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Tritium Laboratory
30 April 2018

SWAB REPORT # 900

SWAB DATE: 22 April 2018

R/V Atlantic Explorer

James Happell

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Date: 2018.04.30 11:08:42 -04'00'

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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 # 900

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

DATE: 22 April 2018
TECHNICIAN: Jim Happell

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		^{3}H dpm/m^{2} error	^{14}C dpm/m^{2} activity		^{14}C dpm/m^{2} error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	-3	±	34	16	±	35
	Main Lab (Figure 1)						
3	Port sink area	-29	±	2809	*64	±	38
4	Benchtop aft of sink	-7	±	29	37	±	36
5	Center benchtop	40	±	37	30	±	33
6	Deck inside forward entrance	84	±	42	39	±	32
7	Deck between center and starboard bencht0ps	58	±	47	21	±	31
8	Forward starboard benchtop	-42	±	54	44	±	38
9	Deck in front of CTD bottle rack	92	±	50	10	±	23
10	Deck in front of port sink	198	±	53	37	±	28
11	Inside fume hood	12	±	28	17	±	34
12	Inside forward starboad freezer	23	±	29	30	±	34
13	Inside forward port freezer	-21	±	28	42	±	37
	Forward Lab (Figure 1)						
14	Port sink area	3	±	10	21	±	35
15	Benchtop aft of sink	-16	±	61	14	±	37
16	Center benchtop	9	±	52	-3	±	30
17	Forward benchtop	-14	±	53	15	±	37
18	Deck at forward entrance	10	±	26	17	±	34
19	Deck at aft entrance	81	±	44	27	±	31
20	Deck in front of port sink	33	±	36	21	±	32
21	Benchtop inside Enviro Room	-6	±	59	22	±	36
22	Deck in Enviro Room	116	±	56	13	±	24

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
	Aft Lab (Figure 1)						
23	Port sink area	-22	±	28	19	±	38
24	Benchtop forward of sink	-1	±	5	31	±	36
25	Forward benchtop	-4	±	14	9	±	36
26	Center benchtop	18	±	34	20	±	34
27	Inside fume hood	3	±	32	3	±	33
28	Deck in front of fume hood	46	±	47	4	±	21
29	Inside aft Cospolich refrigerator	13	±	61	-6	±	19
30	Inside forward Cospolich refrigerator	-11	±	40	17	±	36
31	Inside aft Cospolich freezer	-34	±	44	2	±	19
32	Inside forward Cospolich freezer	9	±	47	1	±	20
33	Deck inside forward entrance	12	±	45	3	±	28
34	Deck inside aft entrance	-4	±	106	12	±	36
35	Deck in front of port sink	15	±	37	10	±	32
	Radioisotiope Van 2409-01 (Figure 2)						
36	Sink area	387	±	70	21	±	18
37	Benchtop across from sink	298	±	65	30	±	24
38	Inside fume hood	152	±	54	4	±	10
39	Top of LSC	*1379	±	109	30	±	11
40	Inside Danby refrigerator	184	±	49	*117	±	36
41	Deck between LSC and fume hood	*2589	±	142	34	±	8
42	Deck at entrance	*6892	±	225	*164	±	16
43	Deck outside van entrance on 01 deck	206	±	58	12	±	18
44	Deck outside door to 01 level	*677	±	82	23	±	14
45	Final bucket blank	-11	±	42	10	±	37

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. The port sink area in the Aft lab had minor ^{14}C contamination. The 01 deck just outside the entrance to the ship has minor ^{3}H contamination. Both of these ares should be cleaned ASAP.
Minor ^{14}C and minor ^{3}H contamination was found in the Rad Van. No action is necessary, but cleaning the deck of the rad van would help prevent tracking contaimination out of the van.

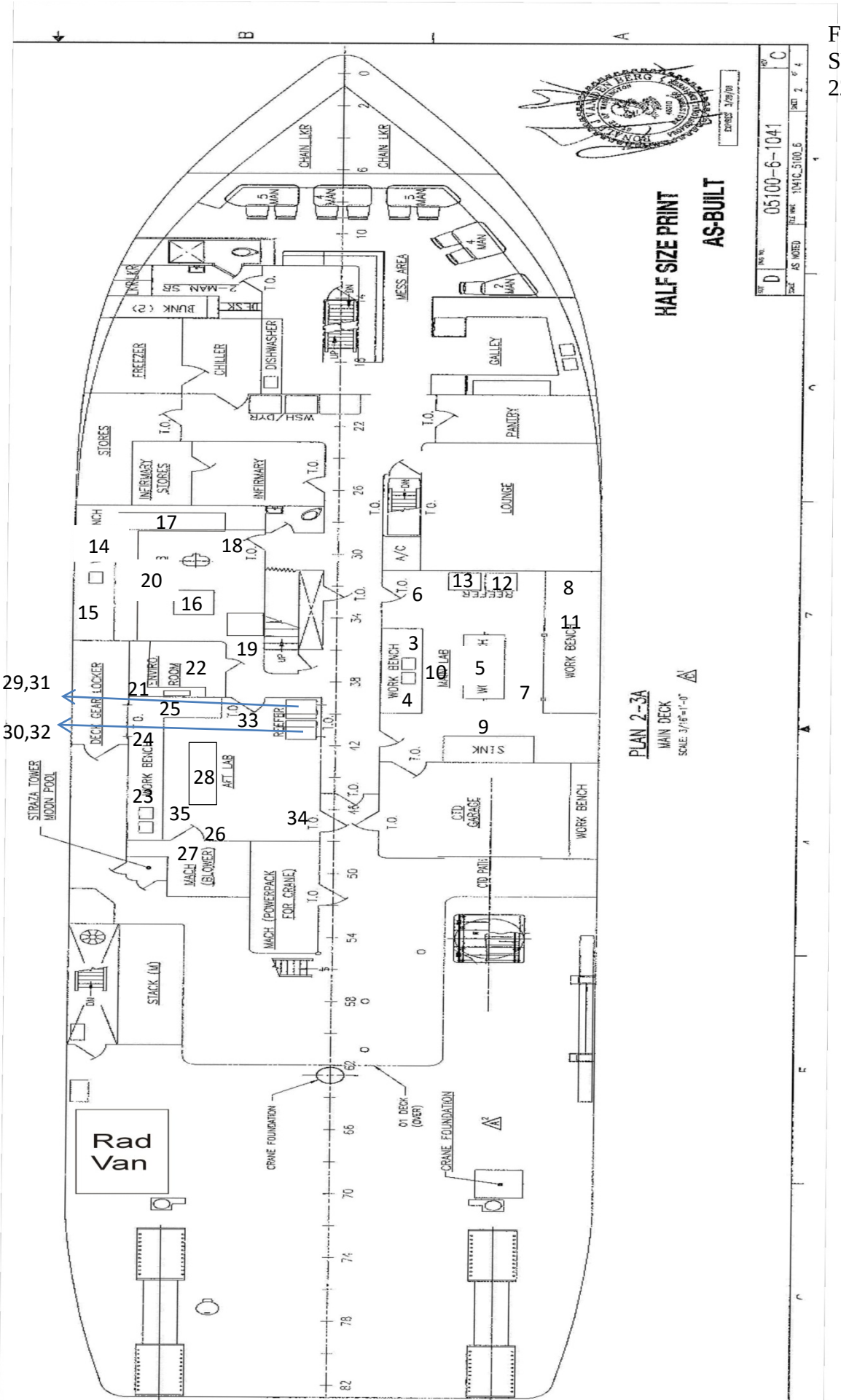

Figure 1
SWAB #900
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SWAB #900
Figure 2
22 April 2018

UNOLS Shared Use Van 2409-01