



Tritium Laboratory  
15 May 2024

SWAB REPORT #1089

SWAB DATE: 2 May 2024

*R/V Atlantis & Radioisotope Van #625.6.03*

---

James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Sarah Fuller

## COMMENTS TO SWAB REPORTS

12 May 2014

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 contact your institution's radiation safety office.

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

REPORT FOR SWAB #1089

LOCATION: San Diego, CA  
VESSEL/LAB: R/V Atlantis

DATE: 2 May 2024  
TECHNICIAN: Charlene Grall

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 background	0 ±	0	0 ±	0
2	Initial bucket blank	-1 ±	1	32 ±	12
	<u>Wet Lab (Figure 1)</u>				
3	Starboard benchtop	-12 ±	12	10 ±	12
4	Inside fume hood	3 ±	5	19 ±	11
5	Port Benchtop	4 ±	14	4 ±	10
6	Forward benchtop and sink	-2 ±	5	20 ±	12
7	Deck in center of lab	-39 ±	27	7 ±	14
	<u>Hydro Lab (Figure 2)</u>				
8	Deck inside starboard entrance	-15 ±	13	27 ±	12
9	Deck in front of port sink	-13 ±	13	14 ±	12
10	Deck between starboard sink and fume hood	12 ±	12	26 ±	12
11	Inside port Cospolich freezer	9 ±	13	13 ±	11
12	Inside starboard Cospolich refrigerator	11 ±	11	26 ±	12
13	Port sink area	-21 ±	20	20 ±	12
14	Inside ALVIN hanger at base of stairs to 01 deck	-5 ±	11	33 ±	13
	<u>Bio-Analytical Lab (Figure 3)</u>				
15	Deck inside aft entrance	13 ±	10	18 ±	11
16	Aft sink area	-27 ±	21	19 ±	11
17	Inside Cospolich refrigerator	17 ±	21	6 ±	9
18	Inside Frigidaire refrigerator	-13 ±	13	26 ±	12
19	Forward sink area	-12 ±	12	22 ±	12
20	Starboard benchtop	-45 ±	31	39 ±	14
21	Deck inside starboard entrance	23 ±	19	15 ±	11
22	Port benchtop	3 ±	5	24 ±	12
23	Inside fume hood	5 ±	6	26 ±	12
24	Forward benchtop	-13 ±	13	20 ±	12
25	Benchtop across from forward sink	9 ±	11	21 ±	11
26	Benchtop across from aft sink	7 ±	8	29 ±	12
27	Benchtop adjacent to aft sink	-11 ±	135	28 ±	12
	<u>Walk-in Coolers (Figure 4)</u>				
28	Deck of forward cooler	13 ±	11	32 ±	12
29	Deck of aft cooler	-27 ±	0	21 ±	12
30	Deck inside companionway	17 ±	14	27 ±	12









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
<u>Main Lab (Figure 5 )</u>					
31	Inside starboard Frigidaire freezer	-16 ±	13	21 ±	12
32	Inside starboard Frigidaire refrigerator	-8 ±	40	26 ±	12
33	Benchtop aft of starboard sink	10 ±	15	10 ±	10
34	Deck inside forward port entrance	-27 ±	19	27 ±	13
35	Benchtop adjacent to port sink	-4 ±	9	29 ±	12
36	Forward port benchtop	-16 ±	13	8 ±	12
37	Deck inside port entrance aft of port sink	-10 ±	97	24 ±	12
38	Starboard benchtop forward of ice machine	-22 ±	18	26 ±	13
39	Starboard sink area and adjacent benchtop	4 ±	18	1 ±	9
40	Deck inside aft entrance	-12 ±	19	25 ±	12
41	Inside fume hood	2 ±	4	22 ±	12
<u>Computer Lab (Figure 4 )</u>					
42	Deck inside starboard entrance	-6 ±	32	22 ±	12
43	Deck inside forward entrance	-6 ±	12	35 ±	13
44	Intermediate bucket sample	-15 ±	12	21 ±	12
<u>Miscellaneous areas (Figure 4)</u>					
45	Deck inside Science Storeroom	-25 ±	20	24 ±	13
46	Deck inside Ship Office	-4 ±	9	5 ±	11
<u>Radioisotope Van #625.6.03 (Figure 6)</u>					
47	Inside fume hood	420 ±	52	250* ±	22
48	Benchtop adjacent to sink	105 ±	31	24 ±	10
49	Benchtop next to LSC	233 ±	43	32 ±	10
50	Sink area	193 ±	43	60* ±	13
51	Benchtop across from underbench refrigerators	424 ±	54	119* ±	16
52	Benchtop across from fume hood	298 ±	49	32 ±	9
53	Inside Hotpoint freezer next to fume hood	198 ±	41	20 ±	8
54	Inside Hotpoint refrigerator next to fume hood	656* ±	68	102* ±	14
55	Inside Haier refrigerator under bench	523* ±	60	137* ±	16
56	Inside ATVIO fridge under bench	3084* ±	149	153* ±	13
57	Deck in front of fume hood	1406* ±	100	366* ±	25
58	Deck between sink and sticky blue tape	1360* ±	113	366* ±	25
59	Deck outside van entrance	79 ±	24	112* ±	17
60	Final bucket sample	12 ±	19	4 ±	9

### 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

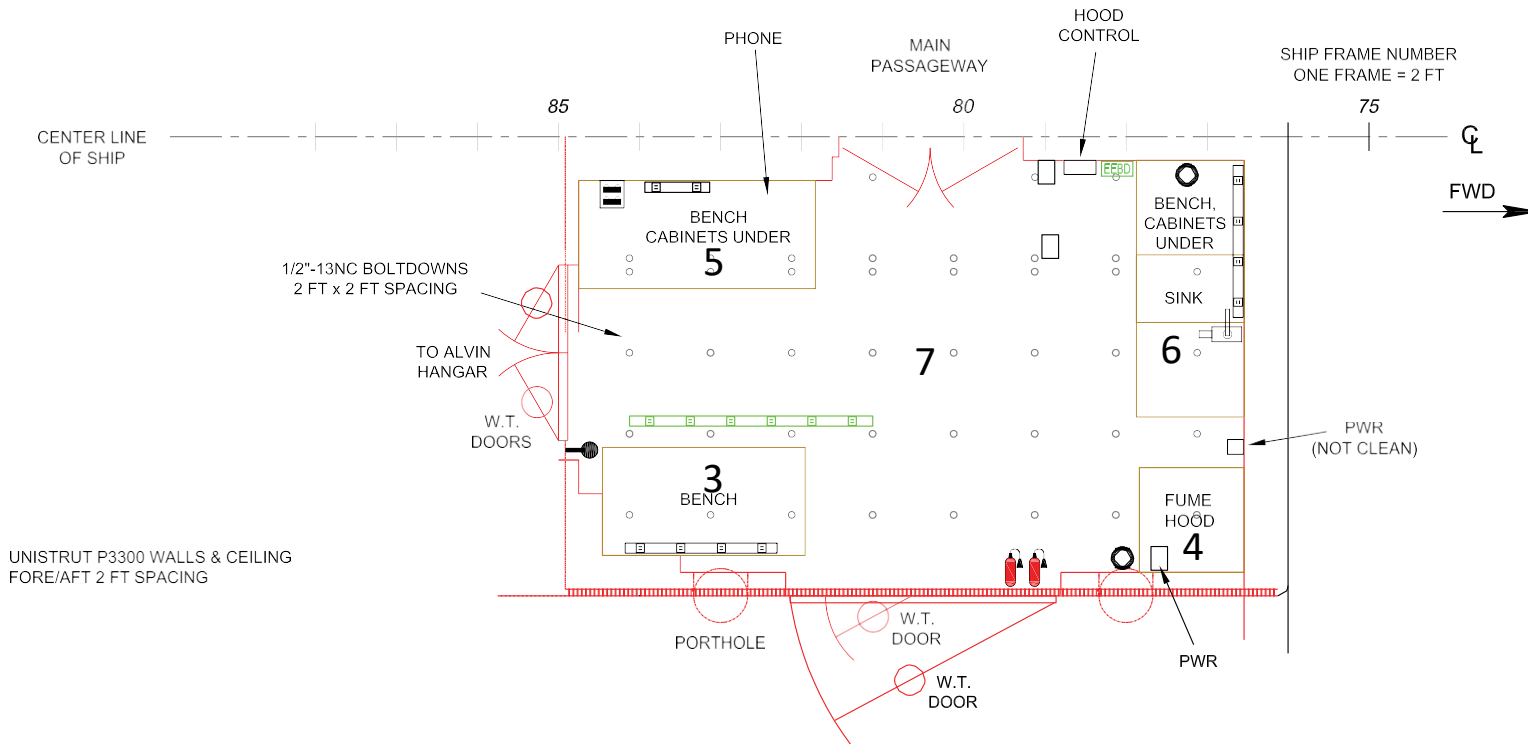
distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas on board the ship were free from isotope contamination that requires cleaning. The Rad Van had minor  $^3\text{H}$  and  $^{14}\text{C}$  contamination, but no cleaning required.

**KEY**

-  COMPUTER HUB
-  SHIP EQUIP -KEEP CLEAR
-  EMERGENCY ESCAPE BREATHING DEVICE
-  72" POWER STRIP, 6 PLUGS
-  FIRE EXTINGUISHER
-  SCIENCE SEA WATER
-  CABLE PASS THRU
-  COMPRESSED AIR

UNISTRUT:  
 BULKHEADS  
 2 FT SPACING  
 OVERHEAD FORE/AFT,  
 FULL LENGTH OF LAB  
 ALL POWER CLEAN UNLESS NOTED

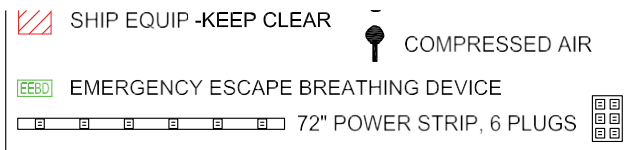
**Figure 1**  
**SWAB 1089**  
 2 May 2024



UNISTRUT P3300 WALLS & CEILING  
 FORE/AFT 2 FT SPACING

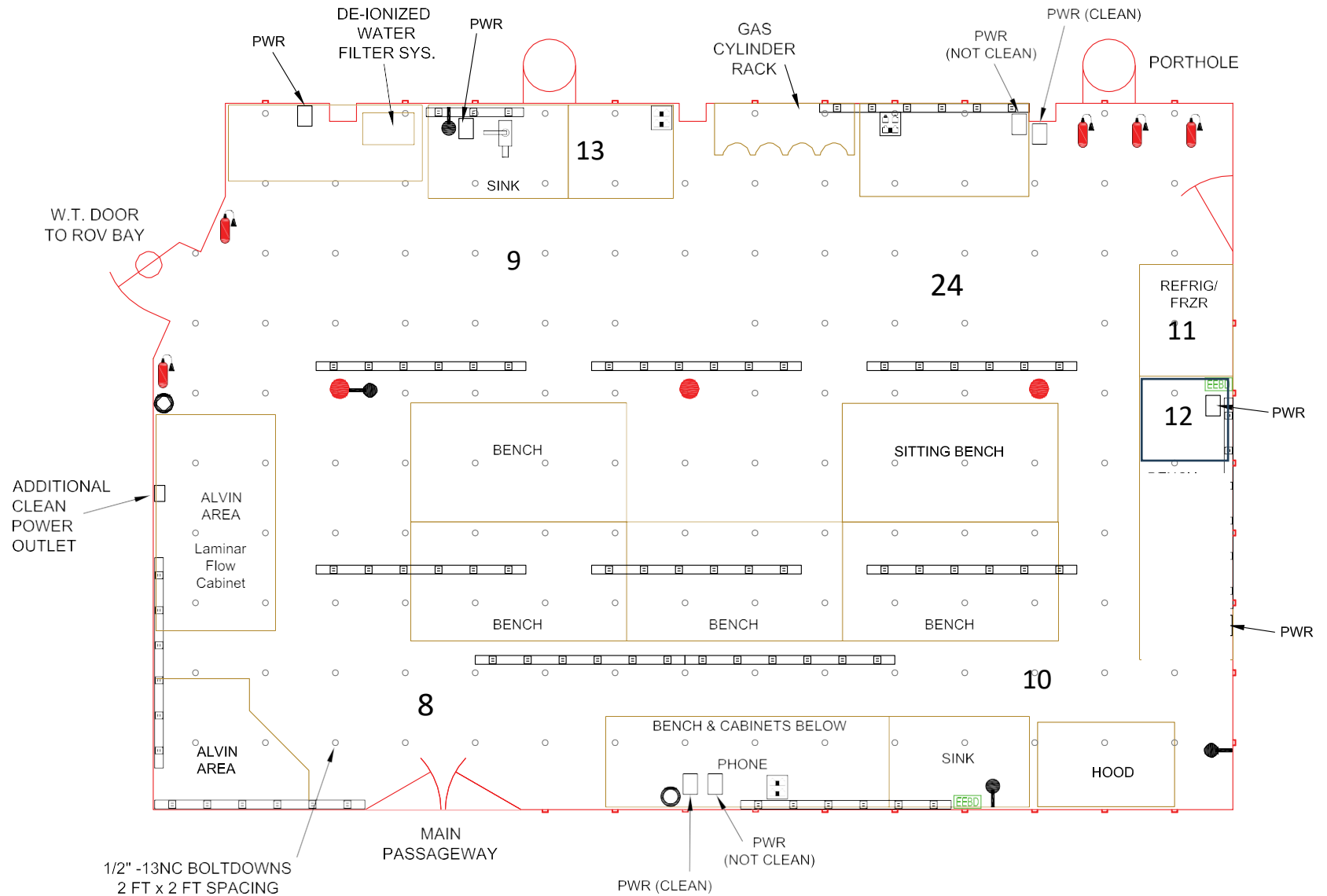
**WET LABORATORY**  
*Atlantis Main Deck, Rm 1-76-1*

Figure 2  
SWAB 1089  
2 May 2024



FULL LENGTH OF LAB  
ALL POWER CLEAN UNLESS NOTED

14



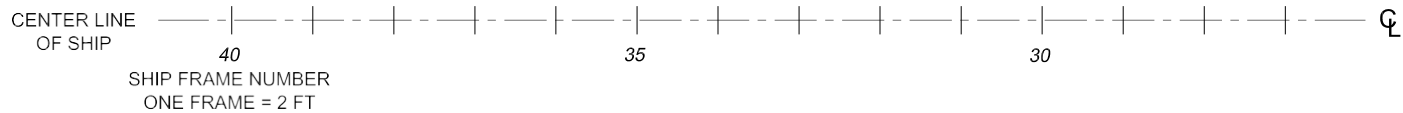
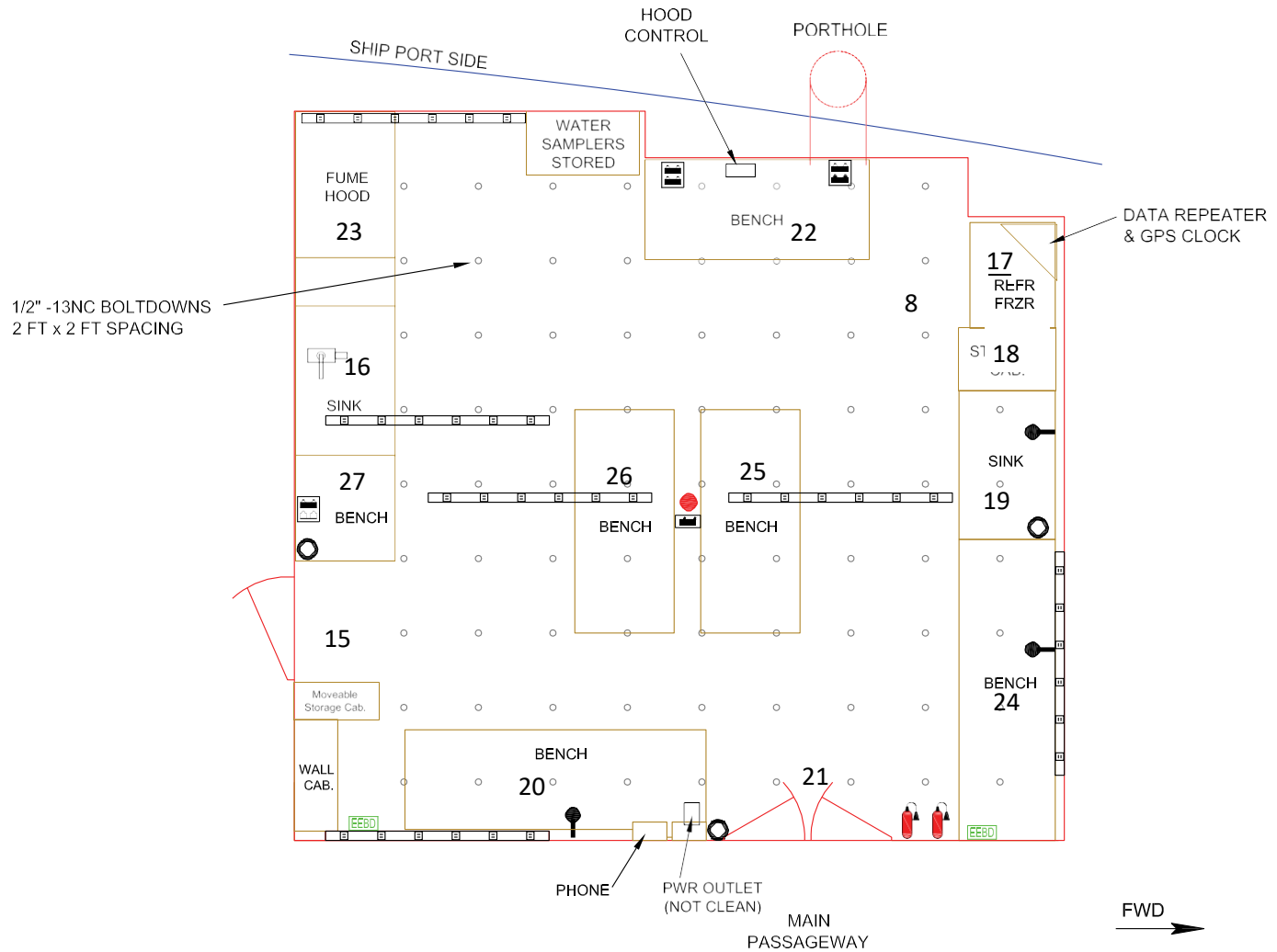
**HYDROGRAPHIC LABORATORY**  
*Atlantis Main Deck, Room 1-64-2*

**KEY**

-  COMPUTER HUB
-  SHIP EQUIP -KEEP CLEAR
-  EMERGENCY ESCAPE BREATHING DEVICE
-  72" POWER STRIP, 6 PLUGS
-  FIRE EXTINGUISHER
-  SCIENCE SEA WATER
-  CABLE PASS THRU
-  COMPRESSED AIR

**Figure 3**  
**SWAB 1089**  
**2 May 2024**

UNISTRUT:  
BULKHEADS  
2 FT SPACING  
OVERHEAD FORE/AFT,  
FULL LENGTH OF LAB  
  
ALL POWER CLEAN UNLESS NOTED

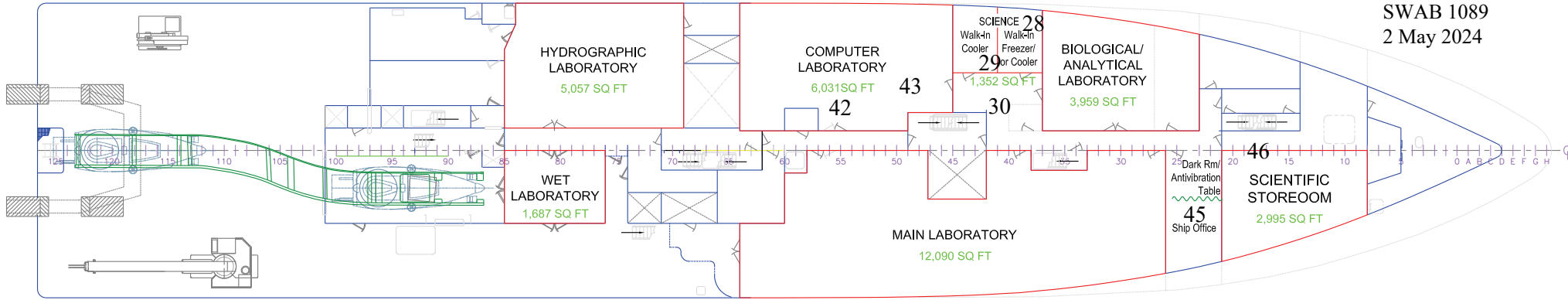


**BIOLOGICAL/ANALYTICAL CLEAN LABORATORY**





Figure 4  
 SWAB 1089  
 2 May 2024



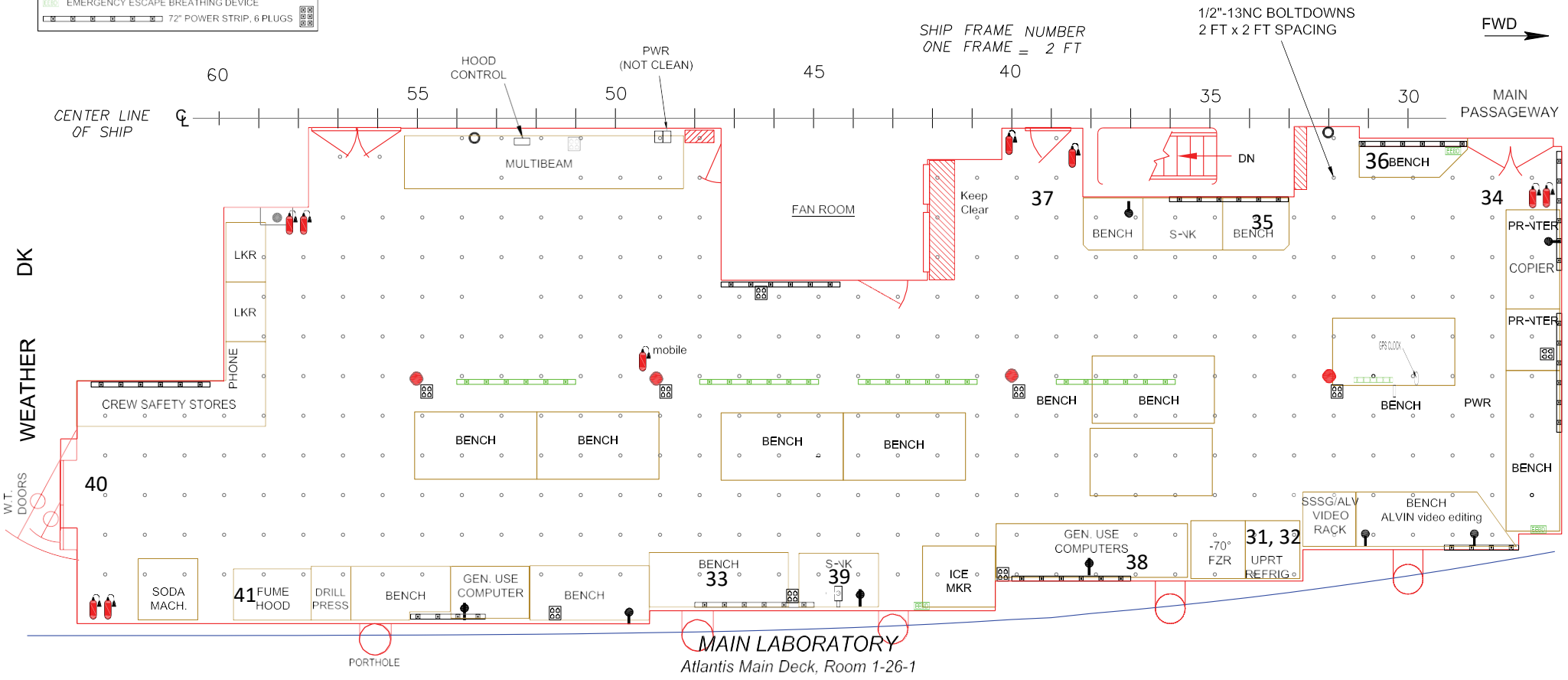
*Laboratories & Scientific Storeroom General Locations  
 Atlantis Main Deck*

Figure 5  
SWAB 1089  
2 May 2024

**KEY**

- FIRE EXTINGUISHER
- SCIENCE SEA WATER
- COMPUTER HUB
- SHIP EQUIP - KEEP CLEAR
- EMERGENCY ESCAPE BREATHING DEVICE
- 72" POWER STRIP, 6 PLUGS
- UNISTRUT
- BULKHEADS
- 2 FT SPACING
- OVERHEAD FORE/AFT
- FULL LENGTH OF LAB
- CABLE PASS THRU
- COMPRESSED AIR

UNISTRUT.  
BULKHEADS  
2 FT SPACING  
OVERHEAD FORE/AFT.  
FULL LENGTH OF LAB  
ALL POWER CLEAN UNLESS NOTED



**MAIN LABORATORY**  
Atlantis Main Deck, Room 1-26-1



# WHOI RADIOISOTOPE VAN

55\*

#625.6.03

Figure 6  
SWAB # 1089  
2 May 2024

