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5 June 2013

SWAB REPORT # 681

SWAB DATE: 5 April 2013

R/V Nathaniel B. Palmer
Radioisotope Van #4

James D. Happell

Distribution:
SWAB Committee
Phil Spindler
Amy Westman

COMMENTS TO SWAB REPORTS 23 November 2010

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/m2 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 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 # 681

LOCATION: Punta Arenas, Chile
VESSEL/LAB: *R/V Nathaniel B. Palmer*

DATE: 5 April 2013
TECHNICIAN: Amy Westman

Sample #	Sample Identification	^{3}H dpm/m^{2} activity	±	error	^{14}C dpm/m^{2} activity	±	error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	41	±	49	0	±	0
	Radioisotope Van #4 (Figure 1)						
3	Inside fume hood	393	±	71	45	±	25
4	Benchtop left of sink	286	±	61	*94	±	33
5	Sink area	*934	±	96	49	±	19
6	Waste collection area	479	±	29	*3963	±	111
7	Top of LSC	187	±	54	*65	±	32
8	Benchtop across from sink	397	±	70	9	±	10
9	Benchtop across from freezer	276	±	47	*342	±	44
10	Inside freezer	*1472	±	113	*169	±	29
11	Inside refridgerator	*4982	±	190	*765	±	47
12	Deck in front of fume hood	*625	±	81	*62	±	24
13	Deck under escape hatch	292	±	55	*195	±	39
14	Deck inside entrance	244	±	57	*88	±	33
15	Intermediate bucket blank	0	±	0	32	±	36
	02 Deck (Figure 2)						
16	Waste storage area	19	±	48	3	±	25
17	Deck outside rad van door	33	±	39	25	±	32
18	Top of incubator	0	±	0	35	±	35
	Helo Hangar & Workshop (Figure 2)						
19	Deck by chem van	5	±	22	15	±	34
20	Bottom of rad refrigerator, inside	0	±	0	25	±	35
21	Top of rad refrigerator, inside	5	±	13	29	±	35
22	Deck by sink	0	±	0	57	±	37
23	Deck by rad refrigerator	0	±	0	14	±	38
24	Inside rad freezer	0	±	0	27	±	35
25	Entrance to Helo Hangar	10	±	36	9	±	32
	Bio Lab (Figure 3)						
26	Deck inside entrance	0	±	0	18	±	35
27	Deck by fwd entrance	0	±	0	11	±	41
28	Deck by aft hood	24	±	54	0	±	0
29	Deck in front of refrigerators	45	±	59	0	±	0
30	Outboard sink	50	±	43	30	±	32
31	Inboard sink	41	±	34	*53	±	34

Sample #	Sample Identification	^{3}H dpm/m^2 activity		error	^{14}C dpm/m^2 activity		error
32	Inside fwd fume hood	0	±	0	25	±	35
33	Inside aft fume hood	0	±	0	19	±	35
34	Big Antarctica - sink area	0	±	4	12	±	34
35	Little Antarctica - benchtop by sink	0	±	0	6	±	42
50	Deck outside Big Antarctica door	0	±	0	9	±	38
51	Deck outside Little Antarctica door	22	±	75	0	±	0
	Aft Dry Lab (Figure 4)						
36	Top of Revco chest freezer	29	±	89	0	±	0
37	Deck by Revco chest freezer	0		0	6		39
38	Inside inboard incubator	0	±	0	16	±	39
39	Deck between tables	0		0	29		37
40	Port sink	0		0	20		38
41	Deck by aft door	0	±	0	43	±	36
42	Deck to Baltic Room	4	±	28	7	±	33
43	Aft sink area	15		57	0		0
44	Deck inside fwd door	15	±	42	7	±	31
45	Intermediate bucket blank	6	±	26	13	±	33
46	Inside Fisher freezer	0	±	0	0	±	0
47	Inside outboard incubator	9	±	18	37	±	35
48	Outboard fwd benchtop	30	±	51	3	±	22
49	Deck by aft sink	0		0	0		0
52	Entrance to fwd Dry Lab	0	±	0	10	±	38
53	Deck by hallway entrance to Baltic Room	0	±	0	44	±	36
54	Fwd door deck to Hydro Lab	0	±	0	0	±	0
55	Intermediate bucket blank	19	±	38	15	±	32
	Hydro Lab (Figure 5)						
56	Inside Summit refrigerator	5	±	171	0	±	0
57	Inside Fisher refrigerator	10	±	33	12	±	33
58	Stbd sink area	0	±	0	46	±	37
59	Aft Benchtop	0	±	0	19	±	36
60	Deck by aft sink	0	±	0	*52	±	37
61	Deck by stbd sink	0	±	0	21	±	35
	Wet Lab (Figure 6)						
62	Deck inside fwd door	0	±	0	34	±	36
63	Aft sink area	0	±	0	3	±	101
64	Stbd benchtop	0	±	0	10	±	38
65	Deck inside port doors	0	±	0	27	±	38
66	Deck inside stbd doors	0	±	0	40	±	36
67	Aft Benchtop	26	±	42	13	±	31

Sample #	Sample Identification	^{3}H dpm/m^{2} activity	error	^{14}C dpm/m^{2} activity	error
	Aquarium Room (Figure 7)				
68	Deck by entrance to Aquarium room	0	± 0	1	± 0
69	Final bucket blank	0	± 0	5	± 42

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Most areas tested on the ship were free from radioisotope activity that requires cleaning. However, there was a small amount of radiocarbon in the inboard sink in the Bio Lab and on the deck by the sink in the Hydro Lab.

These should be cleaned before any natural tracer work is done. Tritium and radiocarbon contamination was also found in the radiation van, however no action is needed.

Figure 1
SWAB #681

R/V Nathaniel B. Palmer

Radioisotope Van #4

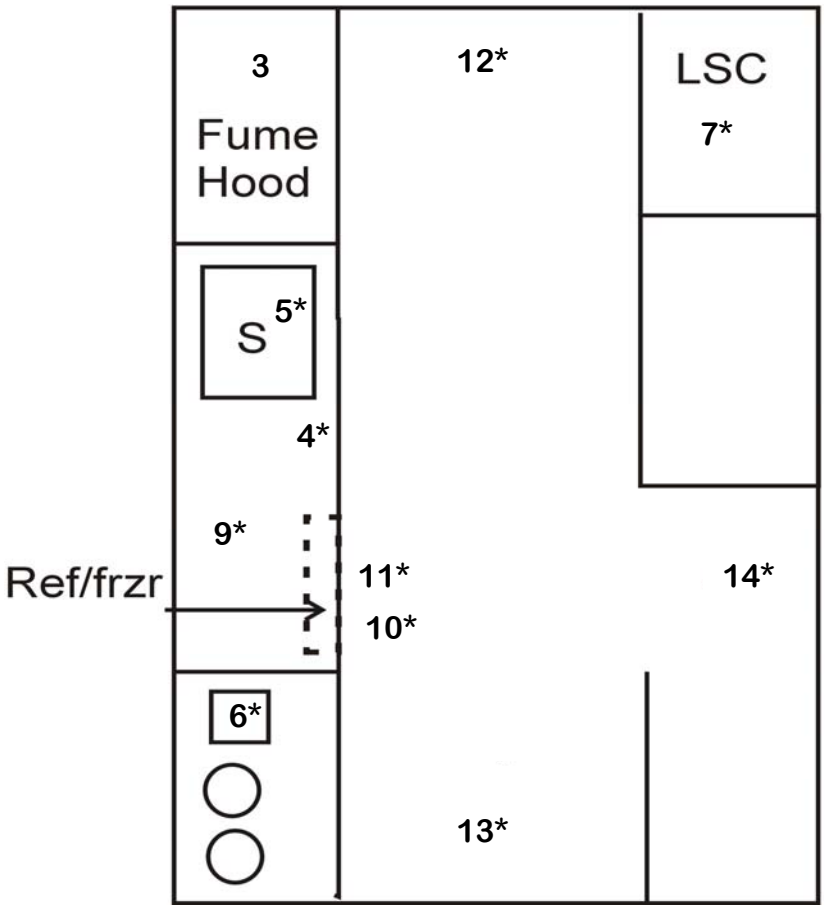
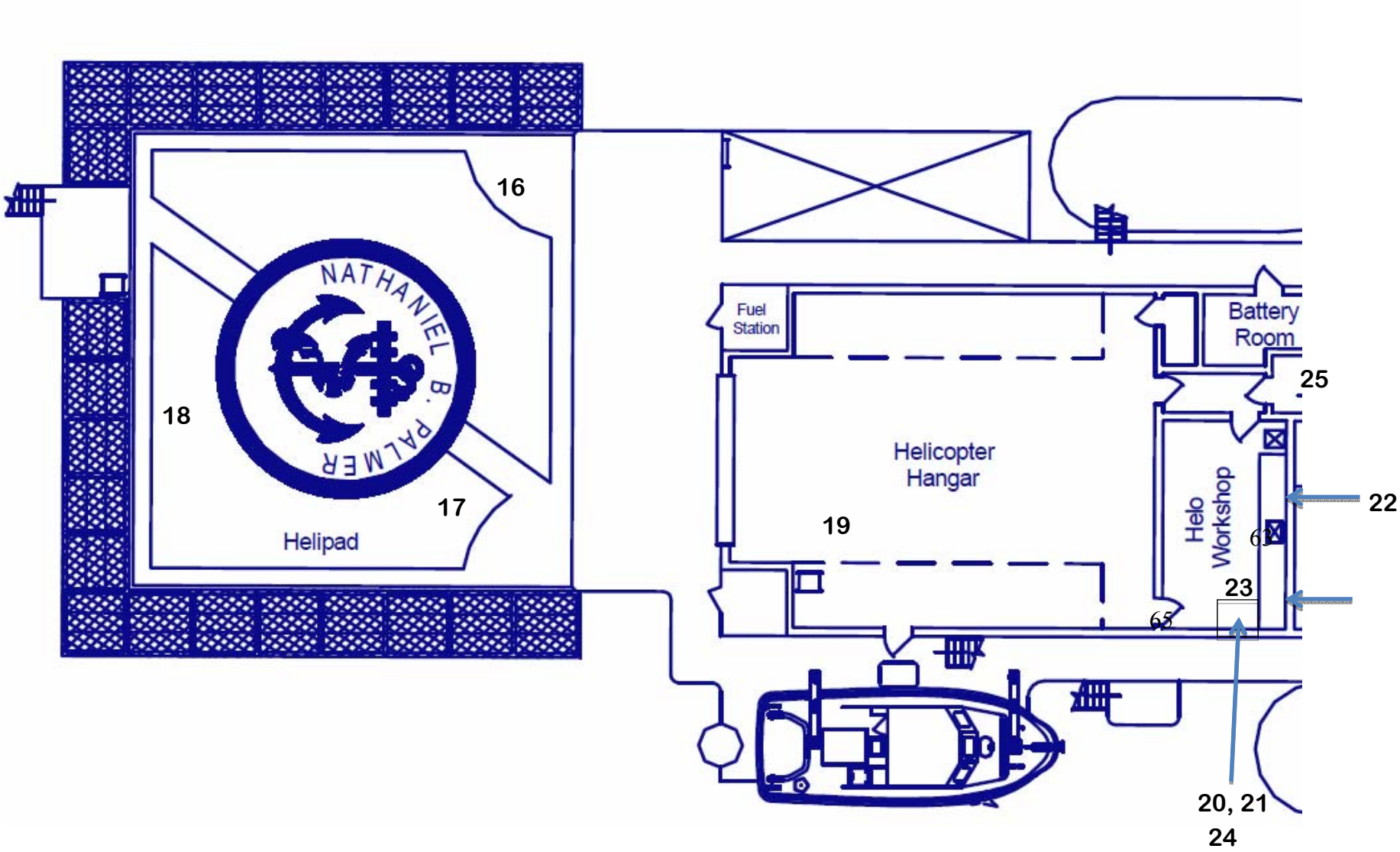
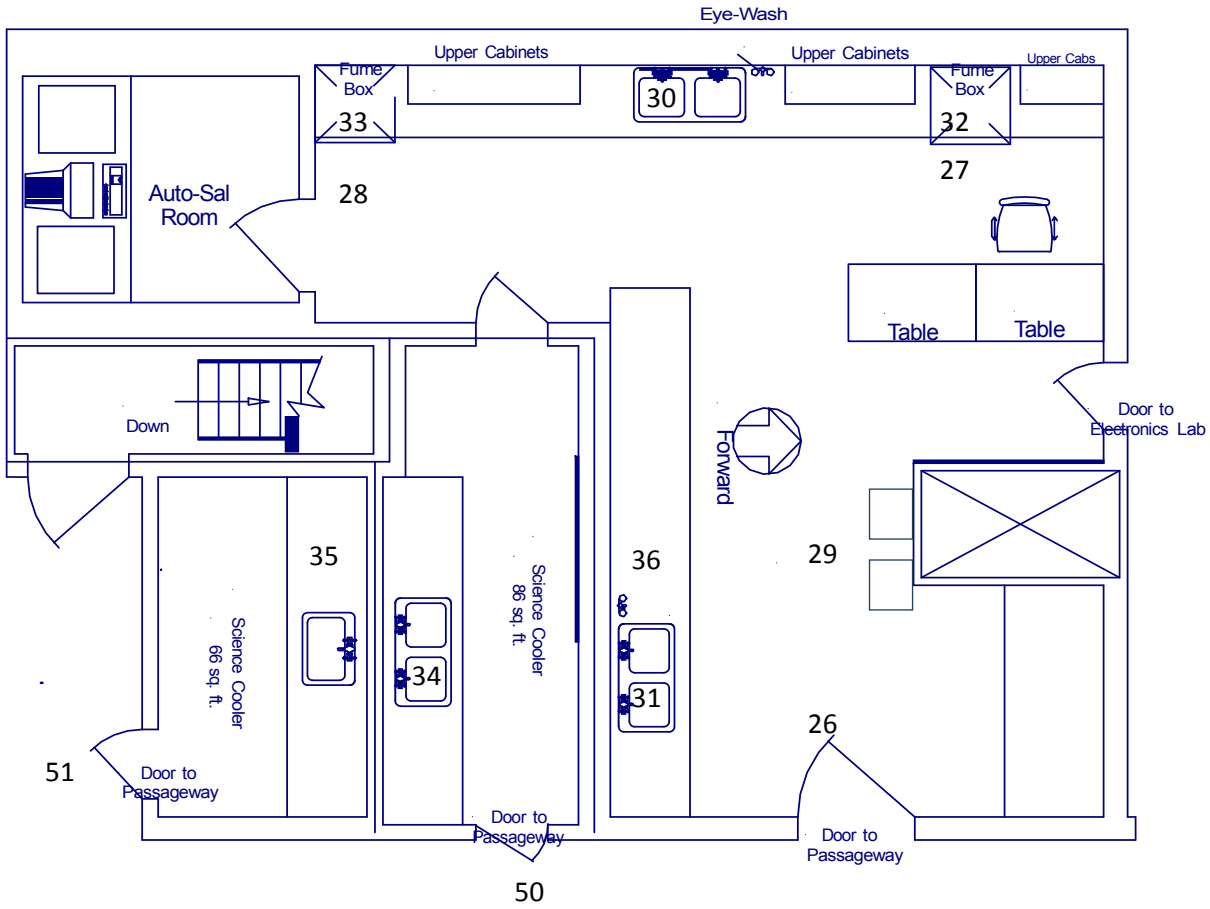


Figure 2 SWAB #681 Nathaniel B. Palmer



Bio Lab
460 sq. ft.

SWAB #681
Figure 3



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Aft Dry Lab
1036 sq. ft.

Figure 4

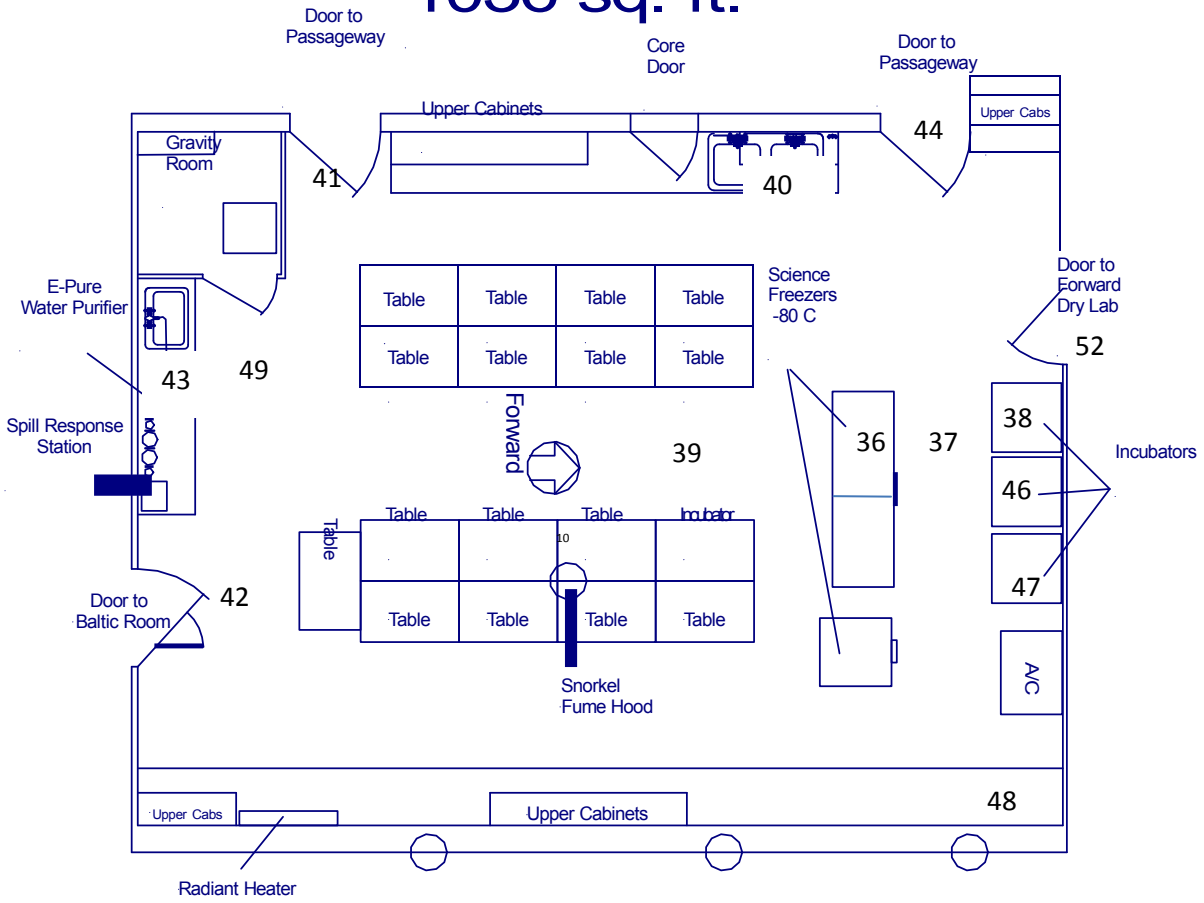

Figure 5 SWAB #681
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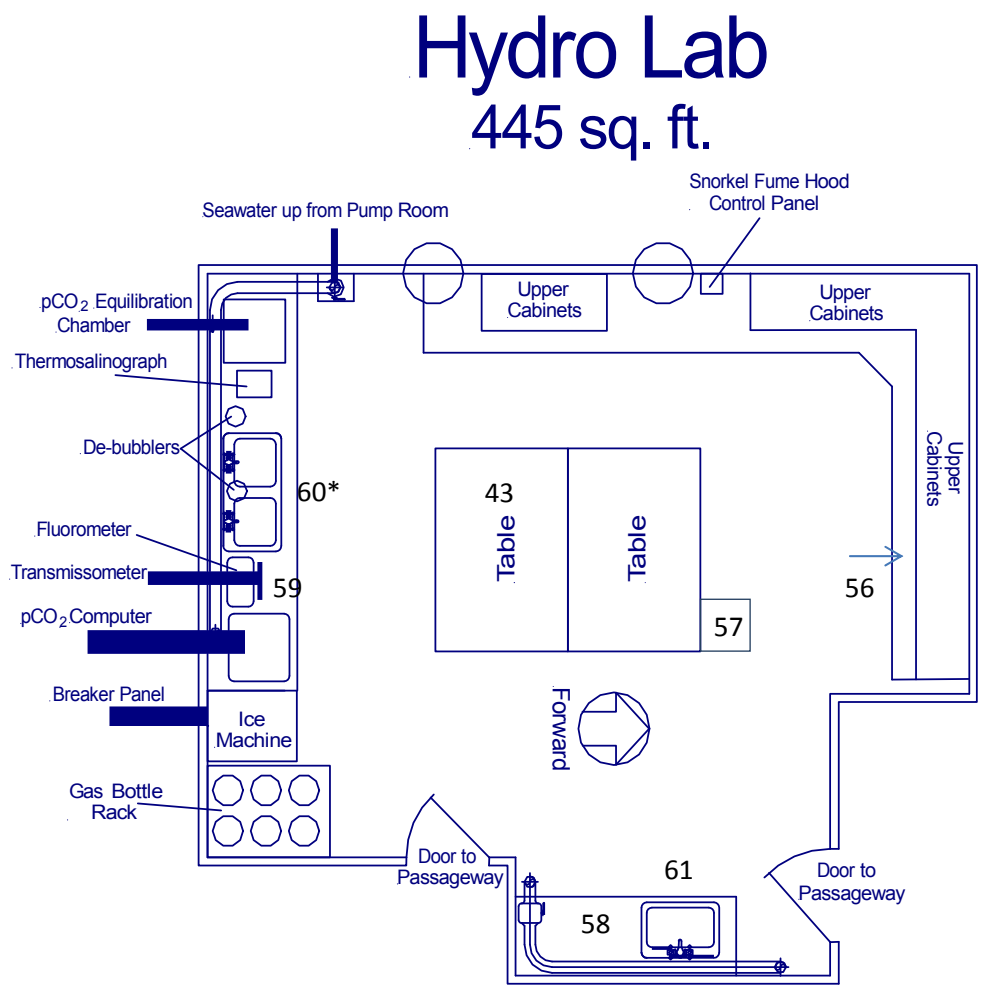

Figure 6 SWAB #681 Nathaniel B. Palmer

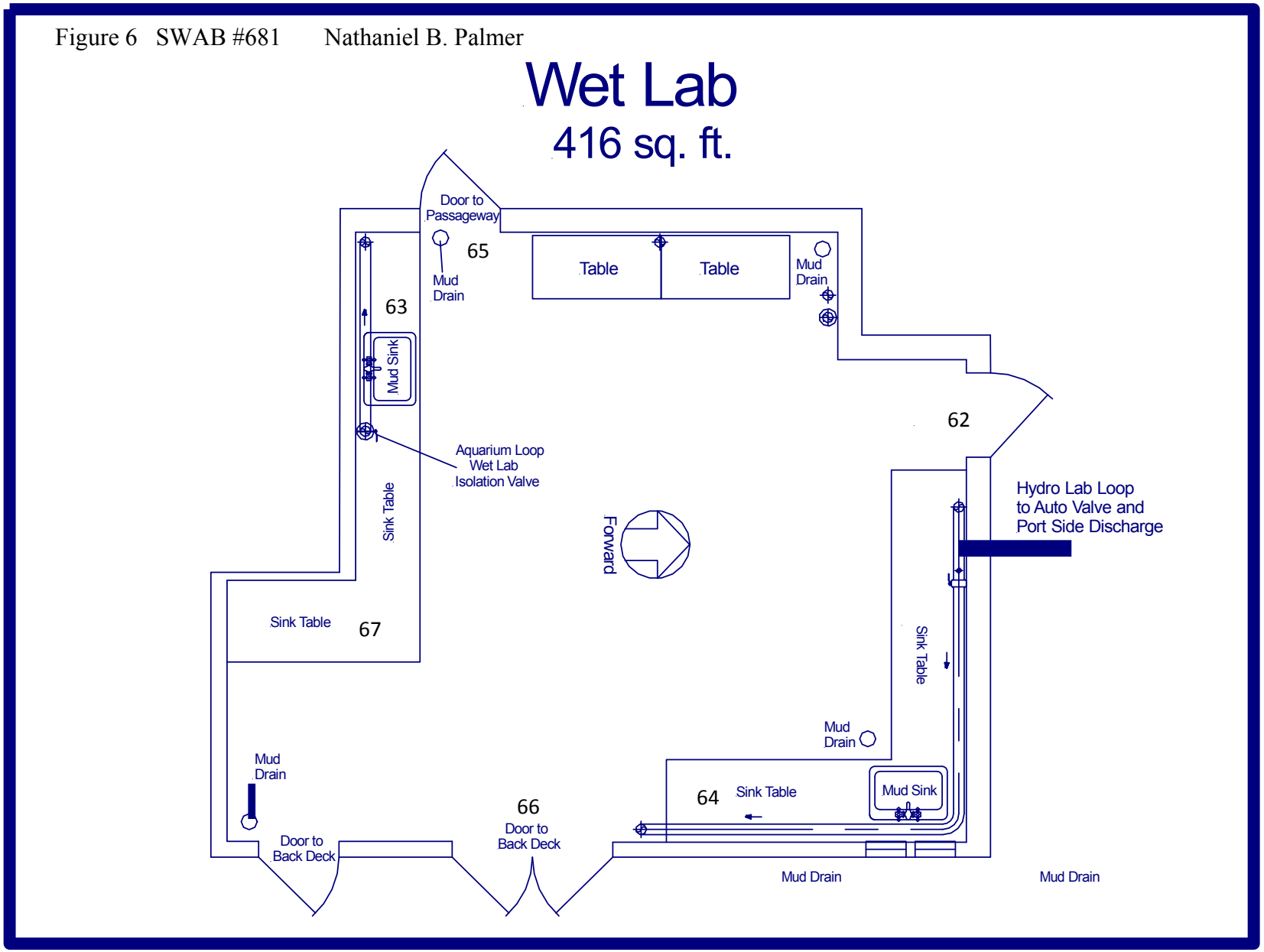

Figure 7
SWAB #681
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Aquarium Room
298 sq. ft.