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28 December 2011

SWAB REPORT # 612

SWAB DATE: 17 December 2011

*R/V Hugh Sharp* and Van

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James D. Happell

Distribution:  
SWAB Committee  
Tim Deering

## COMMENTS TO SWAB REPORTS

23 November 2010

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 dispose in radiation waste system.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email.

REPORT FOR SWAB # 612

LOCATION: Lewes, Delaware  
VESSEL/LAB: *Hugh Sarp and Van*

DATE: 17 December 2011  
TECHNICIAN: Cecilia Roig

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 C.O. # 1	4	± 34	4	± 34
<u>Main Lab (see Figure 1)</u>					
3	Inside Whirlpool freezer top	0	± 0	2	± 64
4	Inside Whirlpool fridge bottom	16	± 54	0	± 0
5	Inside Holiday freezer	0	± 0	0	± 0
6	Inside Thermo freezer	181	± 60	2	± 6
7	Bench top across Thermo freezer	33	± 50	3	± 23
8	Benchtop forward of sink	0	± 0	20	± 39
9	Aft starboard bench top	21	± 70	0	± 0
10	Deck inside aft entrance	0	± 0	24	± 37
<u>Wet Lab (see Figure 1)</u>					
11	Inside Holiday freezer	2	± 12	13	± 36
12	Inside freezer top	19	± 55	0	± 0
13	Inside refrigerator bottom	0	± 0	0	± 0
14	Inside Frigidaire freezer top	0	± 0	4	± 40
15	Inside Frigidaire refridgerator bottom	0	± 0	2	± 40
16	Starboard sink area	5	± 25	10	± 35
17	Aft sink area	6	± 75	0	± 0
18	Forward starboard bench top	16	± 88	0	± 0
19	Deck in vestibule	26	± 66	0	± 0
20	Intermediate bucket blank	0	± 0	0	± 0
<u>University of Delaware Radiation Van (see Figure 2)</u>					
21	Inside fume hood	46	± 46	13	± 31
22	Bench top above fridge	*1252	± 106	20	± 9
23	Sink area	*4226	± 177	*175	± 21
24	Bench top above freezer	381	± 71	25	± 20
25	Bench top across from refridgeraor	238	± 67	0	± 0
26	Bench top across from LSC	137	± 56	10	± 20
27	Deck inside entrance close to sink	**10021	± 266	*317	± 22
28	Inside freezer	439	± 74	5	± 6
29	Inside refridgerator	**13811	± 315	*358	± 22
30	Deck center of van	**11716	± 289	*260	± 18
31	Deck inside entrance next to hood	*3202	± 166	*106	± 18
32	Final bucket blank C.O. # 1	0	± 0	0	± 0

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. All areas tested on the R/V Hugh R. Sharp were free of radioisotope contamination that requires cleaning. However sample 6 inside the Thermo freezer had above background  $^3\text{H}$  suggesting that  $^3\text{H}$  has been transported from the rad van into the freezer. Minor  $^{14}\text{C}$  and minor to moderate  $^3\text{H}$  contamination was found inside the Rad Van on the deck, benches, and inside the refrigerator. The deck and refrigerator need to be cleaned before any additional use.