

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

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SWAB REPORT # 765

SWAB DATE: 12 February 2015

R/V LM Gould

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
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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 $1000 \text{ dpm}/\text{m}^2$ 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 # 765

LOCATION: Punta Arenas, Chile
VESSEL: *LM Gould*

DATE: 12 February 2015
TECHNICIAN: J. Lennon

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	41	± 41	7	± 26
<u>Radiation Van #2 (Figure 1)</u>					
3	Outside door on deck	52	± 60	-29	± 0
4	Deck inside door	*785	± 85	46	± 20
5	Deck in front of LSC	*1799	± 122	*67	± 17
6	Deck in front of waste collection	*2130	± 131	*103	± 20
7	Countertop near hood	74	± 39	48	± 34
8	Inside hood	54	± 32	*62	± 36
9	Floor in front of hood	*749	± 84	58	± 23
10	Countertop next to refrigerator	30	± 51	-9	± 0
11	Inside refrigerator	85	± 36	*82	± 36
<u>Radiation Van #1 (Figure 2)</u>					
12	Outside door on deck	53	± 57	-23	± 0
13	Deck inside door	*2049	± 128	16	± 5
14	Deck by LSC	*1852	± 123	-17	± 8
15	Deck in front of sink	*5613	± 204	*57	± 7
16	Countertop by hood	*591	± 82	5	± 5
17	Inside hood	*893	± 92	-5	± 4
18	Floor in front of hood	*4732	± 196	48	± 7
19	Countertop across from hood	207	± 59	-16	± 0
20	Countertop next to refrigerator	**43598	± 558	*519	± 17
21	Inside refrigerator	*1495	± 111	29	± 10
<u>Dry Lab (Figure 3)</u>					
22	Dry Lab Floor outside door	77	± 50	-5	± 0
23	Deck inside door to passageway	426	± 68	33	± 22
24	Deck inside door to E-Lab	280	± 63	-14	± 386
25	Deck in front of refrigerator	192	± 57	-2	± 7
26	Counter by sink	*714	± 82	37	± 18
27	Counter by CCTV	26	± 41	5	± 27
28	Forward table	41	± 39	19	± 32
29	Aft table	20	± 48	-4	± 0

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
	<u>Hydro Lab (Figure 4)</u>				
30	Deck outside door	39	± 51	-10	± 0
31	Deck inside door	99	± 49	6	± 19
32	Deck by thorium table	101	± 47	19	± 28
33	Thorium table top	20	± 38	8	± 31
34	Inside fume hood	0	± 75	8	± 36
35	Countertop near shower	16	± 41	6	± 31
36	Deck near shower	108	± 51	5	± 16
37	Countertop in forward corner	121	± 55	-18	± 0
	<u>Wet Lab (Figure 5)</u>				
38	Deck outside door	40	± 50	-9	± 0
39	Deck inside door to deck	148	± 54	-3	± 25
40	Deck inside door to passageway	108	± 52	-9	± 0
41	Deck outside door to passageway	43	± 69	-34	± 0
42	Table top inside door to deck	33	± 46	-3	± 0
43	Deck in front of sink	263	± 60	13	± 17
44	Table near sink (center)	49	± 49	-8	± 0
45	Table near sink (forward)	24	± 49	-5	± 0
	<u>Environmental Room (Figure 6)</u>				
46	Countertop	35	± 54	-14	± 0
47	Deck	98	± 51	-5	± 36
	<u>01 Deck (Figure 7)</u>				
48	01 Deck by waste collection	18	± 73	-16	± 0
49	Final bucket blank	38	± 43	3	± 20

Comments

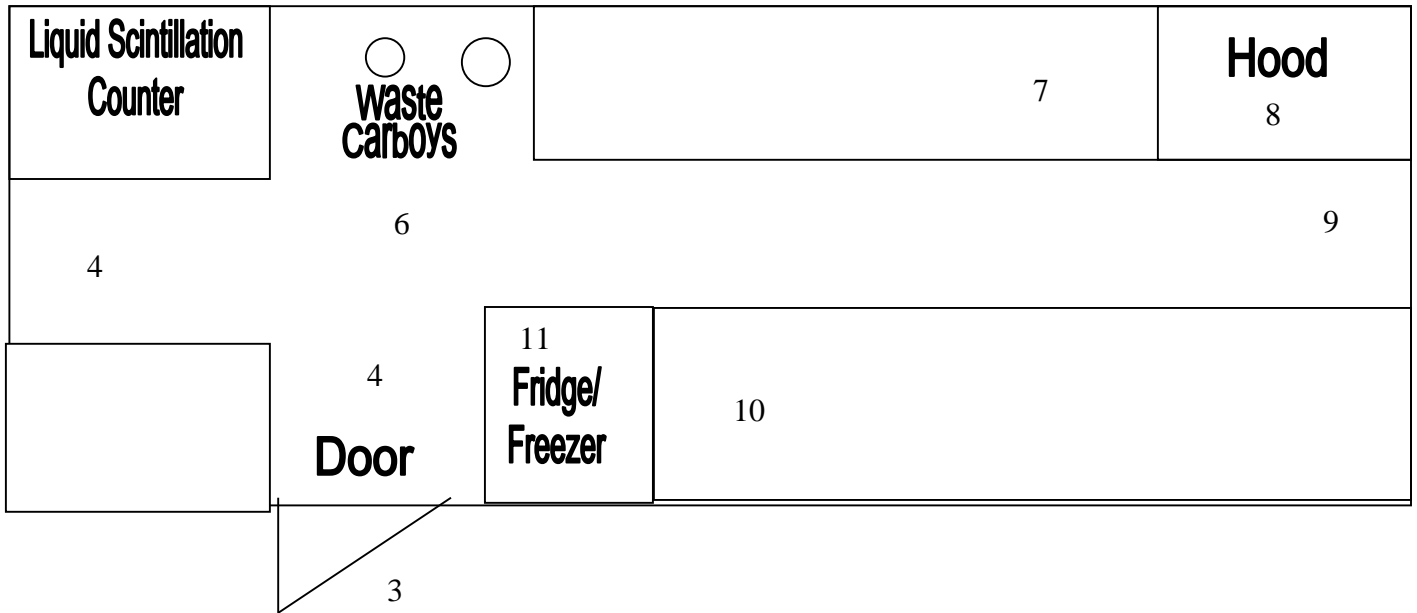
Please note that the error reported for each isotope is the two-standard deviation counting error.

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 negatives values to zero. Values are only significantly above background when they are positive and larger than the error.

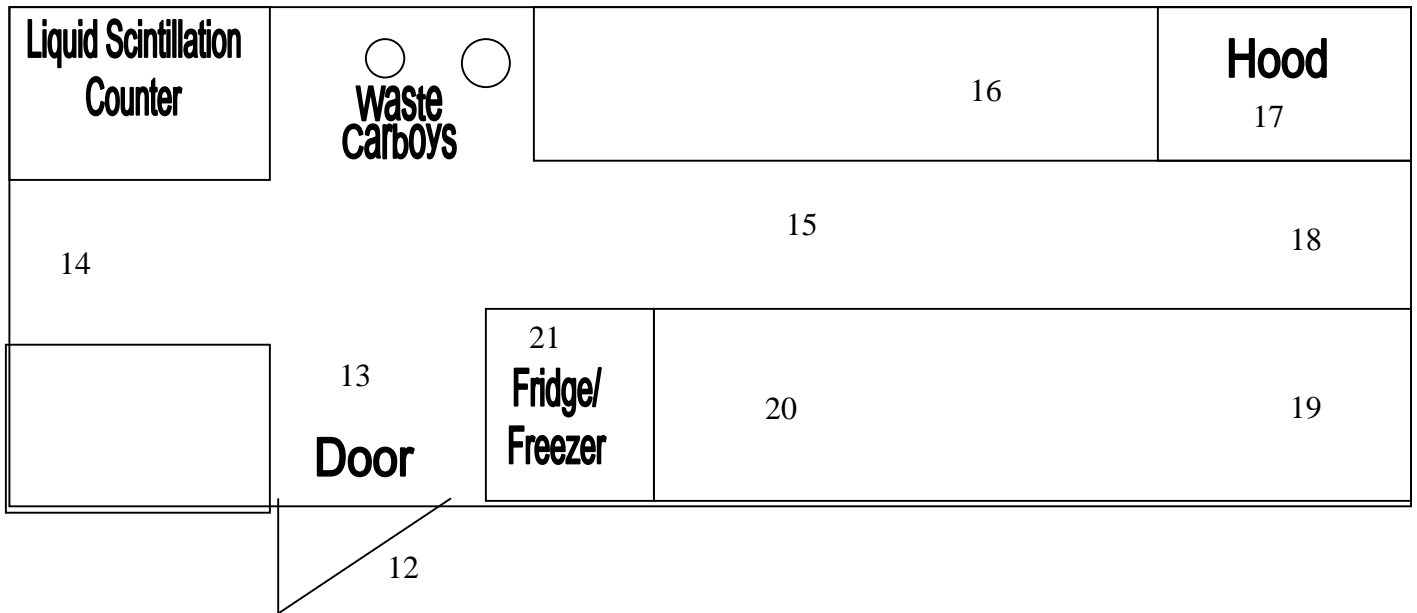
Radiation Van #2 had minor ^3H and ^{14}C contamination. No action is required, but we recommend cleaning deck areas to help prevent tracking contamination into the ship. Radiation Van #1 had minor to moderate ^3H and minor ^{14}C contamination. The countertop next to the refrigerator must be cleaned before any additional use.

It is recommend that deck areas also be cleaned to help prevent tracking contamination into the ship. All areas tested inside the ship were free from cantamination that requies cleaning except for the counter by the sink

USAP Van #2
SWAB #764
12 February 2015
Figure 1



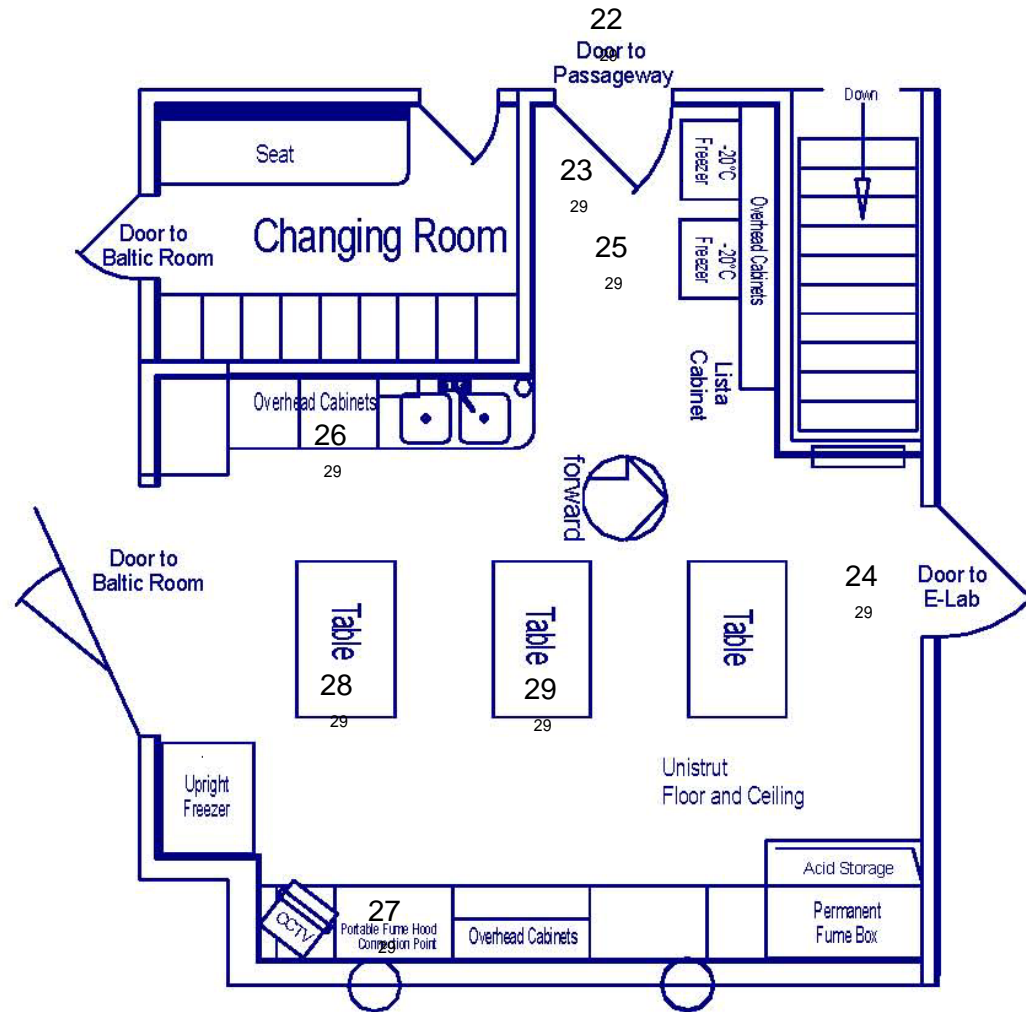
USAP Van #1
SWAB #764
12 February 2015
Figure 2



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Figure 3

Dry Lab

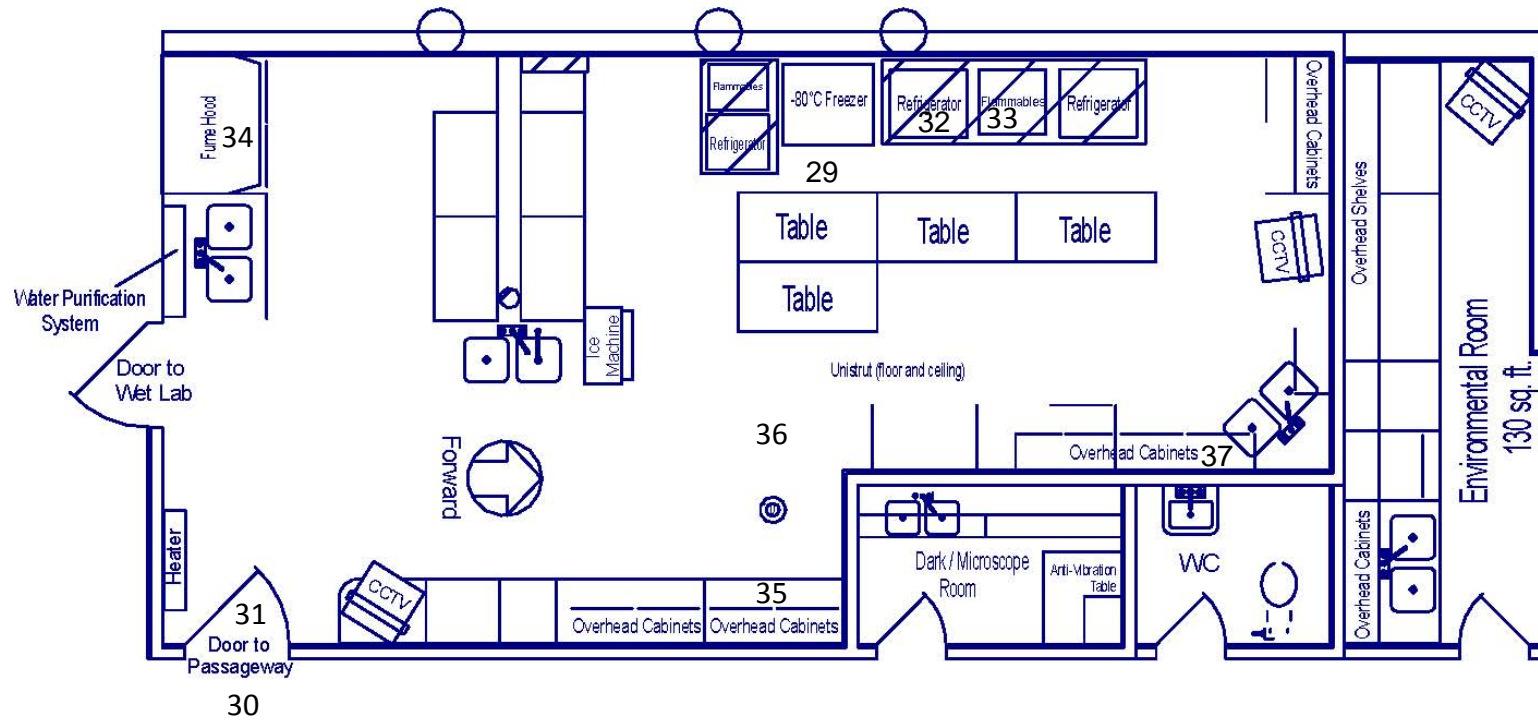
356 sq. ft.



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Figure 4

Hydro Lab

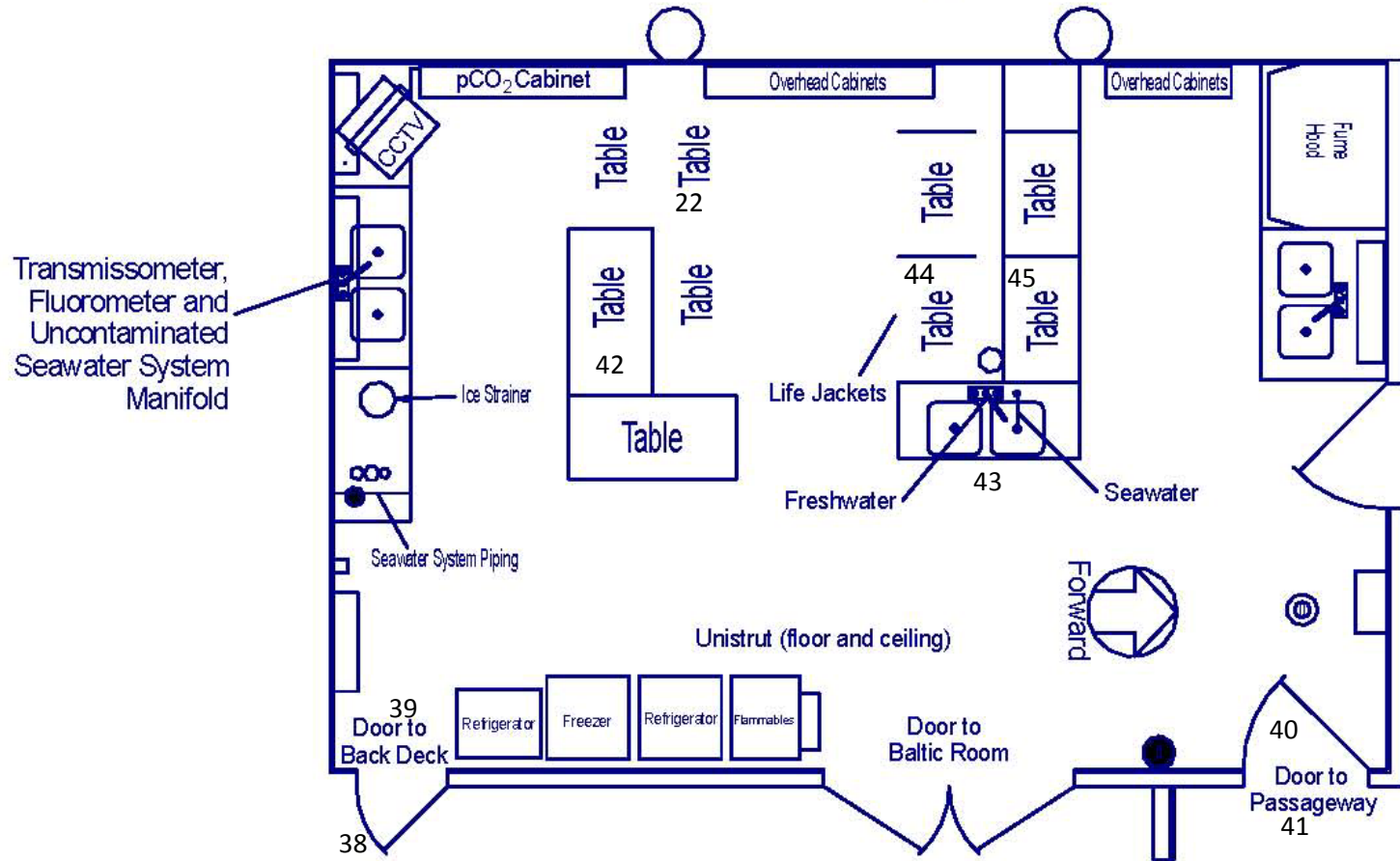
526 sq. ft.



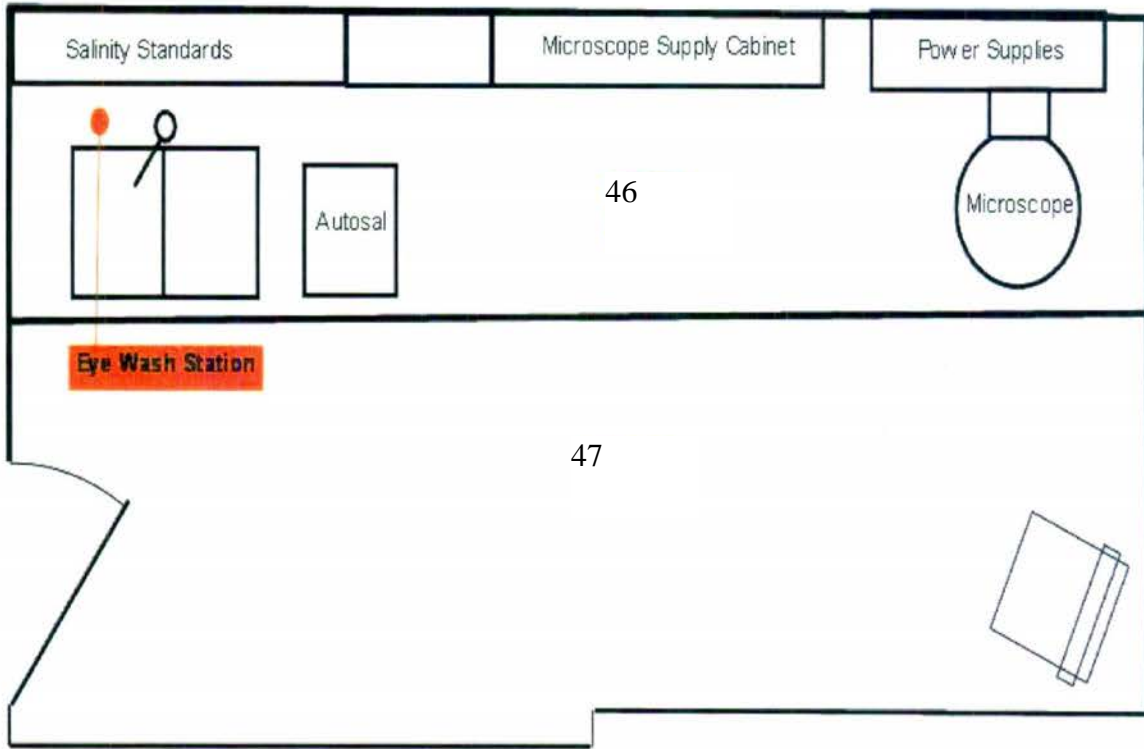
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Figure 5

Wet Lab

425 sq. ft.



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Figure 6



ENVIRONMENTAL ROOM

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Figure 7

