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Tritium Laboratory  
12 September 2014

SWAB REPORT #738

SWAB DATE: 2 September 2014

*R/V Hugh Sharp*

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Distribution:  
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## 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	$^3\text{H}$ (dpm/ $\text{m}^2$ )	$^{14}\text{C}$ (dpm $\text{m}^2$ )	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 institution promptly by phone or email.

REPORT FOR SWAB # 738

LOCATION: Lewes, DE  
VESSEL: *R/V Hugh Sharp*

DATE: 2 September 2014  
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
<u>General Purpose Van (Figure 1)</u>					
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank C.O. # 1	18	± 73	0	± 0
3	Starboard benchtop left of sink	+652	± 70	+378	± 45
4	Starboard benchtop right of fume hood	+108	± 48	16	± 26
5	Inside fume hood	31	± 49	0	± 0
6	Port benchtop opposite of fume hood	+619	± 68	+352	± 44
7	Port benchtop center	55	± 39	26	± 32
8	Port benchtop opposite of sink	70	± 61	0	± 0
9	Inside freezer	43	± 43	6	± 26
10	Inside refrigerator	48	± 59	0	± 0
11	Sink area	28	± 37	14	± 32
12	Deck in front of sink at forward entrance	+7407	± 204	+5248	± 122
13	Deck center of van	+18054	± 329	+12489	± 185
14	Deck in front of fume hood aft entrance	+31338	± 426	+22040	± 245
<u>Main Lab (Figure 2)</u>					
15	Inside whirlpool freezer top	50	± 51	0	± 0
16	Inside whirlpool refrigerator bottom	43	± 55	0	± 0
17	Inside Holiday freezer	47	± 50	0	± 0
18	Top of Thermo freezer	39	± 58	0	± 0
19	Port benchtop across from freezers	31	± 56	0	± 0
20	Port benchtop across from whirlpool	12	± 61	0	± 0
21	Forward starboard benchtop	27	± 63	0	± 0
22	Center starboard benchtop	39	± 50	0	± 0
23	Aft starboard benchtop	40	± 63	0	± 0
24	Aft benchtop across from spill control sta	41	± 52	0	± 0
25	Aft benchtop across from sink	30	± 61	0	± 0
26	Sink area	73	± 55	0	± 0
27	Deck below sink	+525	± 65	+308	± 43
28	Deck at entrance to Wet Lab	+202	± 50	+81	± 34
29	Deck in front of freezers	+297	± 53	+230	± 41
30	Deck between forward & aft port bench	+85	± 40	+55	± 35
31	Deck between starboard & port bench	+287	± 58	+217	± 40
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
<u>Wet Lab (Figure 2)</u>					
32	Final bucket blank C.O. # 1	14	± 105	0	± 0
33	Initial bucket blank C.O. # 2	40	± 66	0	± 0
34	Forward starboard benchtop next to CTD	50	± 59	0	± 0
35	Deck at aft entrance	60	± 40	28	± 32
36	Deck below aft sink	45	± 48	0	± 0
37	Aft benchtops	12	± 117	0	± 0
38	Inside Whirpool freezer	68	± 51	0	± 0
39	Inside Whirpool fridge	54	± 50	0	± 0
<u>Rad Van, UNOLS 2408.04 (Figure 3)</u>					
40	Inside fume hood	71	± 57	0	± 0
41	Benchtop adjacent to fume hood	34	± 36	20	± 33
42	Benchtop adjacent to sink	116	± 49	10	± 21
43	Benchtop next to LSC	24	± 50	0	± 0
44	Benchtop opposite of sink	46	± 52	0	± 0
45	Inside freezer	55	± 43	16	± 30
46	Inside refrigerator	*1195	± 96	*338	± 41
47	Deck at aft entrance in front of fume hood	318	± 56	*153	± 37
48	Sink area	50	± 52	0	± 0
49	Deck in front of sink inside fwd entrance	268	± 58	*66	± 31
50	Final bucket blank C.O. # 2	28	± 54	0	± 0

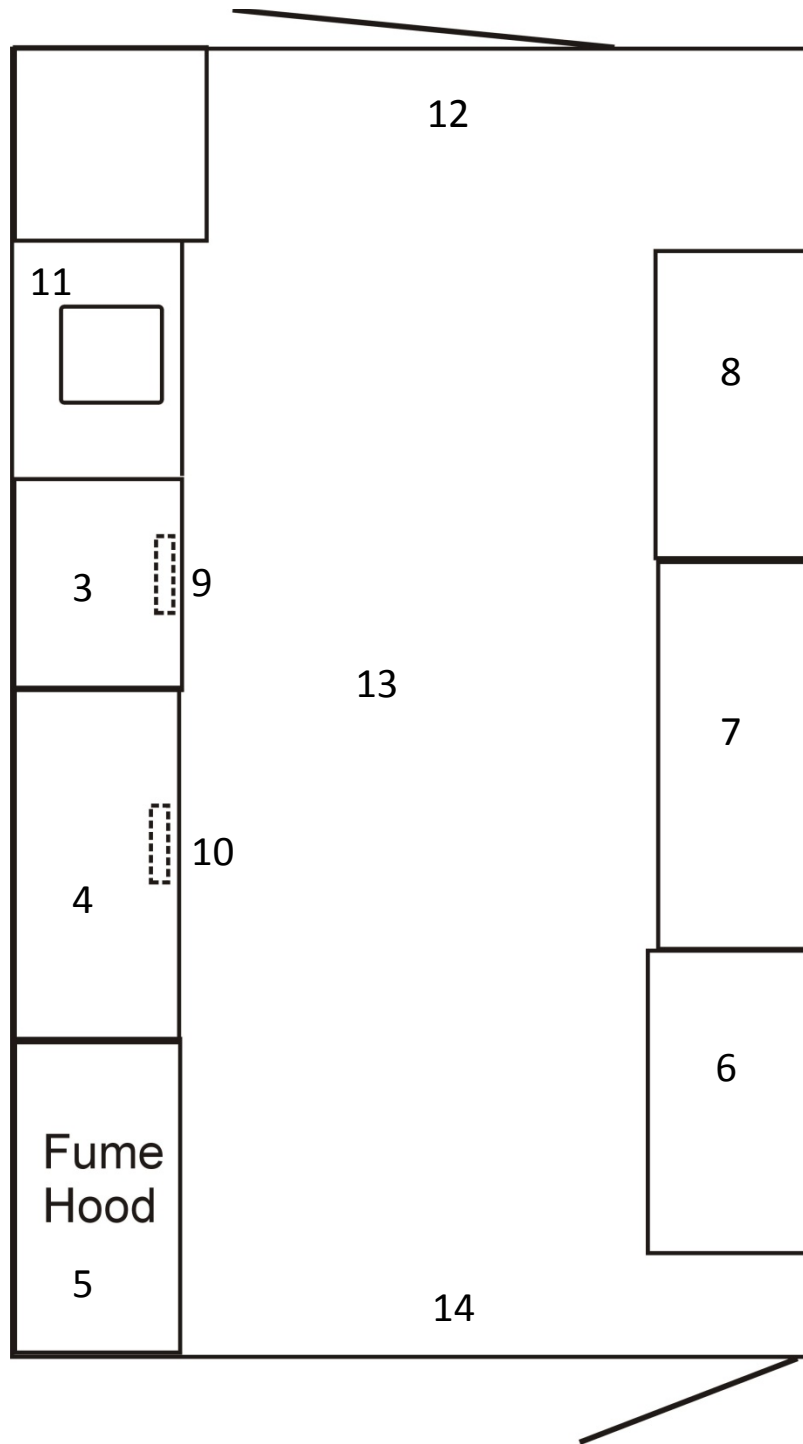
### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error.

<sup>+</sup>These numbers are either above the cleanup limits or above background, however it is believed that they are false positive results due to the presense of something that was used in the general purpose van and then probably tracked throughout the ship. Because the LSC ultimately measures light compounds that cause chemilumenescence can produce false positive results. Similar patterns were observed in SWAB 718 and were attributed to DAPI dye, but that dye was not used in the General Purpose Van. We are trying to track down the compond responsible for the false positive. Cleaning between SWAB 718 and this SWAB appears to have helped some. However more cleaning is needed to prevent false positives in the future.

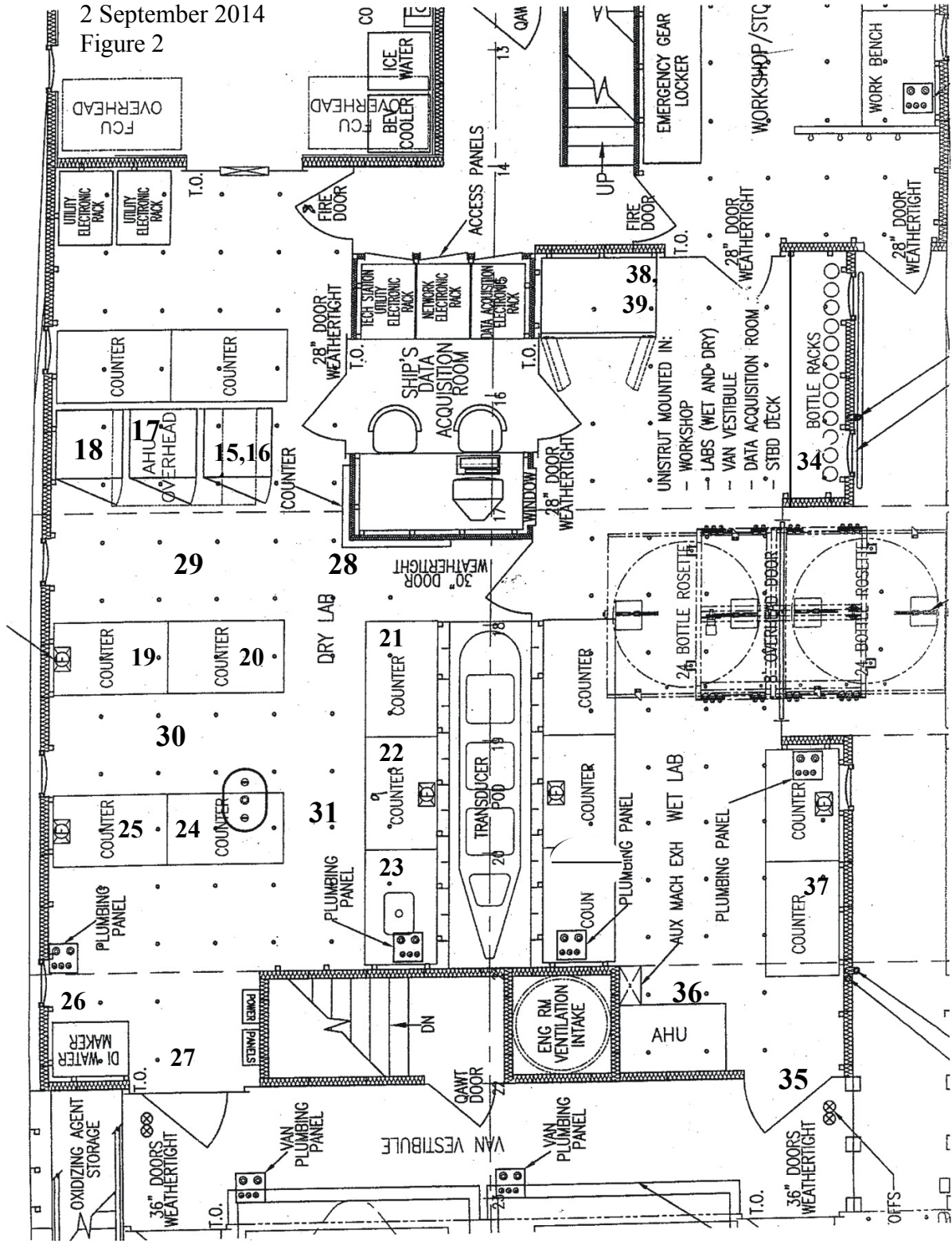
\*Minor <sup>3</sup>H and <sup>14</sup>C contamination was found in the Rad Van. No action is required although we do recommend cleaning of the deck areas to prevent tracking contamination into the ship.

# UNOLS General Purpose Van 625.4.02



# RV Hugh Sharp Lab Spaces

SWAB # 738  
 2 September 2014  
 Figure 2



UNOLS VAN 2408.04

