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4 October 2012

SWAB REPORT # 648 recounted

SWAB DATE: 18 Septembet 2012

*R/V Blue Heron*

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James D. Happell

Distribution:  
SWAB Committee  
Doug Ricketts

## COMMENTS TO SWAB REPORTS

23 November 2010

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  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  $\text{dpm}/\text{m}^2$ . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in  $\text{dpm}/\text{m}^2$ . An error larger than the activity indicates that the activity is not significantly different from zero.

### Criteria for SWAB Results

Category	$^3\text{H}$ ( $\text{dpm}/\text{m}^2$ )	$^{14}\text{C}$ ( $\text{dpm m}^2$ )	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:  $^{14}\text{C}$  and  $^{35}\text{S}$  have peak energies of 156 and 167 KeV, respectively; thus  $^{35}\text{S}$  will be registered as  $^{14}\text{C}$  by our counting techniques. Categories A, B and C are not a health hazard.

### Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

$^3\text{H}$ : 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.

$^{14}\text{C}$ : 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  $^3\text{H}$ .

### Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D dispose in radiation waste system.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email.

REPORT FOR SWAB # 648 recounted

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

DATE: 18 September 2012  
TECHNICIAN: Jim Happell

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	37	± 34	4	± 20
	<u>Dry Lab (Figure 1)</u>				
3	Deck in front of passage to lazarette	67	± 37	7	± 21
4	Inside chest freezer	25	± 27	17	± 30
5	Starboard bench top	51	± 32	15	± 27
6	Center bench top	59	± 34	15	± 26
7	Bench adjacent to sink	47	± 40	0	± 0
8	Deck in front of sink	54	± 35	4	± 17
9	Deck in front of stairs to Main Deck	39	± 33	3	± 17
	<u>Wet Lab (Figure 2)</u>				
10	Inside freezer	81	± 35	12	± 23
11	Inside refrigerator	369	± 54	1	± 1
12	Deck in front of stairs to Dry Lab	25	± 28	15	± 29
13	Deck in front of aft door	55	± 34	7	± 22
14	Galley/Mess deck by aft door	59	± 36	0	± 0
15	Deck in Galley	42	± 45	0	± 0
16	Deck under table	47	± 33	4	± 18
17	Bench top forward of starboard sink	45	± 33	0	± 0
18	Bench top aft of port sink	33	± 35	0	± 0
19	Deck center of lab	20	± 29	5	± 26
	<u>Whaleback Deck (Figure 3)</u>				
20	Deck inside pilot house	41	± 37	8	± 24
21	Deck in front of pilot house	22	± 31	0	± 0
22	Deck by hydro winch	43	± 37	0	± 0
23	Intermediate bucket blank	61	± 39	0	± 0
	<u>U. of MN Radioisotope Van (Figure 4)</u>				
24	Bench top adjacent to LSC	*629	± 64	41	± 18
25	Inside fume hood	129	± 40	0	± 0
26	Sink area	94	± 38	0	± 0
27	Inside fridge next to single door	45	± 35	0	± 0

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
28	Inside fridge next to LSC	*683	± 66	24	± 13
29	Deck in front of LSC	231	± 49	5	± 8
30	Deck inside single door entrance	95	± 35	28	± 27
31	Intermediate bucket blank	54	± 34	0	± 0
	<u>Main Deck (Figure 2)</u>				
32	Deck under A-frame	34	± 35	0	± 0
33	Deck by door to lab	29	± 29	7	± 25
34	Final bucket blank	57	± 36	0	± 0

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. When these samples were first counted the <sup>14</sup>C instrument blank was lower than we normally see. This made it look like there was widespread minor <sup>14</sup>C contamination in the ship. Therefore the same LSC vials were recounted. This time the <sup>14</sup>C background was normal and there was no indication of <sup>14</sup>C contamination in the ship or radiation van that requires cleaning. The radiation van had minor <sup>3</sup>H contamination, but no action is required.

# R/V Blue Heron Lower Deck

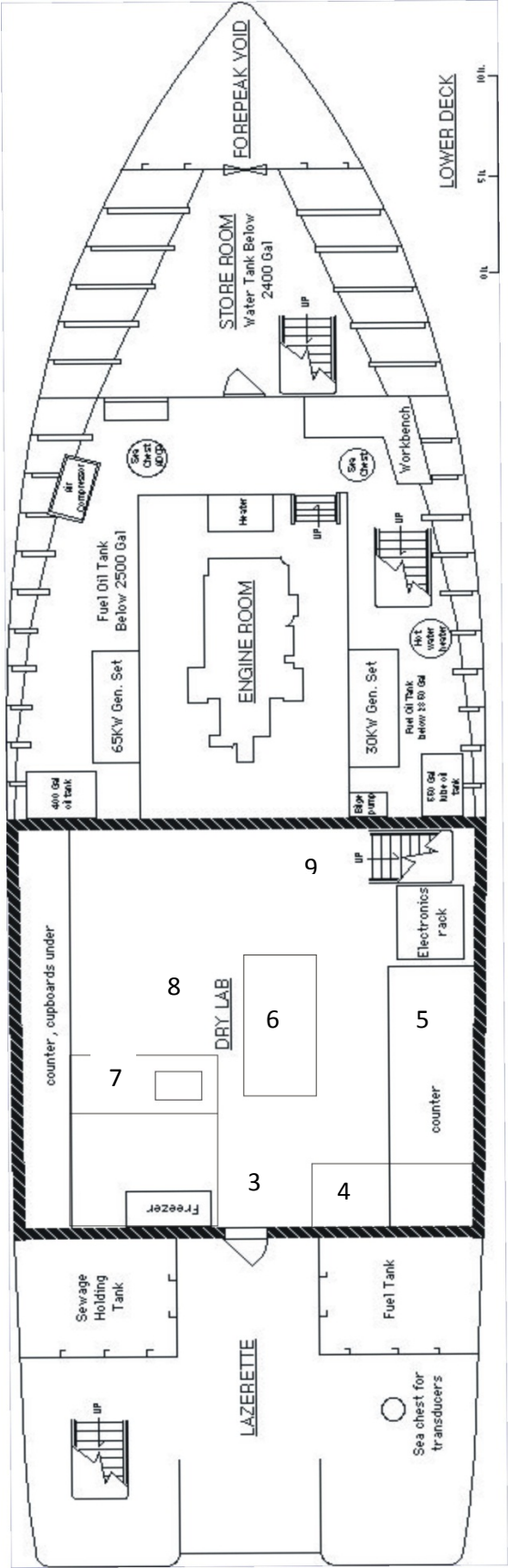


Figure 1  
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*R/V Blue Heron Main Deck*

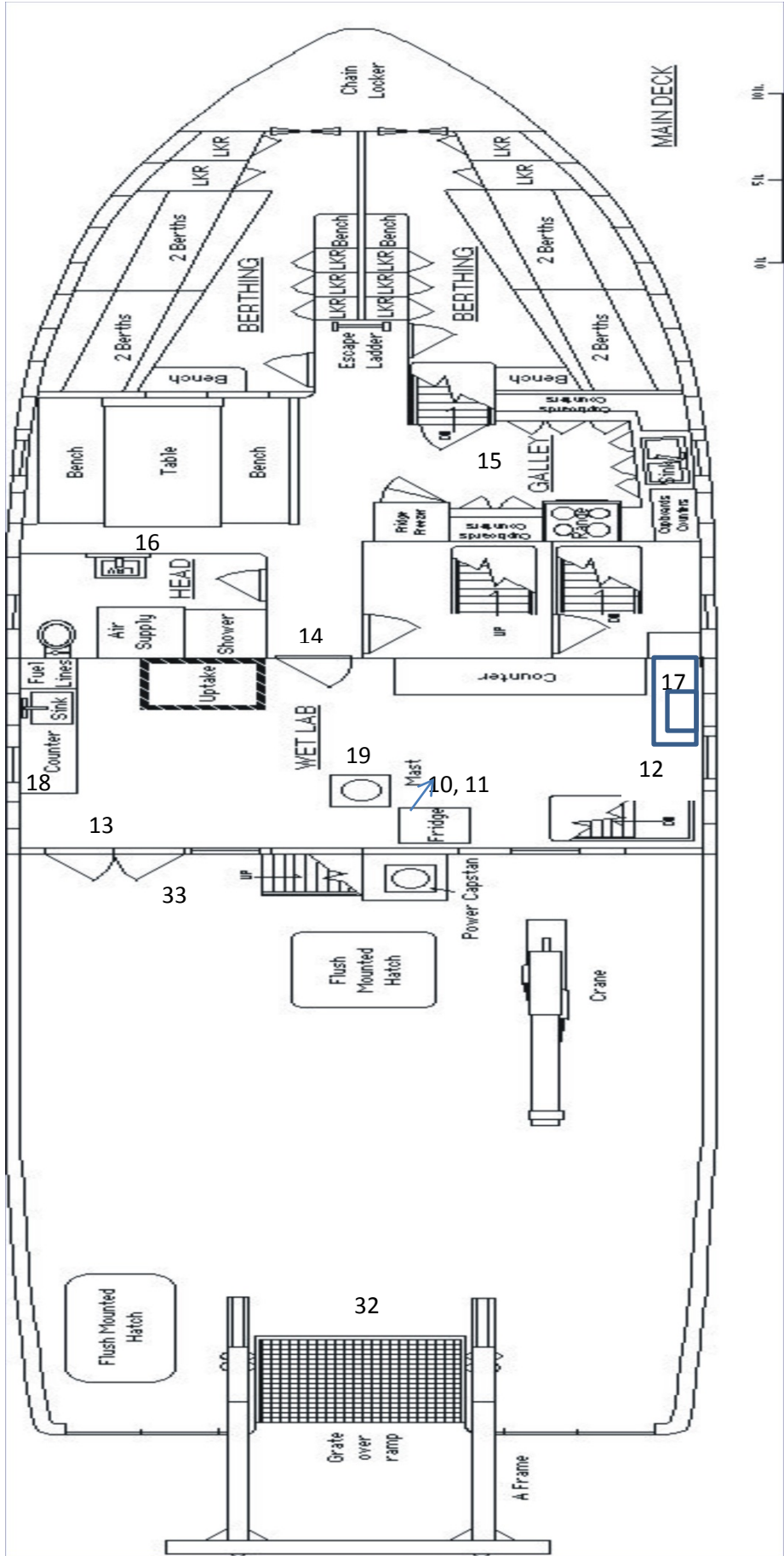


Figure 2  
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*R/V Blue Heron* Whaleback Deck

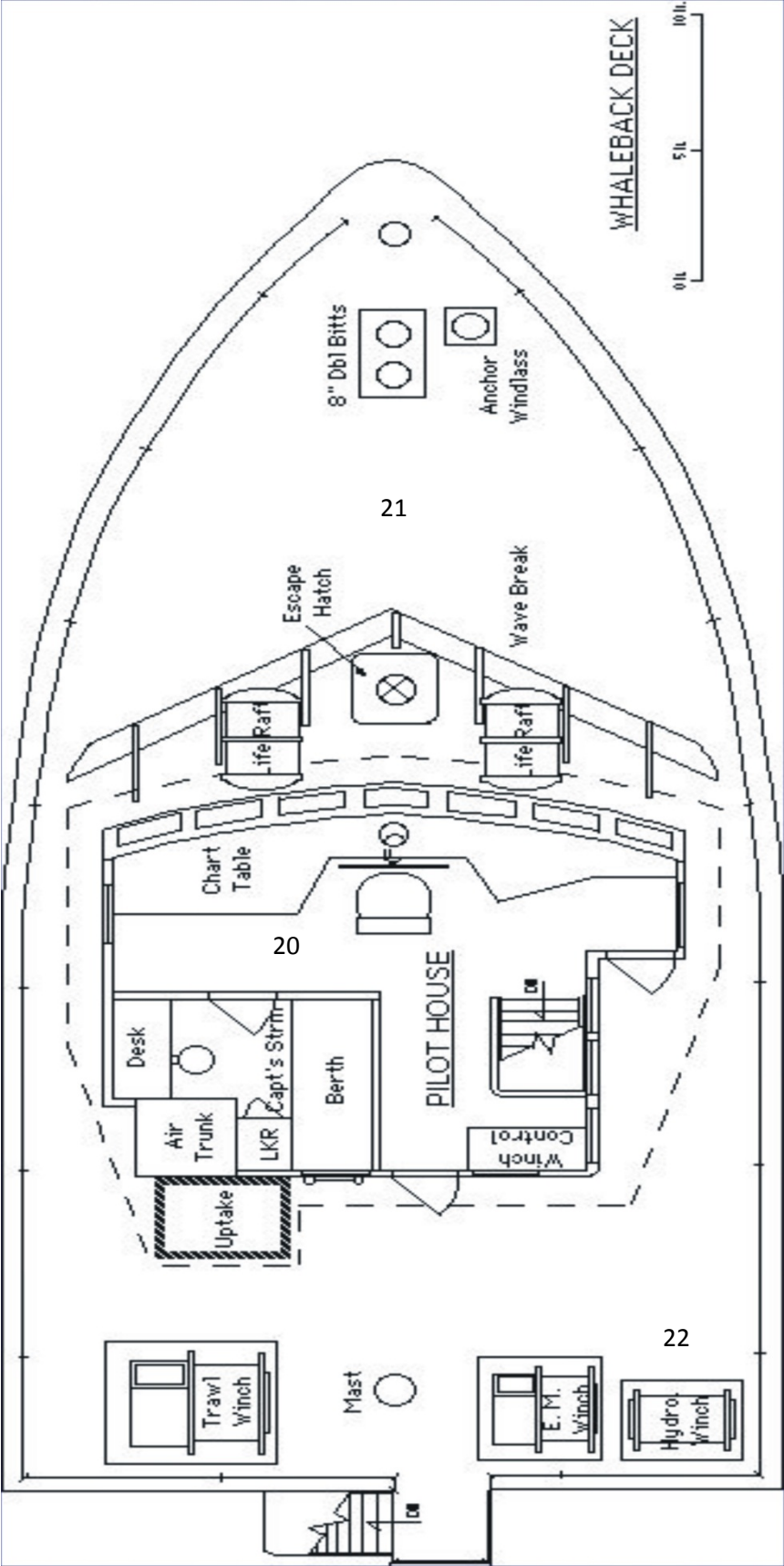


Figure 3  
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# U. of MN. Radioisotope Van

