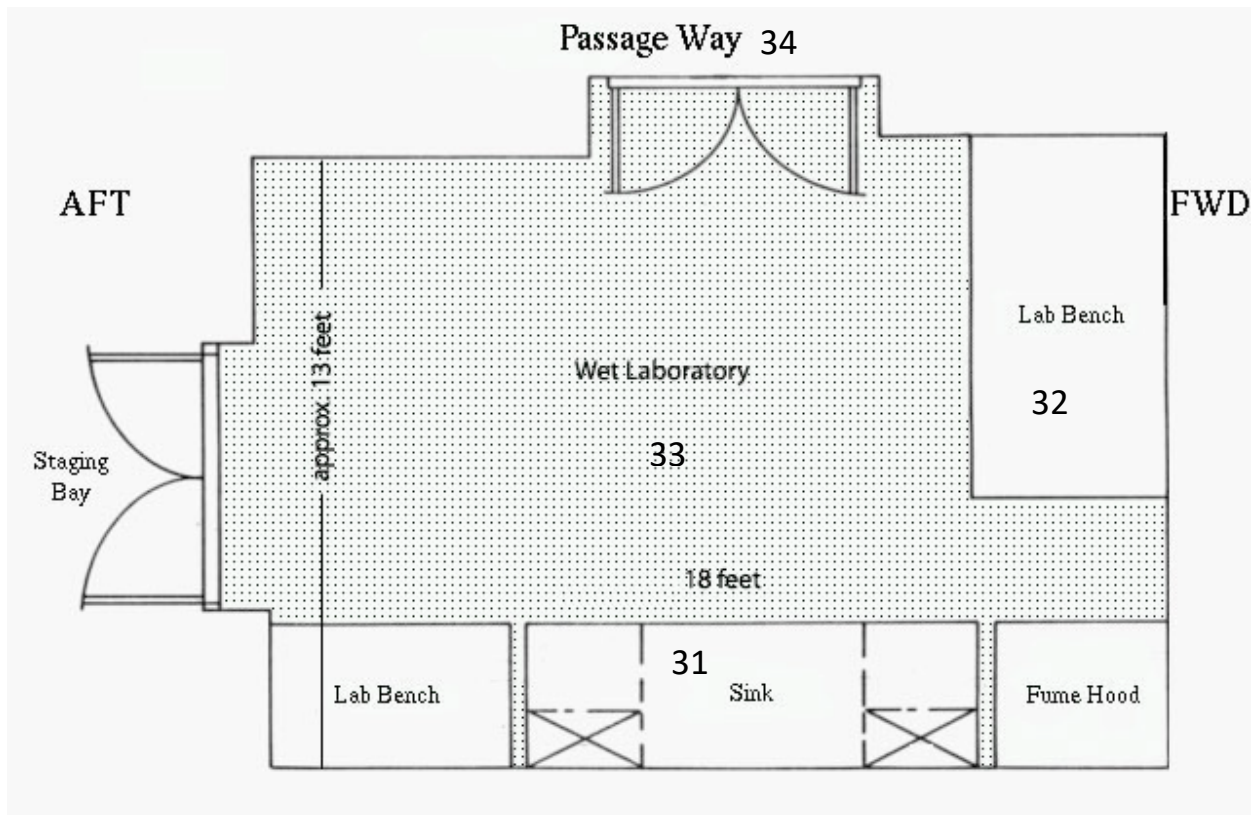


Figure 5
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Rad Van #625.1.05 "R5"

Figure 7
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