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Tritium Laboratory
8 October 2016

SWAB REPORT # 830

SWAB DATE: 1 October 2016

R/V Blue Heron

James Happell

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Distribution:
SWAB Committee
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COMMENTS TO SWAB REPORTS 12 May 2014

Typical LSC instrument background values for ^{3}H 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	^{3}H (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 Proceedure

Wearing ordinary household rubber gloves:

^{3}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}C: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}CO_2$). Follow up with wash as if for ^{3}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 # 830

LOCATION: Duluth, MN
VESSEL: *R/V Blue Heron*

DATE: 1 October 2016
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	37	±	45	2	±	16
	Wet Lab (Figure 1)						
3	Deck inside aft entrance	10	±	36	5	±	34
4	Port sink area	40	±	54	-13	±	26
5	Benchtop across from Damage Control Locker	22	±	93	-24	±	44
6	Deck below Tech Station	30	±	43	10	±	33
7	Starboard sink area	59	±	49	-3	±	206
8	Deck in front of benchtop	-27	±	41	4	±	62
9	Inside refrigerator	59	±	48	5	±	23
10	Inside freezer	8	±	26	13	±	36
11	Deck at top of stair to Dry Lab	1	±	51	-8	±	18
	Galley/ Mess Deck (Figure 1)						
12	Companionway between head and Pilot House stair	38	±	56	-15	±	22
13	Deck in front of galley refrigerator	42	±	60	-19	±	28
14	Companionway in front of forward berths	9	±	28	11	±	36
15	Deck beside dining table	39	±	77	-34	±	55
16	Inside fume hood	16	±	85	-17	±	46
17	Starboard benchtop	13	±	32	12	±	35
18	Sink area	21	±	57	-11	±	33
19	Benchtop port of sink	45	±	52	-11	±	34
20	Deck below sink area	65	±	51	-8	±	19
21	Deck below chest freezer	25	±	60	-14	±	21
22	Port benchtop	39	±	47	-1	±	19

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
	Miscellaneous areas (Figure 1,3)						
23	Main deck where Rad Van door opened	17	±	46	3	±	30
24	Deck inside pilot house	28	±	38	15	±	34
	UMN Radioisotope Van (Figure 4)						
25	Inside fume hood	11	±	22	25	±	37
26	Benchtop adjacent to LSC	156	±	46	*81	±	36
27	Sink area	49	±	38	35	±	36
28	Inside refrigerator near single door	65	±	37	49	±	36
29	Inside refrigerator next to LSC	338	±	53	*242	±	43
30	Deck in front of LSC	89	±	34	*114	±	40
31	Deck inside single door entrance	81	±	34	*104	±	39
32	Final bucket blank	26	±	33	23	±	36

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 cleani cleaning. Minor ^{14}C contamination was found in the rad van, but no action is necessary.