

UNIVERSITY OF MIAMI

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SCHOOL of MARINE &
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Tritium Laboratory
May 16, 2022

SWAB REPORT # 1030

SWAB DATE: 9 May 2022

RV Atlantic Explorer & Radiation Van #625.5.02

James D. Happell

Distribution:
SWAB Committee
Rick Verlini
Rod Johnson

COMMENTS TO SWAB REPORTS

15 December 2021

The LSC is now a Quantulus GCT 6220, with the SWAB counting assay having background cpm of 0.3 & 1.2 for ^3H & ^{14}C . This replaces an LSC with background cpm of 1.6 & 5.5 for ^3H & ^{14}C .

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. All activities significantly above background will be in **bold**.

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 insitution promptly by phone or email.

REPORT FOR SWAB # 1030

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

DATE: 9 May 2022
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	± 43	0	± 20
2	Initial bucket blank	-13	± 49	5	± 15
	<u>Aft Lab (Figure 1)</u>				
3	Aft Inside fume hood	-12	± 45	-1	± 4
4	Deck in front of fume hood	-13	± 49	-19	± 23
5	Forward benchtop	-28	± 47	5	± 18
6	Benchtop forward of sink	-7	± 29	-7	± 26
7	Port sink area	-40	± 66	-5	± 18
8	Inside -80C freezer #2	16	± 29	0	± 2
9	Inside -80C freezer #1	-32	± 53	-20	± 23
10	Inside DEAD Cospolich refrigerator	-40	± 66	4	± 23
11	Inside DEAD freezer	-28	± 47	15	± 15
12	Inside LIVE Cospolich refrigerator	-41	± 68	3	± 37
13	Inside LIVE Cospolich freezer	-33	± 55	-3	± 13
14	Deck at forward entrance	-28	± 46	-11	± 13
15	Center benchtop	-20	± 33	12	± 15
16	Deck aft entrance	14	± 54	-14	± 16
	<u>Forward Lab (Figure 1)</u>				
17	Forward benchtop	-11	± 41	-5	± 18
18	Port benchtop forward of sink	6	± 23	3	± 12
19	Port benchtop aft of sink	19	± 34	-6	± 22
20	Port sink area	-47	± 77	4	± 27
21	Center benchtop	17	± 35	-6	± 23
22	Deck inside starboard entrance	3	± 19	4	± 13
23	Deck outside Enviro room	-36	± 60	1	± 11
24	Deck inside aft entrance	-15	± 58	-2	± 9
25	Deck in front of sink	-24	± 55	-24	± 28

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
<u>Main Lab (Figure 1)</u>					
26	Deck inside forward entrance	-19 ±	32	-20 ±	23
27	Port sink area	-6 ±	26	0 ±	35
28	Benchtop inside laminar flow hood	-20 ±	44	-7 ±	28
29	Port benchtop forward of sink	20 ±	44	-14 ±	17
30	Deck inside aft entrances	-21 ±	34	8 ±	15
31	Inside new unused freezer	-8 ±	31	-13 ±	15
32	Inside refrigerator	-8 ±	34	-13 ±	15
33	Intermediate bucket blank	-19 ±	44	-6 ±	22
<u>Radiation Van #625.5.02 (Figure 2)</u>					
34	Benchtop adj to sink	482 ±	64	22 ±	7
35	Benchtop adjacent to fume hood	*830 ±	82	22 ±	6
36	Inside fume hood and adjacent benchtop	132 ±	42	4 ±	5
37	Top of LSC	148 ±	43	-5 ±	29
38	Inside freezer	10 ±	23	6 ±	12
39	Inside refrigerator	435 ±	60	*75 ±	14
40	Benchtop adjacent to LSC	23 ±	37	-9 ±	34
41	Deck in front of and below fume hood	217 ±	48	43 ±	13
42	Sink area	0 ±	6	3 ±	13
43	Deck inside entrance	84 ±	36	24 ±	12
44	Deck between fridge and freezer	221 ±	59	*59 ±	15
45	Final bucket blank	-38 ±	64	5 ±	21

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Reports may now contain values less than zero. 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. Please note that we are now using a Quantulus 6220 LSC which counts very near natural background. While the cleanup standards have not changed all values above background will now be in bold. All areas tested inside the ship had no contamination that requires cleaning. Minor ³H and ¹⁴C contamination was found in the Rad Van but no action is necessary.

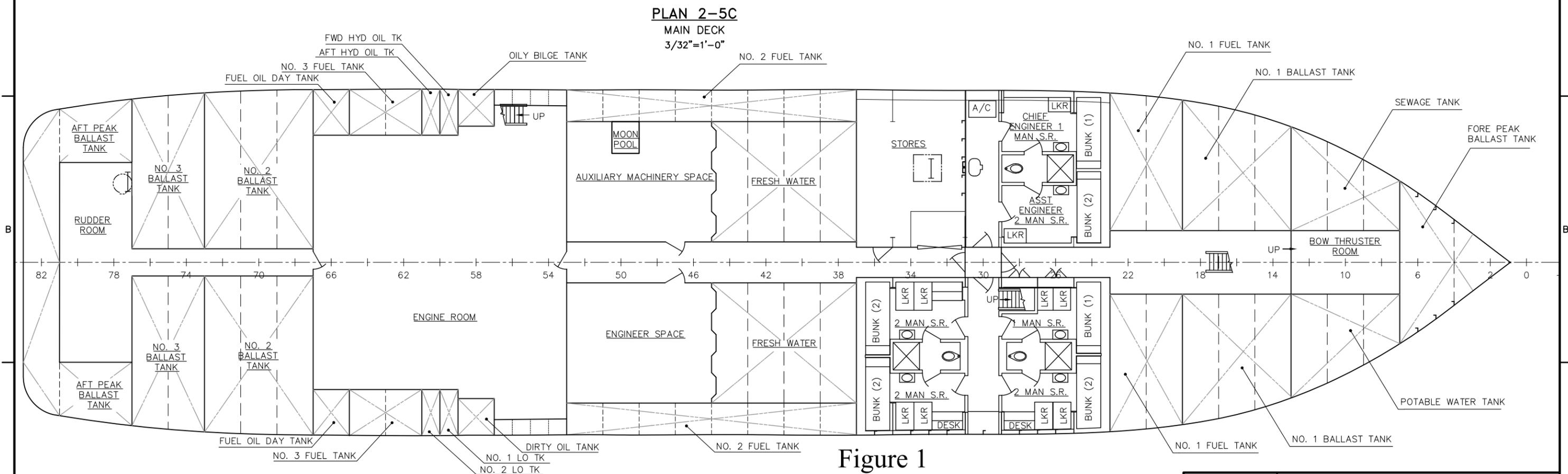
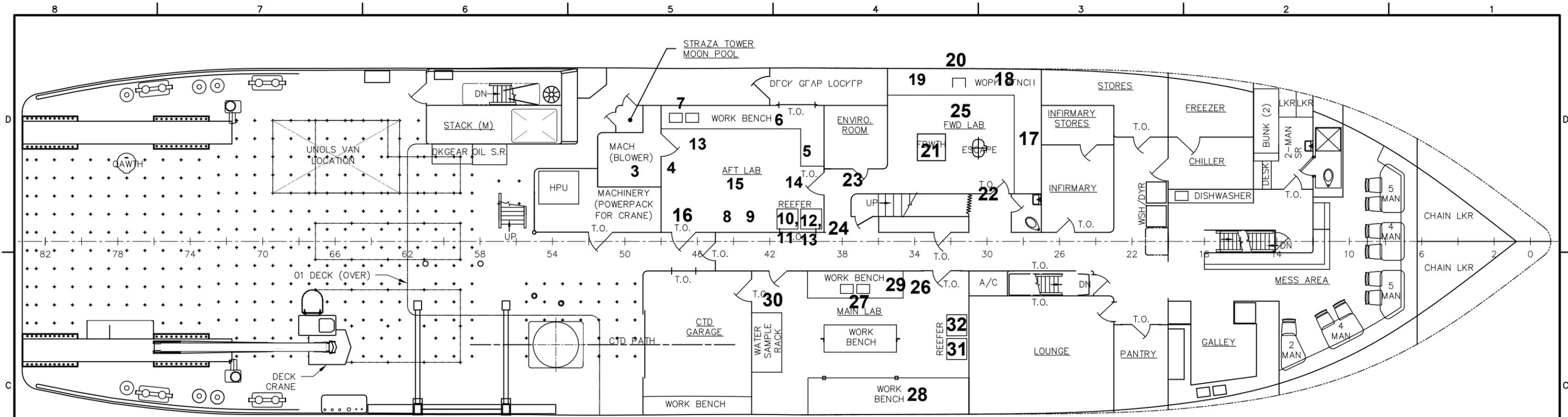


Figure 1
SWAB #1030
9 May 2022

BIOS ST. GEORGE'S, BERMUDA			
R/V ATLANTIC EXPLORER GENERAL ARRANGEMENT HOLD LEVEL AND MAIN DECK PLANS			
 THE GLOSTÉN ASSOCIATES Consulting Engineers Serving the Marine Community		1201 Western Avenue, Suite 200 Seattle, Washington 98101-2953 TEL: 206.624.7850 WEB: www.glosten.com	
Drawn TGA	Checked CSC	Approved DHK	Date 05/30/2014
Scale AS NOTED	Drawing Number 12146-070-01	Sheet 2 of 4	Revision A

UNOLS Rad Van #625.5.02

Figure 2
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