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Tritium Laboratory
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SWAB REPORT # 965

SWAB DATE: 27 October 2019

R/V Atlantic Explorer

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Distribution:
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COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for ^3H and ^{14}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 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.

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 $1000 \text{ dpm}/\text{m}^2$ 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}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 # 965

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

DATE: 27 November 2019
TECHNICIAN: Anthony Burke

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	42	± 55	-17	± 20
<u>Forward Lab (Figure 1)</u>				
3 Port benchtop forward of sink	36	± 56	-15	± 17
4 Sink area	42	± 58	-20	± 23
5 Deck in front of sink	33	± 58	-16	± 18
6 Forward benchtop	33	± 53	-11	± 13
7 Deck inside starboard entrance	25	± 43	2	± 24
8 Center benchtop	41	± 42	8	± 30
9 Deck inside Enviro Room	20	± 53	-7	± 27
<u>Aft Lab (Figure 1)</u>				
10 Port sink area	52	± 56	-19	± 23
11 Benchtop forward of sink	25	± 75	-23	± 26
12 Inside fume hood	39	± 51	-9	± 34
13 Deck in front of fume hood	41	± 55	-15	± 18
14 Deck inside forward entrance	46	± 57	-19	± 22
15 Inside aft entrance	2	± 6	-3	± 13
16 Deck below -80 °C freezer	25	± 43	3	± 25
17 Center benchtop	44	± 50	-7	± 28
<u>Main Lab (Figure 1)</u>				
18 Port sink area	33	± 66	-22	± 26
19 Deck in front of sink	65	± 55	-19	± 22
20 Benchtop aft of sink	42	± 52	-10	± 38
21 Inside laminar flow hood	74	± 51	-9	± 34
22 Deck in front of laminar flow hood	40	± 51	-8	± 31
23 Deck inside forward entrance	28	± 45	0	± 1
24 Deck below CTD racks	61	± 78	-51	± 60
25 Deck inside aft entrance	80	± 52	-8	± 32
26 Center benchtop	16	± 58	-8	± 30
<u>Aft Deck (Figure 1)</u>				
27 Deck at bottom of stairs to 01 Deck	28	± 40	9	± 33

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
	<u>01 Deck (Figure 2)</u>				
28	Deck outside aft entrance from sleeping quarters	36	± 68	-25	± 29
29	Deck at top of aft stairs	21	± 132	-29	± 34
30	Deck outside Rad Van door	55	± 50	-2	± 80
	<u>02 Deck (Figure 2)</u>				
31	Top of stairs to science study	56	± 81	-49	± 57
32	Deck inside aft entrance next to head	49	± 58	-19	± 23
	<u>03 Deck (Figure 3)</u>				
33	Top of stairs to bridge	47	± 105	-55	± 64
34	Intermediate bucket blank	29	± 63	-19	± 22
	<u>Radiation Van #625.5.02 (Figure 4)</u>				
35	Sink area	155	± 53	-4	± 37
36	Benchtop adjacent to sink	*2887	± 152	6	± 22
37	Benchtop adjacent to fume hood	*818	± 89	-10	± 12
38	Deck between LSC and fume hood	236	± 60	11	± 18
39	Top of LSC	*820	± 87	*67	± 26
40	Benchtop adjacent to LSC	74	± 56	-25	± 29
41	Inside freezer	40	± 51	-9	± 33
42	Inside refrigerator	*901	± 87	*183	± 36
43	Deck in middle of van	487	± 85	-10	± 26
44	Benchtop across from sink	107	± 55	-21	± 25
45	Deck inside entrance	205	± 60	-18	± 21
50	Final bucket blank	6	± 19	-29	± 33

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 isotope contamination that requires cleaning, There was some minor ^3H and ^{14}C contamination in the van. No action is necessary in the van.