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Tritium Laboratory

27 July 2015

SWAB REPORT # 777

SWAB DATE: 21 July 2015

R/V Atlantic Explorer

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
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Rod Johnson

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 # 777

LOCATION: BIOS, Bermuda
VESSEL: R/V Atlantic Explorer

DATE: 21 July 2015
TECHNICIAN: Charlene Grall

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	22	±	94	-25	±	46
<u>Forward Lab (Figure 1)</u>						
3 Port sink area	9	±	54	-3	±	6
4 Port benchtop aft of sink	14	±	96	-17	±	30
5 Center benchtop	-2	±	11	-28	±	50
6 Forward benchtop	-10	±	65	-5	±	8
7 Deck at stbd entrance	38	±	60	-21	±	38
8 Deck at aft entrance	30	±	48	-4	±	7
9 Benchtop inside Enviro Room	4	±	25	-13	±	23
10 Deck in Enviro Room	19	±	167	-29	±	53
<u>Aft Lab (Figure 1)</u>						
11 Port sink area	-4	±	25	-13	±	23
12 Port benchtop aft of sink	41	±	78	-36	±	65
13 Forward benchtop	11	±	72	-26	±	46
14 Center benchtop	20	±	121	-29	±	52
15 Inside fume hood	-5	±	38	-15	±	26
16 Deck below fume hood	22	±	96	-26	±	47
17 Inside small black GE	36	±	61	-19	±	34
18 Inside Roper refridgerator, bottom	13	±	88	-13	±	24
19 Inside Roper freezer, top	33	±	63	-22	±	39
20 Inside Whirlpool freezer	22	±	67	-18	±	32
21 Deck between sink and center benchtop	21	±	52	-7	±	12
<u>Main Lab (Figure 1)</u>						
22 Port sink area	7	±	47	-24	±	43
23 Benchtop aft of sink covered by rubbermt	17	±	148	-27	±	48
24 Inside clean bench area	5	±	32	-12	±	21
25 Center benchtop	10	±	68	-28	±	51
26 Deck inside forward entrance	6	±	35	3	±	32
27 Inside Stbd forward freezer - ice only	16	±	109	-45	±	80
28 Inside Port forward freezer- ice only	-10	±	66	-28	±	50

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
<u>Miscellaneous Areas (Figure 1)</u>					
29	Companionway aft of galley, opposite of Lounge	5	± 37	-33	± 60
30	Companionway inside aft entrance	-2	± 15	-13	± 1
<u>UW Radioisotope Van 625.1.01 (Figure 2)</u>					
31	Sink area	169	± 54	33	± 29
32	Benchtop next to sink	33	± 46	-1	± 97
33	Benchtop across from fume hood	65	± 38	41	± 34
34	Inside fume hood	*1102	± 96	*114	± 27
35	Benchtop next to fume hood	477	± 71	43	± 24
36	Inside refrigerator	27	± 46	-1	± 2
37	Inside freezer	*7131	± 229	*272	± 23
38	Deck at entrance near fume hood	*713	± 85	50	± 22
39	Deck between LSC and sink	*551	± 74	*111	± 32
40	Top of LSC	180	± 57	-15	± 28
41	Deck outside van entrance	0	± 3	-12	± 22
42	Final bucket blank	34	± 63	-22	± 39

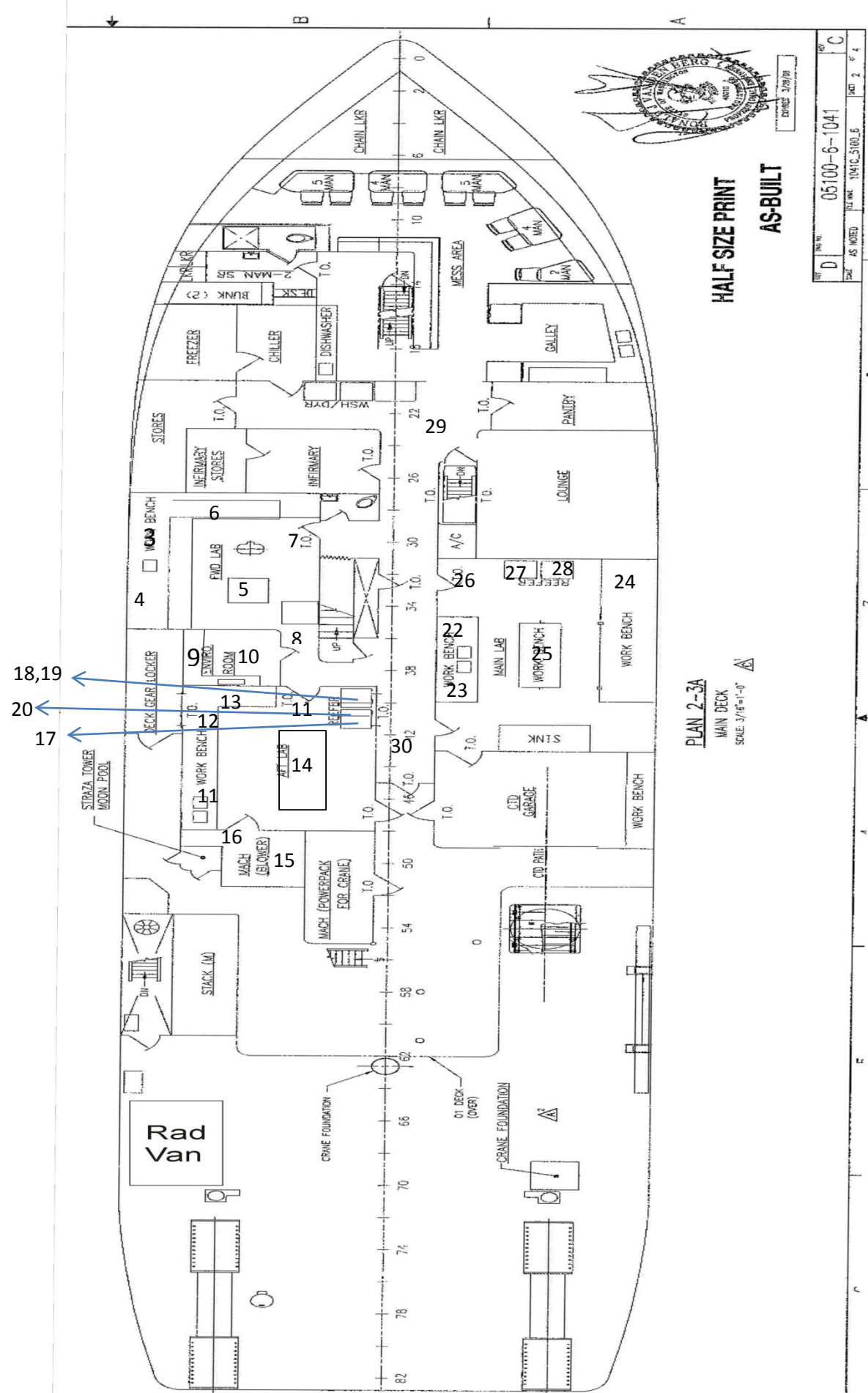
Comments

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 contamination that requires cleaning.

Minor ^{14}C and ^3H contamination was found in radioisotope van; no action needed.

Figure 1
 SWAB #777
 21 July 2015



HALF SIZE PRINT
 AS-BUILT

PLAN 2-3A
 MAIN DECK
 SCALE 3/16"=1'-0"

NO.	REV.	DATE	BY	CHKD.
D	1	05100-6-1041		
DATE AS NOTED		1/14/10	1/14/10	1/14/10
SHEET NO.		2	OF 4	

UW RADIOISOTOPE VAN

SWAB #777
Figure 2
21 July 2015

