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Tritium Laboratory

30 May 2017

SWAB REPORT # 859

SWAB DATE: 23 May 2017

R/V Oceanus

Radioisotope Van # 625.101-2

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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 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 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 # 859

LOCATION: San Diego, CA

DATE: 28 October 2016

VESSEL: *R/V Oceanus*

TECHNICIAN: Charlene Grall

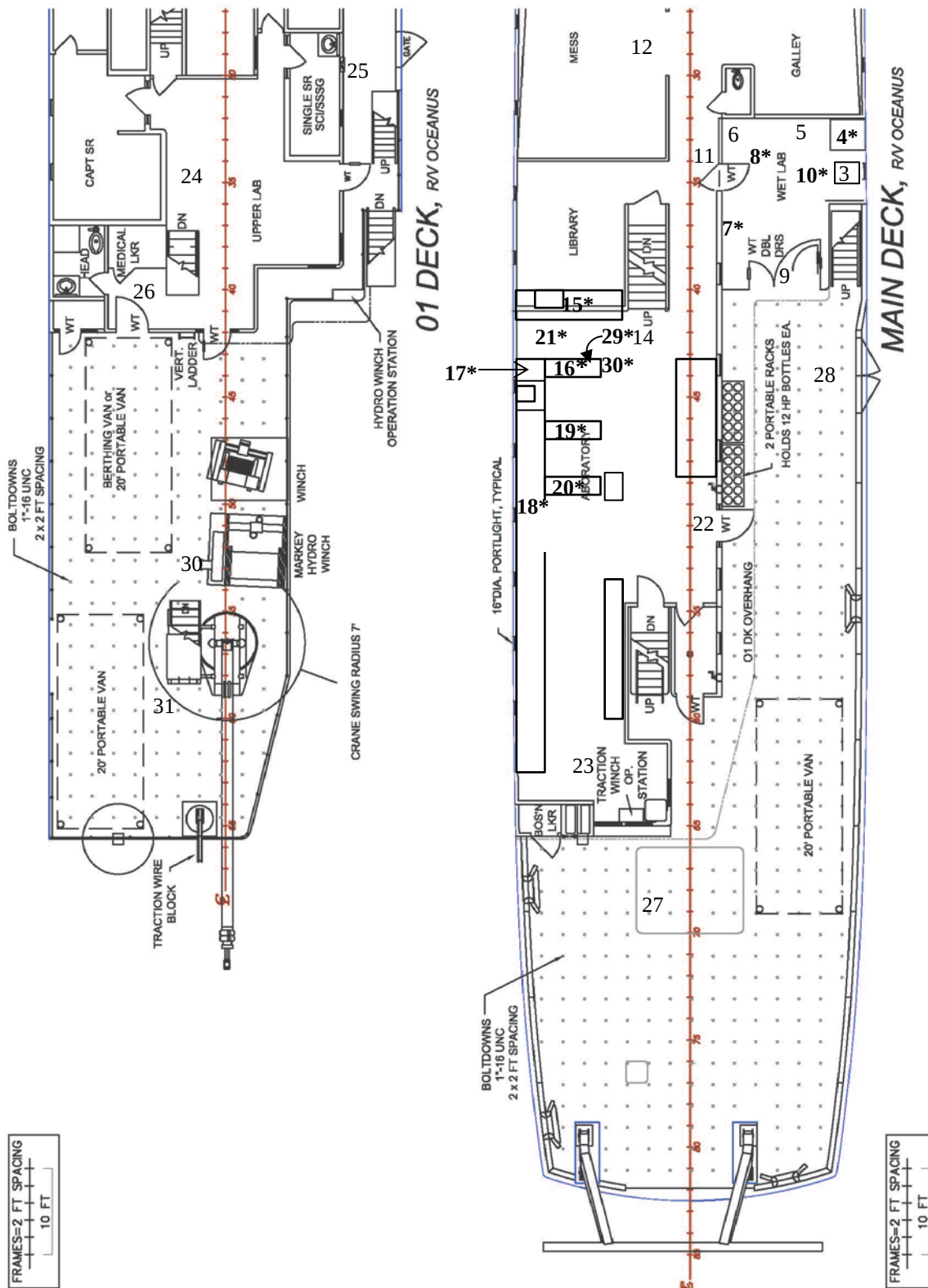
Sample #	Sample Identification	³ H dpm/m ²			¹⁴ C dpm/m ²		
		activity	error		activity	error	
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank CO #2	30	±	91	-29	±	26
	<u>Wet Lab (Fig. 1)</u>						
3	Starboard sink area	38	±	51	-4	±	18
4	Inside fume hood	424	±	60	*289	±	45
5	Benchtop adjacent to fume hood	2	±	52	-1	±	11
6	Forward benchtop above chest freezer	-20	±	0	18	±	42
7	Port benchtop	11	±	9	*111	±	43
8	Deck in front of chest freezer	-6	±	6	*123	±	44
9	Deck inside aft entrance	30	±	53	-4	±	22
10	Deck in front of sink	62	±	35	*72	±	40
29	Inside reefer drawer under forward bench	-10	±	15	*97	±	43
30	Inside freezer drawer under forward bench	32	±	4	*1512	±	76
	<u>Miscellaneous areas (Fig. 1)</u>						
11	Companionway between Wet Lab & Lounge	31	±	76	-26	±	38
12	Deck by drink machine in Mess	28	±	67	-17	±	71
13	Companionway outside Laundry	54	±	53	-8	±	28
	<u>Main Lab (Fig. 1)</u>						
14	Deck by forward stair to 01 Deck	38	±	45	8	±	31
15	Forward sink area	255	±	16	*3992	±	113
16	Center of benchtop aft of sink	95	±	15	*803	±	61
17	Forward section of port benchtop	29	±	35	26	±	38
18	Aft section of port benchtop	22	±	7	*366	±	51
19	Middle benchtop	85	±	21	*383	±	51
20	Aft benchtop near SoLo freezer	-23	±	15	*226	±	47
21	Deck in front of sink	40	±	30	*64	±	40
22	Deck at aft port entrance	13	±	29	18	±	38
23	Deck at winch operator station	40	±	53	-9	±	17
	<u>01 Deck (Fig. 1)</u>						
24	Deck at top of stairs to Upper Lab	-15	±	0	-8	±	40
25	Deck of Upper Lab	29	±	100	-34	±	53
26	Deck at aft entrance near Infirmary	52	±	64	-28	±	70

Sample #	Sample Identification	^3H dpm/m ²			^{14}C dpm/m ²		
		activity		error	activity		error
	<u>Aft Deck (Fig. 1)</u>						
27	Deck outside entrance of Rad Van	-9	±	22	-6	±	51
28	Deck near rosette on starboard midship	4	±	191	-6	±	18
31	Intermediate bucket blank	19	±	71	-15	±	44
	<u>Radioisotope Van (Fig. 2)</u>						
32	Sink area	282	±	14	*5855	±	135
33	Benchtop adjacent to LSC	45	±	4	*1964	±	84
34	Inside fume hood	*962	±	69	*1432	±	73
35	Inside incubator	-2532	±	13	***559597	±	1287
36	Benchtop across from incubator	76	±	4	*5516	±	131
37	Benchtop across from LSC	76	±	6	*2811	±	97
38	Inside refrigerator under LSC	*704	±	67	*669	±	56
39	Inside refrigerator opposite of LSC	120	±	16	*1063	±	67
40	Deck in front of fume hood	41	±	3	*2669	±	96
41	Deck in front of sink and entrance	78	±	3	**14331	±	206
42	Final bucket blank CO #2	91	±	61	-33	±	61

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. Minor ^{14}C contamination is spread throughout the Wet Lab and Main Lab in the ship. These areas should be cleaned ASAP before any additional use to help prevent spreading the contamination to additional areas. It is atypical to find this much contamination in the ship and suggests that equipment used in the Rad Van were brought into the ship. There was also widespread ^{14}C contamination in the Rad Van. Most of the contamination is minor, however there was moderate contamination on the deck near the entrance and major contamination in the incubator. The deck of the rad van should be cleaned before any further use. The incubator should be brought to the attention of radiation safety, as there may be a health hazard.

Figure 1
SWAB #859
23 May 2017



SWAB # 859

23 May 2017

Figure 2

VAN SN-625.101-2

