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Tritium Laboratory
14 March 2017

SWAB REPORT # 856

SWAB DATE: 9 February 2017

R/V Laurence M. Gould

James Happell

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Date: 2017.03.14 15:21:26 -04'00'

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Jamee Johnson

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 # 856

LOCATION: Punta Arenas, Chile
VESSEL: *R/V Laurence M Gould*

DATE: 9 February 2017
TECHNICIAN: D. Hutt

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	2	±	108	-3	±	38
	<u>Environmental Room (Figure 1)</u>						
3	Bench	-33	±	72	16	±	42
4	Deck by microscope	-44	±	97	4	±	92
5	Deck under public phone	-76	±	167	27	±	44
	<u>Electronics Lab (Figure 2)</u>						
6	Deck in front of public tool bench	-39	±	86	1	±	9
7	Deck under public use computer	-31	±	68	23	±	40
	<u>Dry Lab (Figure 3)</u>						
8	Companionway entrance to Dry Lab	-38	±	84	8	±	50
10	Deck in front of freezers	-33	±	73	11	±	44
11	Deck in front of hood	4	±	56	-1	±	10
12	Deck betwen two middle benches	-7	±	64	27	±	38
13	Decj under forward desk	-50	±	111	27	±	42
14	Aft middle benchtop	-49	±	109	33	±	41
20	Float Coat Room deck	-93	±	204	34	±	44
	<u>Hydro Lab (Figure 4)</u>						
9	Companionway entrance to Hydro Lab	-70	±	153	*50	±	41
15	Deck in front of hood	-18	±	39	31	±	39
16	Deck under desk of rad user	-55	±	121	6	±	71
17	Middle benchtop adjacent to ice machine	-41	±	90	12	±	45
18	Deck by forward filtering station	-12	±	27	15	±	39
19	Forward middle benchtop	-30	±	66	11	±	43
	<u>Wet Lab (Figure 5)</u>						
21	Deck in front of hood	-45	±	99	9	±	51
22	Middle benchtop	-41	±	91	-1	±	7
23	Deck in front of incubator	-57	±	125	-11	±	37
24	Deck by aft exit	-60	±	132	14	±	47
25	Inside under bench refrigerator	-45	±	98	16	±	43

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
	Radiation Van 2 (Figure 6)						
26	Main deck outside Rad Van 2 door	-31	±	67	15	±	41
27	Deck just inside door of Rad Van 2	51	±	49	18	±	32
28	Port bench top	-26	±	15	*277	±	46
29	Starboard bench top	-20	±	69	*75	±	40
30	Deck between benches	137	±	48	*196	±	43
31	Deck by hood	29	±	10	*342	±	48
32	Deck in front of waste and LSC	125	±	38	*199	±	42
	Radiation Van 1 (Figure 7)						
33	Main deck outside Rad Van 1 door	-25	±	54	22	±	40
34	Deck inside Rad Van 1 door	412	±	74	9	±	11
35	Starboard benchtop	409	±	72	2	±	3
36	Port benchtop	200	±	63	-8	±	90
37	Deck between benches	*3870	±	152	*65	±	13
38	Deck in front of hood by waste	*1490	±	143	29	±	12
39	Deck in front of LSC	387	±	83	-4	±	10
40	Deck under MLT desk	-45	±	99	26	±	41
41	Deck in front of entrance to MT shop	-55	±	121	46	±	41
42	01 Deck in front of waste drums	-39	±	86	*132	±	42
43	01 Deck in front of incubator	bottle was missing			bottle was missing		
44	01 Deck inside watertight door	-29	±	63	6	±	51
45	01 Deck outside public head	-35	±	76	3	±	80
46	Main deck in front of Hazmat Locker	-75	±	165	13	±	53
47	Deck outside rad users door	15	±	50	4	±	31
48	Deck in lounge under conference table	-45	±	98	8	±	51
49	Deck outside door of MPC office	-6	±	13	8	±	38
50	Deck in Galley by hand washing sink	-59	±	129	4	±	181
51	Final bucket blank.	-22	±	37	-9	±	32

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. Samples #9 and #42 from inside the ship had minor ^{14}C contamination. These areas should be cleaned ASAP. Rad Van 2 had minor ^{14}C contamination. Rad Van 1 had minor ^{3}H and ^{14}C contamination. No action is necessary in the Rad Vans, although we recommend cleaning the deck of Van 1.

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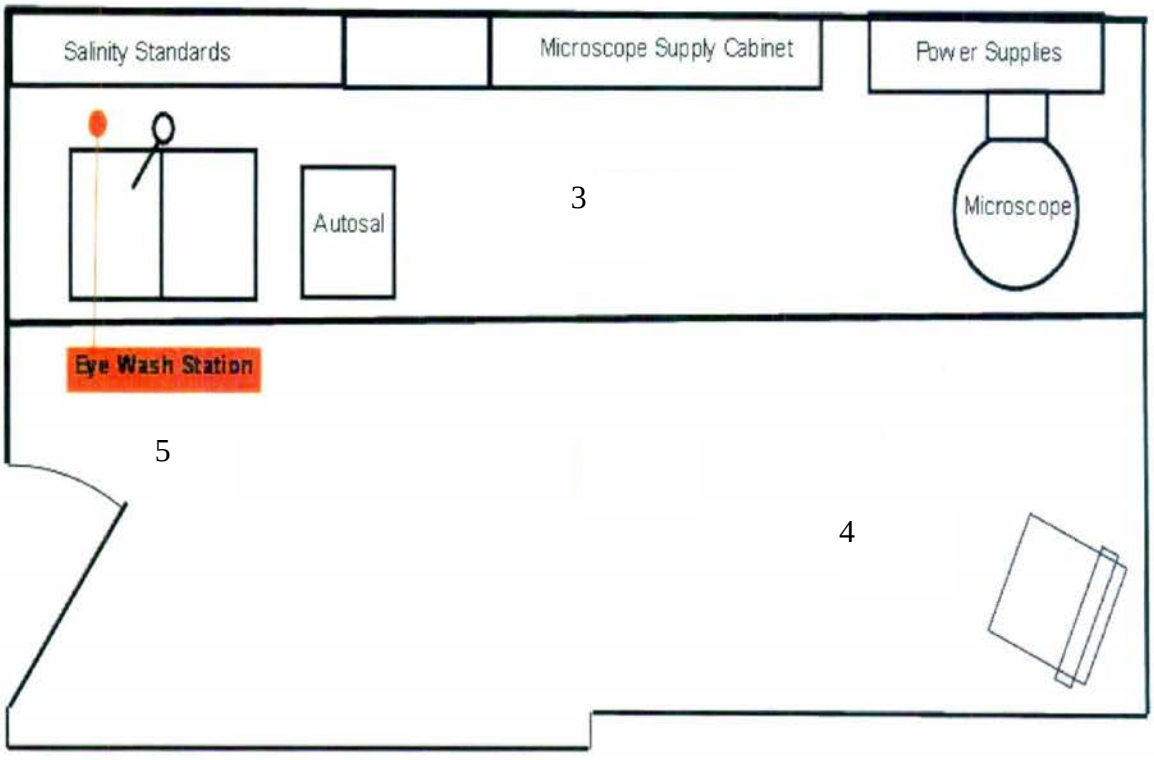
Figure 1



ENVIRONMENTAL ROOM

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Figure 2

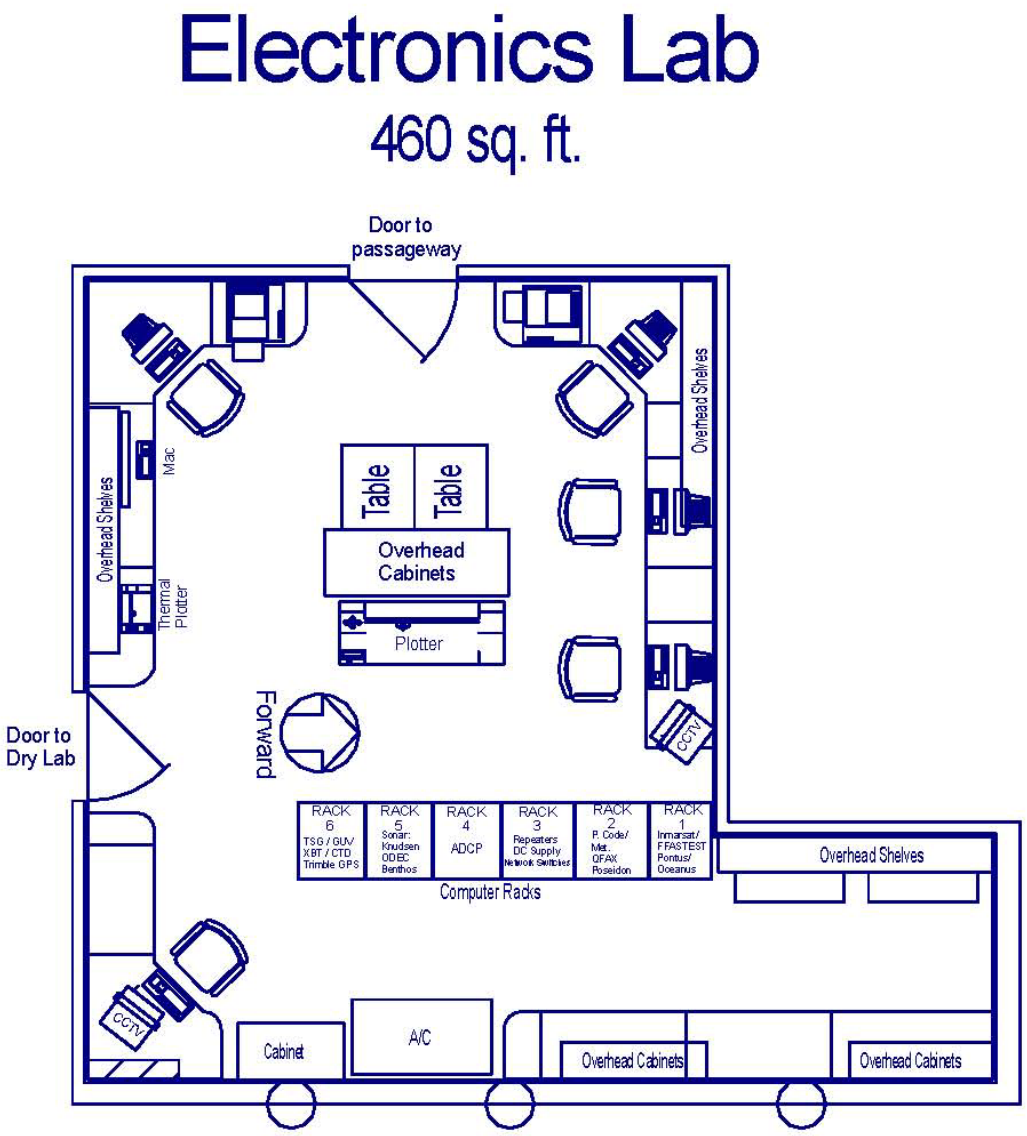

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Figure 3

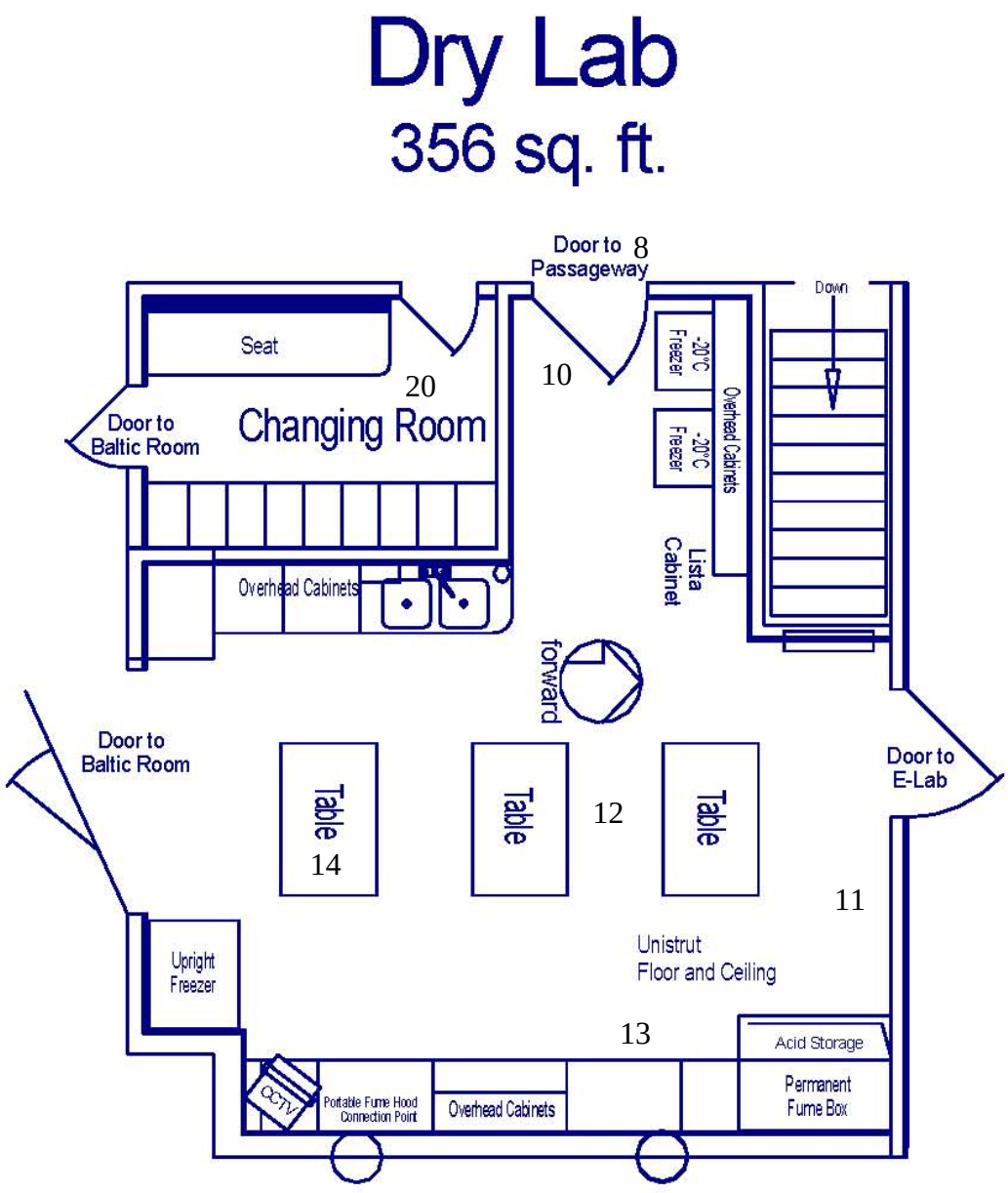

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Figure 4

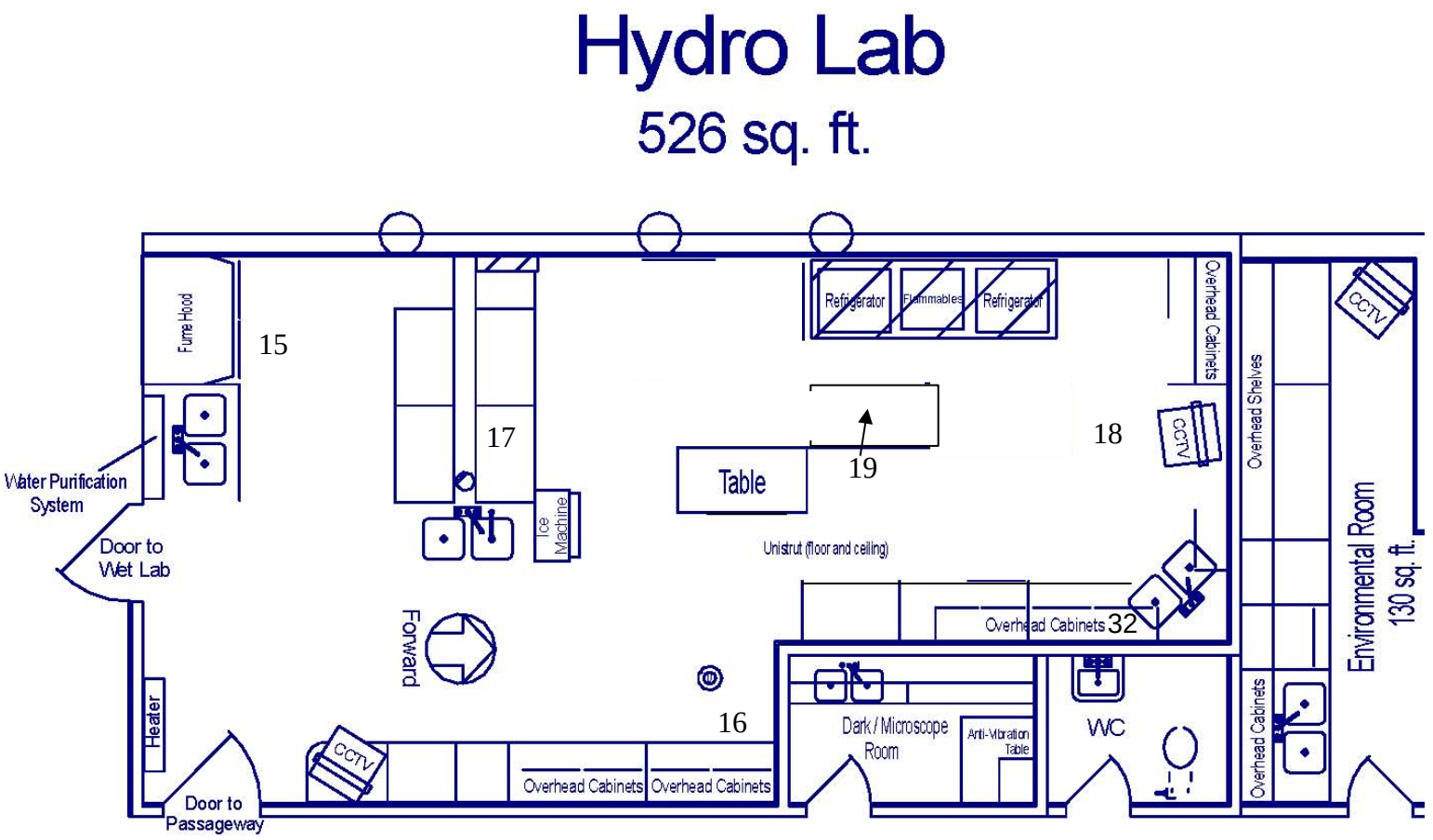

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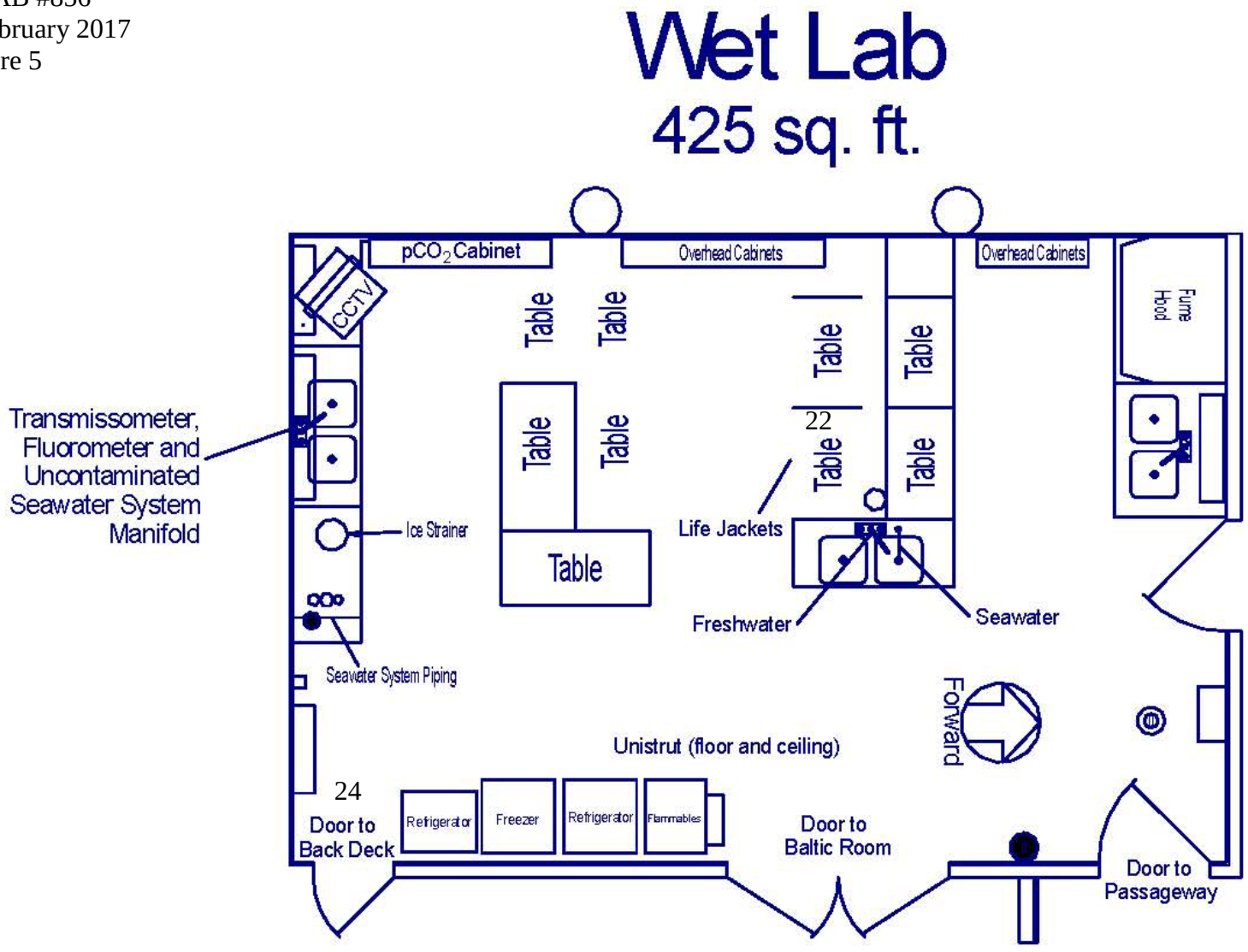
Figure 5



USAP Van #2
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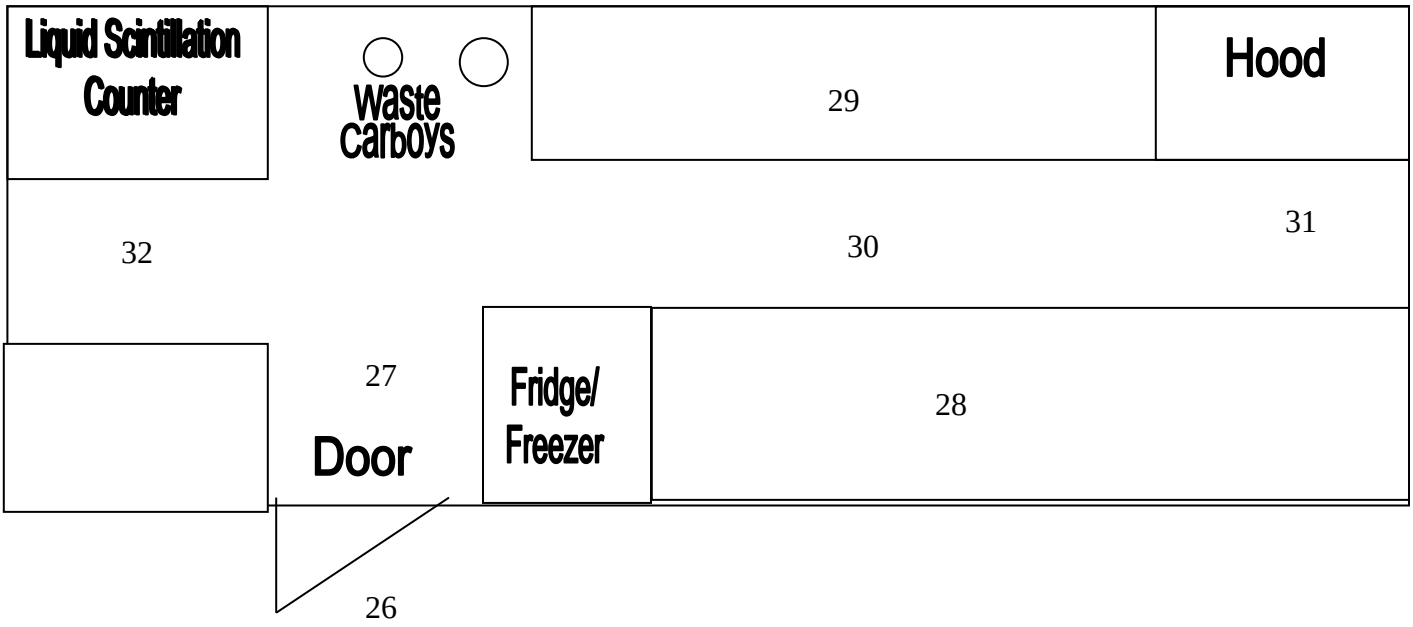
Figure 6



USAP Van #2
SWAB #856
9 February 2017
Figure 6

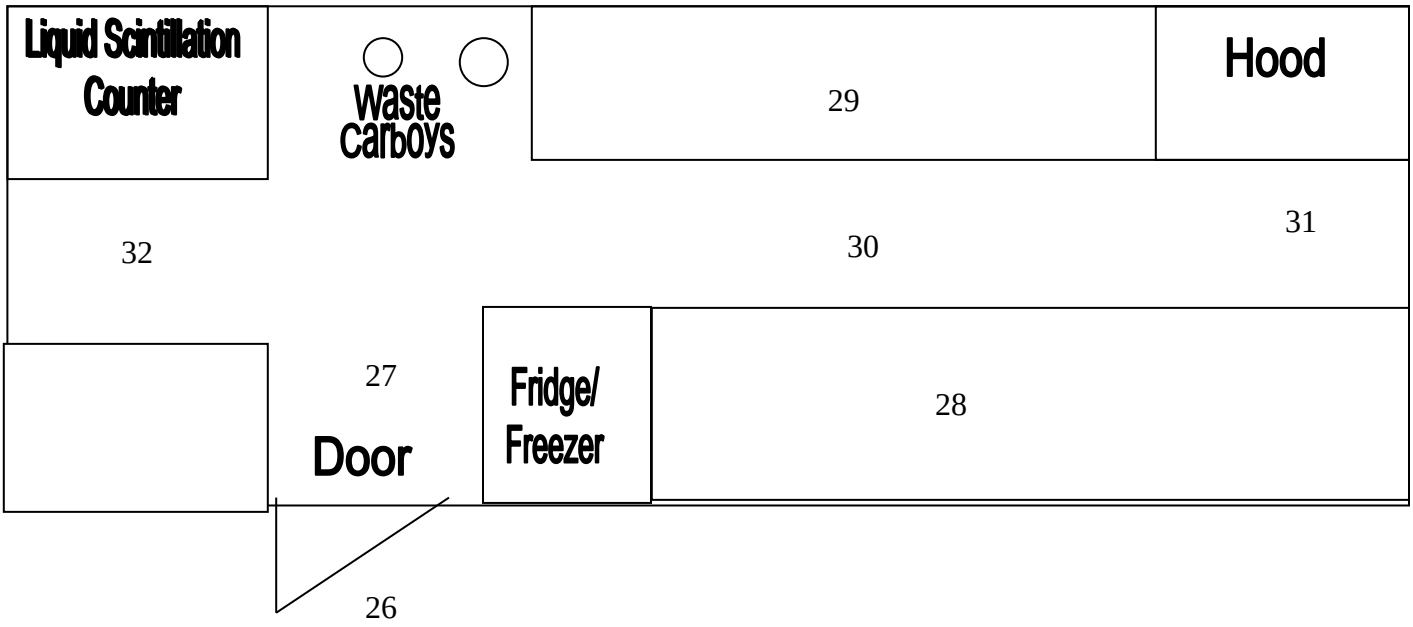


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Figure 8