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Tritium Laboratory
13 October 2014

SWAB REPORT #782

SWAB DATE: 6 August 2015

R/V *Blue Heron* and Radiation Van

James Happell

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Distribution:
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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 # 782

LOCATION: Duluth, MN
VESSEL: R/V *Blue Heron*

DATE: 6 August 2015
TECHNICIAN: Jim Happell

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	2	±	15	10	±	32
	Dry Lab (Figure 1)						
3	Deck in front of passage to lazarette	-6	±	38	30	±	34
4	Inside chest freezer	-5	±	28	-2	±	9
5	Starboard benchtop	-17	±	87	26	±	34
6	Center benchtop	-48	±	239	44	±	36
7	Benchtop adajacent to sink	-17	±	84	29	±	34
8	Deck in front of sink	29	±	37	16	±	30
9	Deck in front of stairs to main deck	40	±	48	-4	±	18
10	Port benchtop	13	±	24	25	±	32
	Wet Lab & Galley/Mess deck (Figure 2)						
11	Inside freezer	10	±	27	14	±	31
12	Inside refrigerator	17	±	25	31	±	33
13	Deck in front of stairs to dry lab	4	±	30	4	±	31
14	Deck in front of aft door	-24	±	121	19	±	35
15	Galley/Mess deck by aft door	28	±	40	9	±	28
16	Deck in galley	-15	±	73	18	±	34
17	Deck under table	4	±	22	9	±	32
18	Benchtop forward of starboard sink	-8	±	189	21	±	34
19	Benchtop aft of port sink	-1	±	6	20	±	33
20	Deck center of lab	-8	±	38	36	±	34
21	Forward benchtop	-3	±	16	26	±	33
	Whaleback Deck (Figure 3)						
22	Deck inside pilot house	-8	±	21	9	±	34
23	Deck in fron of pilot house	12	±	25	21	±	32
24	Deck by hrdro winch	32	±	47	0	±	7
	Main Deck (Figure 2)						
25	Deck under A-frame	-7	±	33	38	±	34
26	Deck near door to lab	12	±	54	-4	±	19
27	Deck below entrance to rad van	22	±	32	23	±	31

Sample #	Sample Identification	^{3}H dpm/m^{2}			^{14}C dpm/m^{2}		
		activity		error	activity		error
	UMN Radioisotope Van (Figure 4)						
28	Inside fume hood	82	±	51	4	±	16
29	Benchtop adjacent to LSC	279	±	60	28	±	22
30	Sink area	-19	±	95	29	±	35
31	Inside refridgerator near single door	31	±	29	44	±	33
32	Inside refrigerator next to LSC	40	±	39	18	±	29
33	Deck in front of LSC	281	±	59	41	±	25
34	Deck inside single door entrance	26	±	23	68	±	34
35	Final bucket blank	40	±	46	-1	±	13

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 on tested on the ship and in the van were free of radioisotope contamination that requires cleaning.

R/V Blue Heron Lower Deck

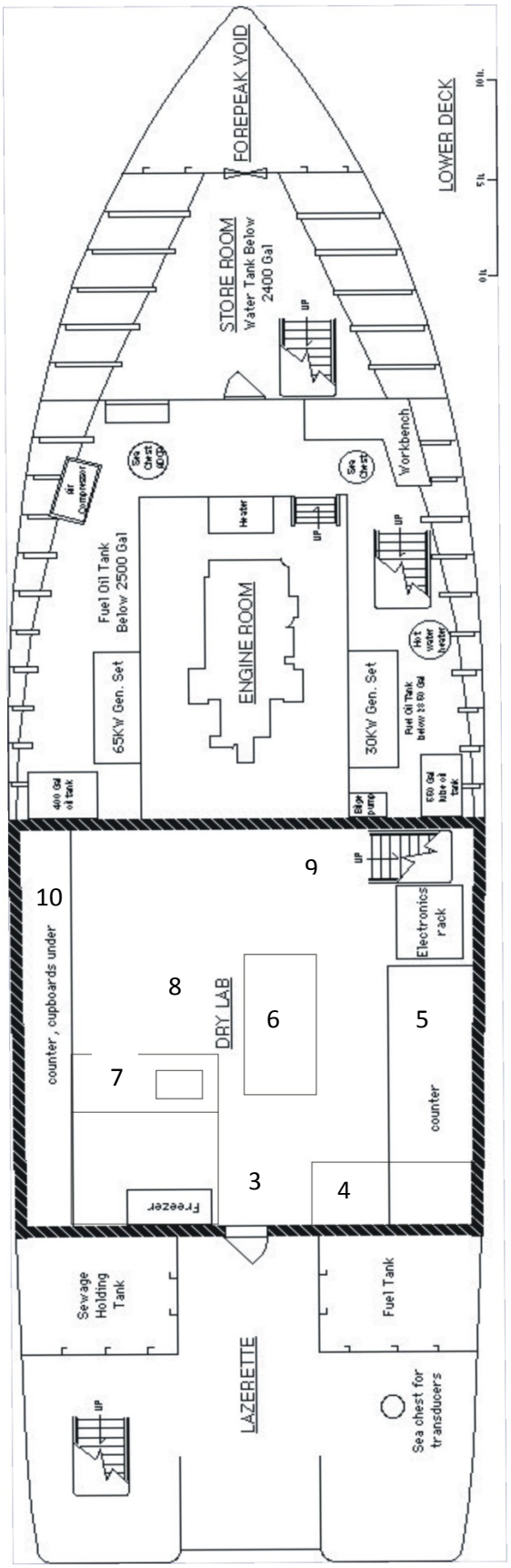

Figure 1
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R/V Blue Heron Main Deck

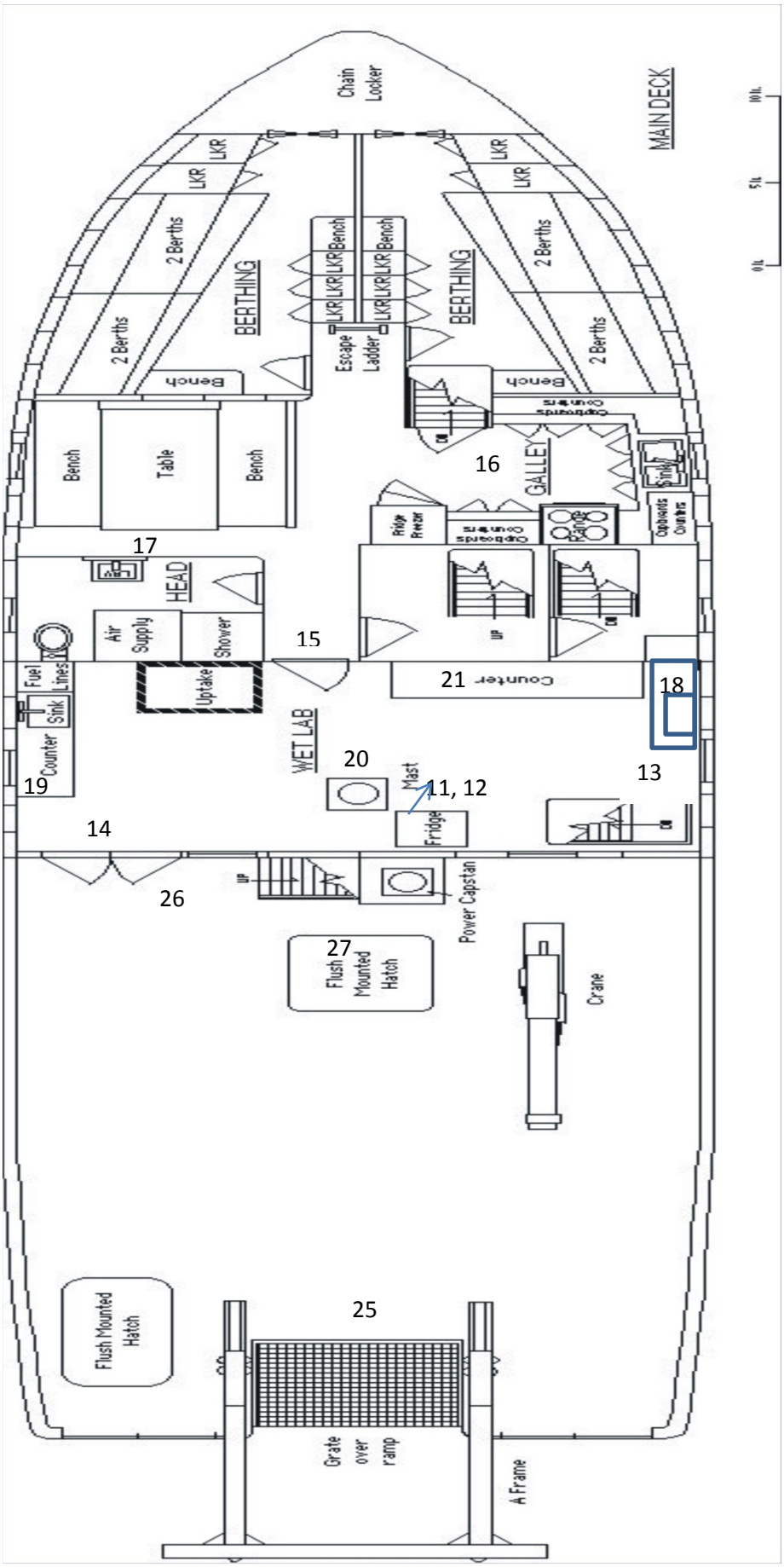

Figure 2
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R/V Blue Heron Whaleback Deck

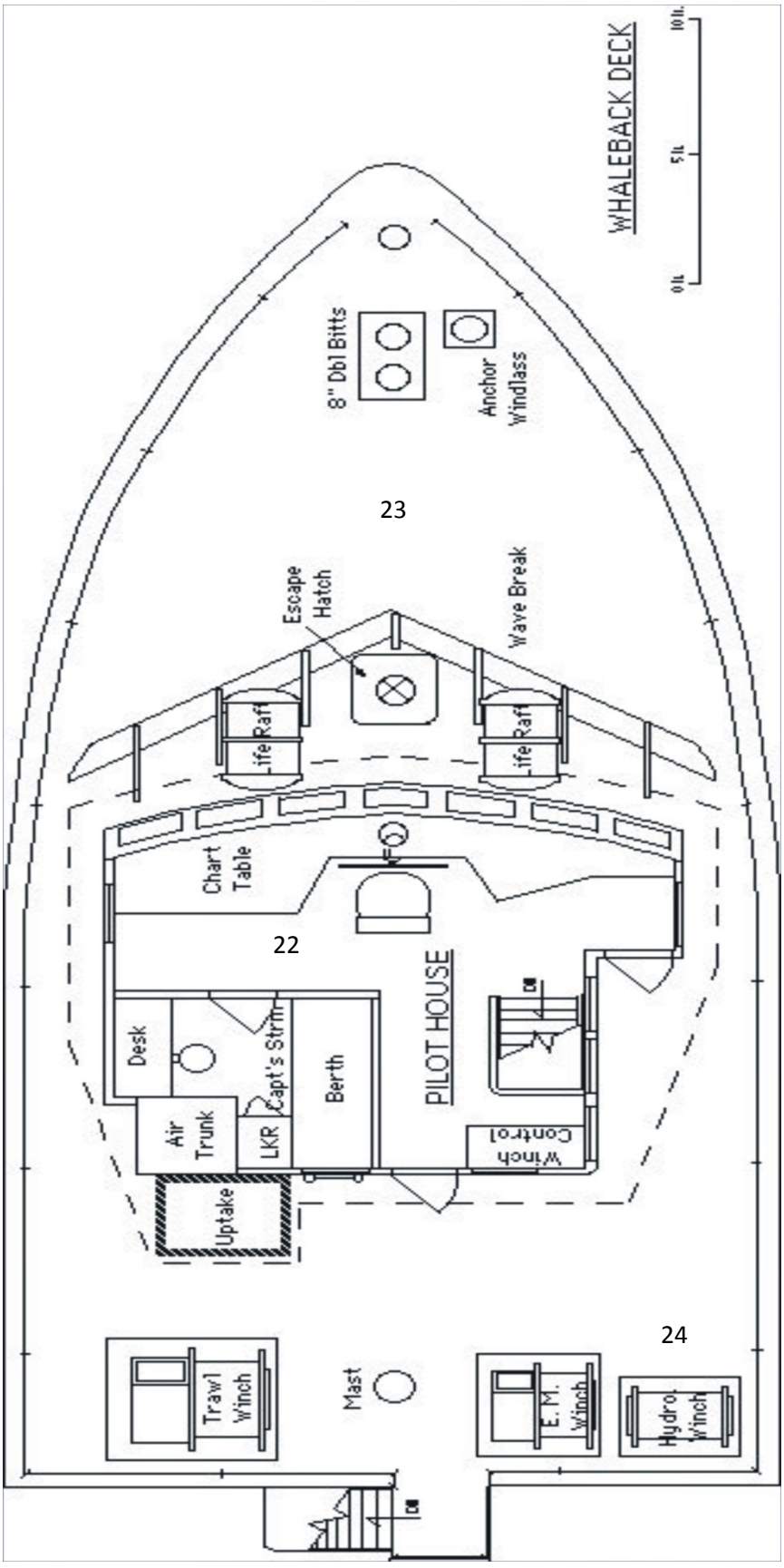

Figure 3
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Figure 4
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U. of MN. Radioisotope Van