

UNIVERSITY OF MIAMI  
ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



Tritium Laboratory  
26 February 2018

Tritium Laboratory  
4600 Rickenbacker Causeway  
Miami, Florida 33149-1031

Ph: 305-421-4100  
Fax: 305-421-4112  
E-mail: Tritium@rsmas.miami.edu

SWAB REPORT # 886

SWAB DATE: 20 February 2018

*R/V Atlantic Explorer*

---

Dr. James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Ronald H. Harelstad  
Rod Johnson  
Nick Mathews

## COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

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.

### 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 # 886

LOCATION: St. George, Bermuda  
VESSEL: *R/V Atlantic Explorer*

DATE: 20 February 2018  
TECHNICIAN: Jim Happell

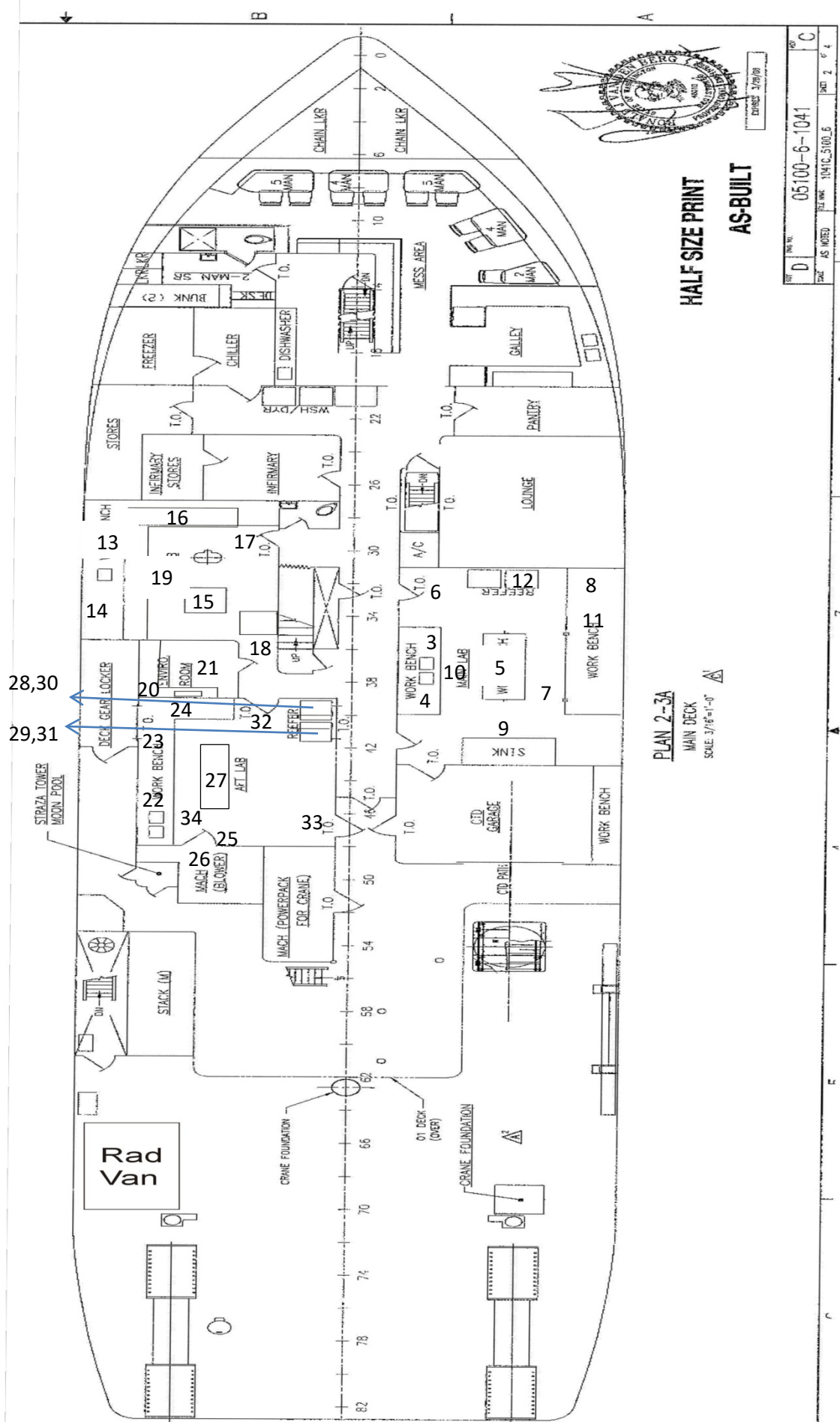
Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>			<sup>14</sup> C dpm/m <sup>2</sup>		
		activity	±	error	activity	±	error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	15	±	81	-13	±	23
	<u>Main Lab (Figure 1)</u>						
3	Port sink area	-24	±	84	-5	±	10
4	Benchtop aft of sink	-27	±	94	22	±	39
5	Center benchtop	-25	±	87	9	±	43
6	Deck inside forward entrance	125	±	58	-6	±	599
7	Deck between center and starboard benchtops	23	±	50	1	±	19
8	Forward starboard benchtop	-31	±	107	-8	±	14
9	Deck in front of CTD bottle rack on aft bulkhead	-20	±	71	27	±	39
10	Deck in front of port sink	5	±	25	11	±	36
11	Inside fume hood	-8	±	29	-10	±	18
12	Inside forward starboard freezer	-9	±	31	-17	±	31
	<u>Forward Lab (Figure 1)</u>						
13	Port sink area	-33	±	115	28	±	40
14	Benchtop aft of sink	7	±	23	-15	±	27
15	Center benchtop	-11	±	39	0	±	0
16	Forward benchtop	-32	±	111	2	±	3
17	Deck at forward entrance	8	±	45	2	±	29
18	Deck at aft entrance	46	±	44	18	±	32
19	Deck in front of port sink	53	±	47	15	±	31
20	Benchtop inside Enviro Room	-3	±	17	-7	±	12
21	Deck in Enviro Room	115	±	56	7	±	19

Sample #	Sample Identification	$^3\text{H}$ dpm/m <sup>2</sup>		$^{14}\text{C}$ dpm/m <sup>2</sup>	
		activity	error	activity	error
<u>Aft Lab (Figure 1)</u>					
22	Port sink area	-39	± 135	2	± 3
23	Benchtop forward of sink	-13	± 47	-11	± 20
24	Forward benchtop	-31	± 106	-24	± 43
25	Center benchtop	-13	± 45	-9	± 16
26	Inside fume hood	*1976	± 140	*172	± 78
27	Deck in front of fume hood	-4	± 194	10	± 37
28	Inside aft Cospolich refrigerator	-46	± 159	4	± 87
29	Inside forward Cospolich refrigerator	-29	± 101	-3	± 6
30	Inside aft Cospolich freezer	-16	± 55	6	± 42
31	Inside forward Cospolich freezer	-15	± 51	6	± 41
32	Deck inside forward entrance	-3	± 10	-9	± 16
33	Deck inside aft entrance	-111	± 385	-1	± 1
34	Deck in front of port sink	16	± 55	-2	± 3
35	Intermediate bucket blank	-44	± 155	-10	± 18
<u>Radioisotope Van 2409-01 (Figure 2)</u>					
36	Sink area	*868	± 92	15	± 9
37	Benchtop across from sink	*8660	± 249	*210	± 17
38	Inside fume hood	*8749	± 251	*231	± 19
39	Top of LSC	*5199	± 196	*124	± 15
40	Inside Danby refrigerator under sink	*7492	± 223	*1682	± 68
41	Deck between LSC and hood	**29170	± 441	*473	± 19
42	Deck at entrance	***169337	± 1101	*2813	± 44
43	Deck outside van entrance on 01 Deck	*1673	± 119	30	± 10
44	Final bucket blank	-29	± 161	-2	± 3

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When 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. All areas tested on the ship were free from any isotope contamination that requires cleaning, except for the fume hood in the Aft lab which had minor  $^3\text{H}$  and  $^{14}\text{C}$  contamination. This fume hood should be cleaned ASAP. Minor  $^{14}\text{C}$  and minor to major  $^3\text{H}$  contamination was found in the Rad Van. The deck of the rad van needs to be cleaned ASAP. Tritium was also found on the deck of the ship outside the rad van door. This area also needs to be cleaned ASAP.

Figure 1  
 SWAB #886  
 20 February 2018



UNOLS Shared Use Van 2409-01

