



Tritium Laboratory  
29 March 2023

SWAB REPORT #1057

SWAB DATE: 19 March 2023

*R/V Atlantis and WHOI Rad Van #2408-02*

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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 # 1057

LOCATION: Puntarenas, Costa Rica  
VESSEL/LAB: *R/V Atlantis*

DATE: 19 March 2023  
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 Bkgnd	0	± 0	0	± 0
2	Initial bucket blank	3	± 149	-5	± 30
	<u>Main Lab (Figure 1)</u>				
3	Port sink area and adjacent benchtop	-14	± 19	2	± 13
4	Deck below mid-port entrance	3	± 19	1	± 8
5	Deck below forward port entrance	1	± 4	-18	± 20
6	Forward benchtop	-15	± 21	10	± 11
7	Center benchtop	-7	± 35	0	± 11
8	Deck in front of -80 °C freezer & refrigerator	-35	± 39	1	± 9
9	Benchtop between ice machine & -80 °C freezer	21	± 28	-9	± 10
10	Deck forward of starboard sink	-12	± 17	-10	± 11
11	Starboard sink area and adjacent benchtop	-18	± 25	-14	± 16
12	Deck in front of starboard sink	-3	± 21	4	± 10
13	Inside fume hood	5	± 24	-12	± 13
14	Deck inside aft entrance	-5	± 25	0	± 28
15	Deck inside aft port entrance	-51	± 57	4	± 23
16	Inside chest freezer	-9	± 44	-12	± 14
17	Benchtop next to chest freezer	-15	± 21	-6	± 33
18	Deck between chest freezer and fan room	5	± 24	-20	± 23
19	Deck in front of port sink	-5	± 22	3	± 10
	<u>Bio Analytical Lab (Figure 2)</u>				
20	Port benchtop	9	± 44	-11	± 12
21	Forward sink area	4	± 27	-16	± 19
22	Forward benchtop	-2	± 16	-2	± 14
23	Benchtop across from forward sink	-27	± 30	-19	± 21

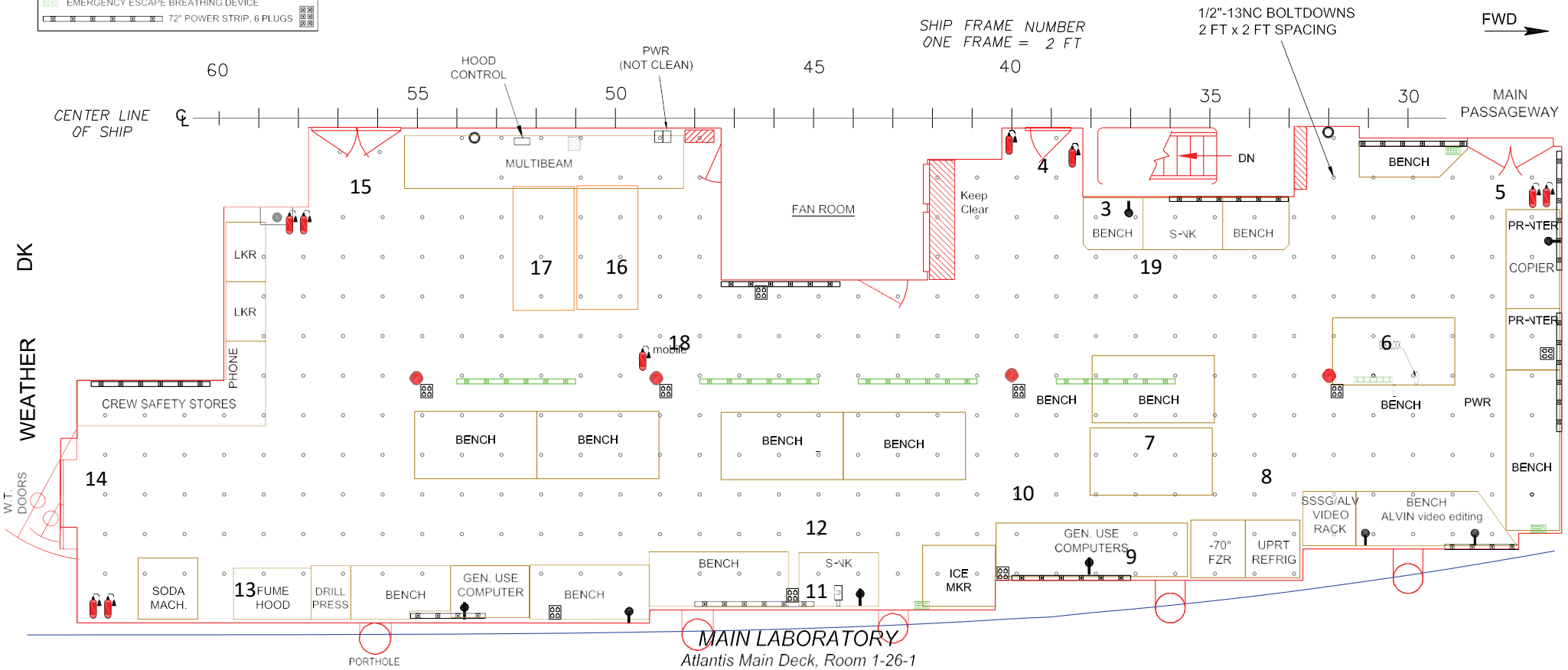
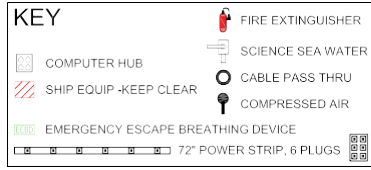
Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
24	Benchtop across from aft sink	2 ±	14	-12 ±	14
25	Starboard benchtop	-15 ±	21	-15 ±	18
26	Deck inside aft entrance	-36 ±	40	<b>15 ±</b>	<b>12</b>
27	Aft sink area	-2 ±	17	-8 ±	23
28	Inside fume hood	-7 ±	35	-3 ±	18
29	Deck between fume hood and aft sink	3 ±	22	-17 ±	19
30	Aft benchtop adjacent to aft sink	22 ±	26	-4 ±	20
31	Deck inside aft entrance	9 ±	20	3 ±	8
32	Inside Cospolich freezer	-16 ±	23	4 ±	12
33	Inside Cospolich refrigerator	30 ±	35	-21 ±	24
34	Inside Frigidaire refrigerator	14 ±	19	8 ±	9
35	Inside Frigidaire freezer	-37 ±	41	<b>15 ±</b>	<b>12</b>
36	Deck in front of refrigerators	-5 ±	25	-8 ±	21
	<u>Walk-in Coolers (Figure 3)</u>				
37	Deck of forward Cooler	12 ±	25	-2 ±	13
38	Benchtops of aft Cooler	-18 ±	25	-1 ±	7
39	Deck of aft Cooler	-6 ±	31	0 ±	6
40	Deck inside companionway	-30 ±	34	-2 ±	11
41	Intermediate bucket blank	12 ±	30	-7 ±	20
	<u>Computer Lab (Figure 4)</u>				
42	Deck inside starboard entrance	-36 ±	40	1 ±	7
	<u>Hydro Lab (Figure 5)</u>				
43	Deck below port sink	18 ±	24	0 ±	2
44	Deck below starboard sink	27 ±	30	-11 ±	12
45	Inside fume hood	-28 ±	32	4 ±	14
46	Deck inside starboard entrance	2 ±	22	0 ±	7
47	Inside Cospolish freezer	4 ±	20	1 ±	7
48	Inside Cospolish refrigerator	-12 ±	17	-9 ±	10
49	Inside Cospolish refrigerator	11 ±	50	-13 ±	15
50	Deck in front of Cospolish refrigerators	11 ±	26	-2 ±	9
51	Deck in front of forward port bench	16 ±	40	-15 ±	17
	<u>Wet Lab (Figure 6)</u>				
52	Forward sink area	2 ±	19	1 ±	9
53	Port benchtop	-1 ±	7	-8 ±	21
54	Starboard benchtop	4 ±	10	8 ±	10
55	Inside fume hood	-7 ±	34	2 ±	12
56	Deck in center of lab	-25 ±	28	-6 ±	31

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>Science Berthing (Figure 7)</u>				
57	Deck in head attached to room 2-57-1	10	± 24	0	± 4
58	Deck in head attached to room 2-49-1	15	± 18	8	± 9
59	Deck in head attached to room 2-31-1	-11	± 15	4	± 11
60	Deck in head attached to room 2-40-1	-33	± 37	5	± 14
	<u>Rad Van 2408.02 (Figure 8)</u>				
61	Sink area	<b>*762</b>	± 76	<b>21</b>	± 5
62	Benchtop adjacent to sink	<b>399</b>	± 57	<b>18</b>	± 6
63	Inside fume hood	<b>*1592</b>	± 110	<b>30</b>	± 5
64	Benchtop adjacent to fume hood	<b>482</b>	± 61	<b>34</b>	± 8
65	Benchtop adjacent to LSC	<b>144</b>	± 38	<b>14</b>	± 7
66	Inside Danby refrigerator	<b>129</b>	± 36	<b>8</b>	± 6
67	Inside Kenmore freezer	<b>245</b>	± 45	<b>17</b>	± 7
68	Deck in front of fume hood	<b>*1132</b>	± 95	<b>*146</b>	± 15
69	Deck between freezer/refrigerator	<b>*1422</b>	± 106	<b>*84</b>	± 10
70	Benchtop across from sink	<b>51</b>	± 25	<b>20</b>	± 10
71	Deck inside entrance	<b>359</b>	± 53	<b>*58</b>	± 11
72	Final bucket blank	-18	± 25	-6	± 35

### 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 tested on the ship were free of isotope contamination. Minor <sup>14</sup>C and <sup>3</sup>H contamination was found in the Rad Van. No action is necessary, but cleaning the deck of the Rad Van would help prevent tracking contamination out of the van.

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

**KEY**








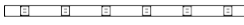

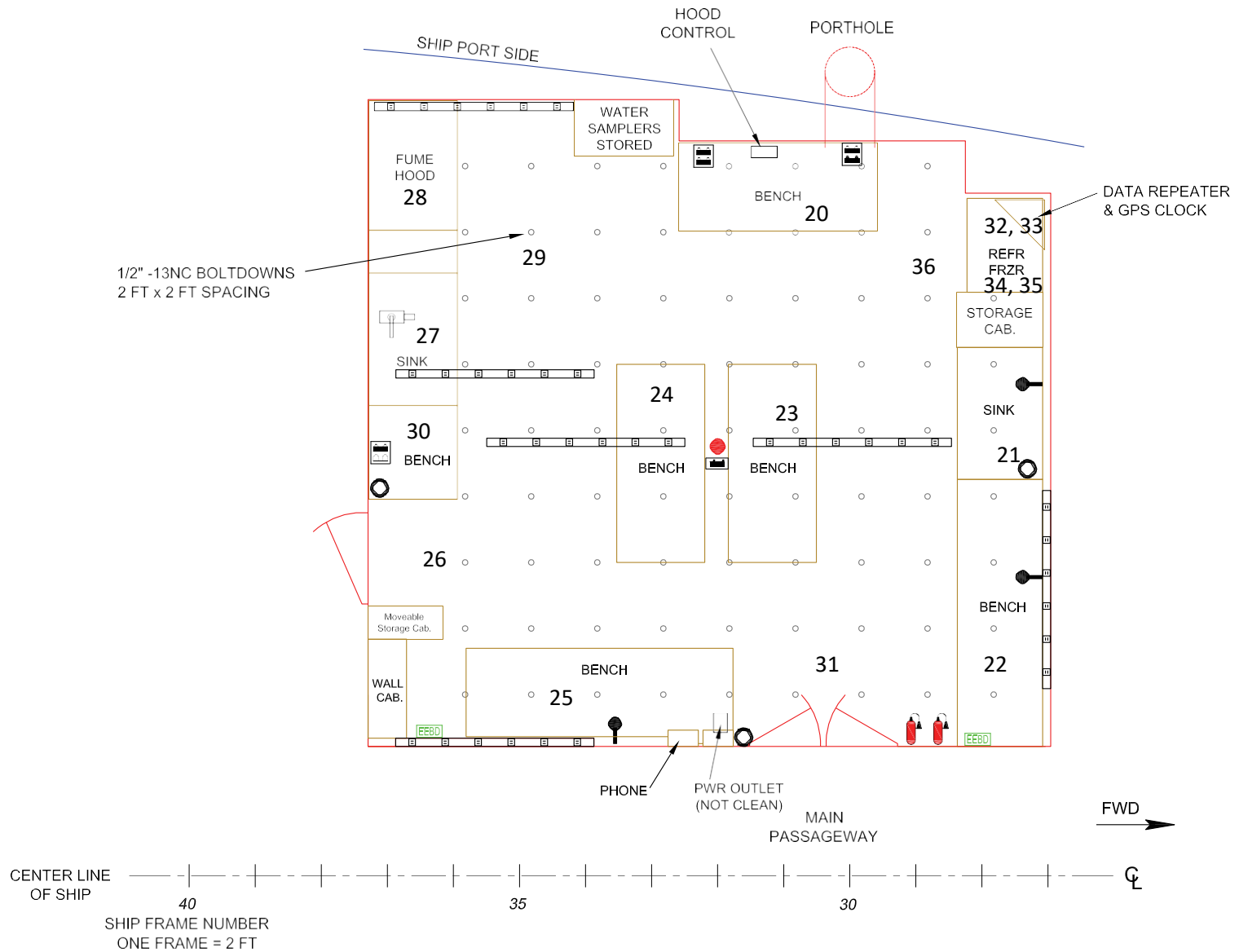
-  FIRE EXTINGUISHER
-  SCIENCE SEA WATER
-  COMPUTER HUB
-  CABLE PASS THRU
-  SHIP EQUIP -KEEP CLEAR
-  COMPRESSED AIR
-  EMERGENCY ESCAPE BREATHING DEVICE
-  72" POWER STRIP, 6 PLUGS
- 

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



**BIOLOGICAL/ANALYTICAL CLEAN LABORATORY**  
*Atlantis Main Deck, Room 1-27-2*

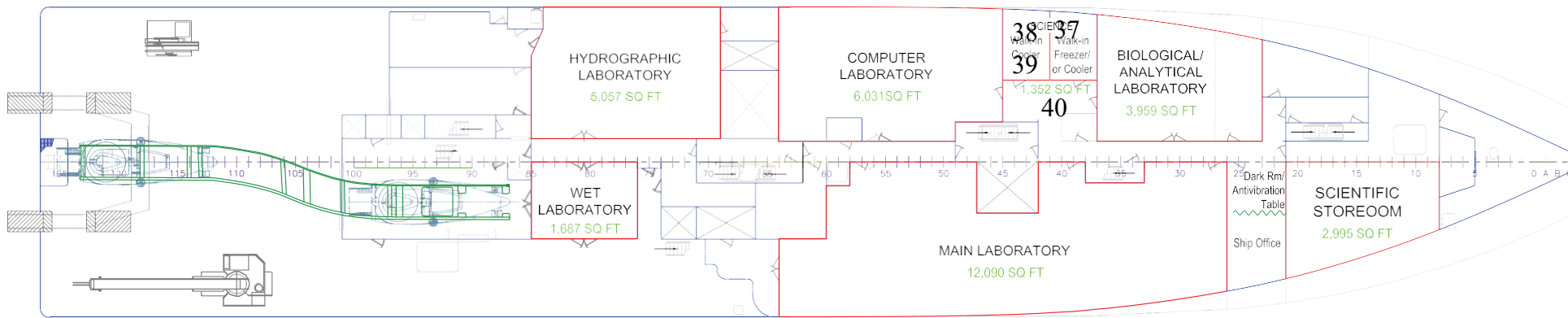


Figure 3  
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Atlantis Laboratories and Scientific Storeroom General Locations








**KEY**

 COMPUTER HUB

 SHIP EQUIP -KEEP CLEAR

 EMERGENCY ESCAPE BREATHING DEVICE

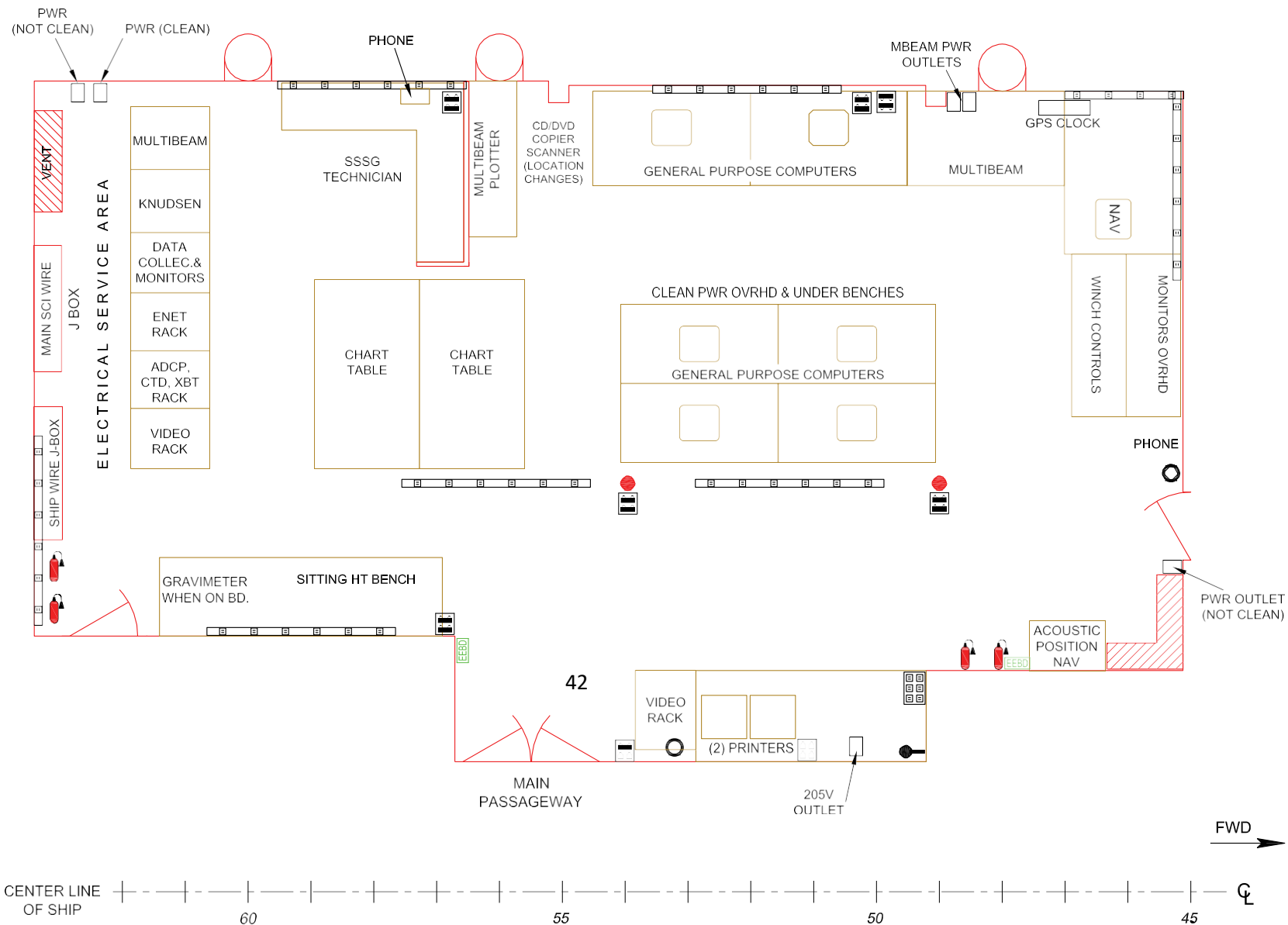
 72" POWER STRIP, 6 PLUGS

-  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

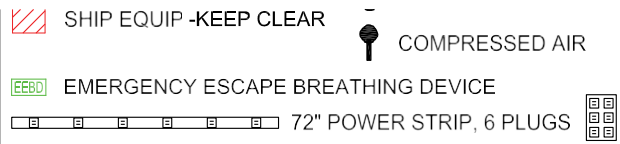
Figure 4  
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**COMPUTER LABORATORY**  
*Atlantis Main Deck, Room 1-45-2*

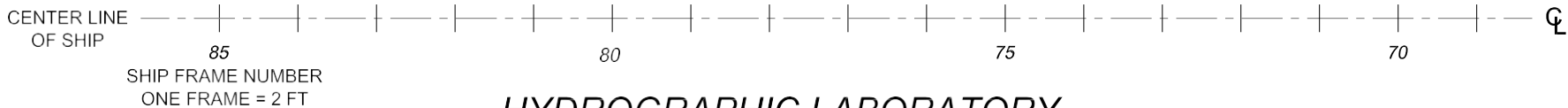
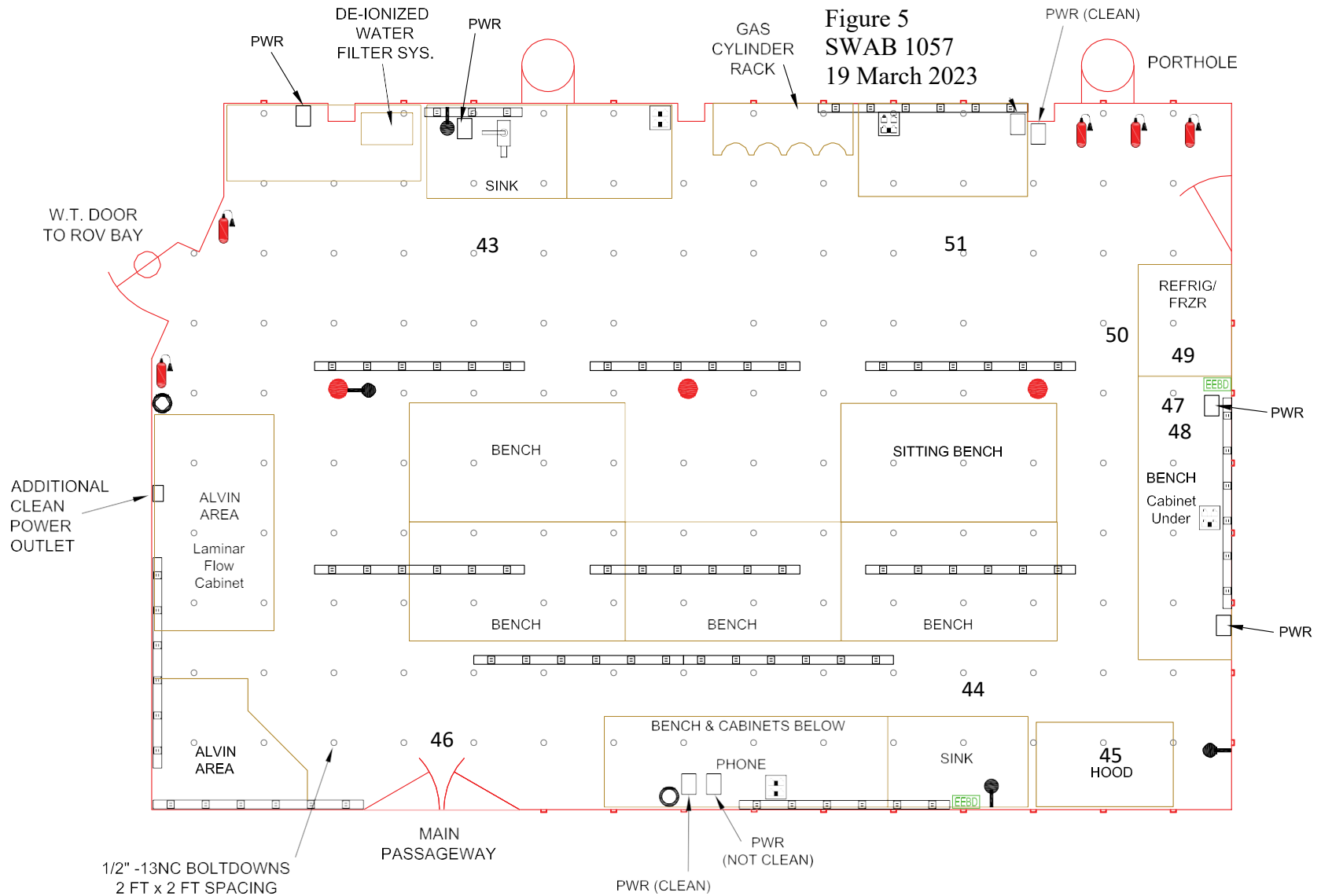
SHIP FRAME NUMBER  
ONE FRAME = 2 FT

12/30/2013






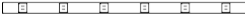




FULL LENGTH OF LAB  
ALL POWER CLEAN UNLESS NOTED

Figure 5  
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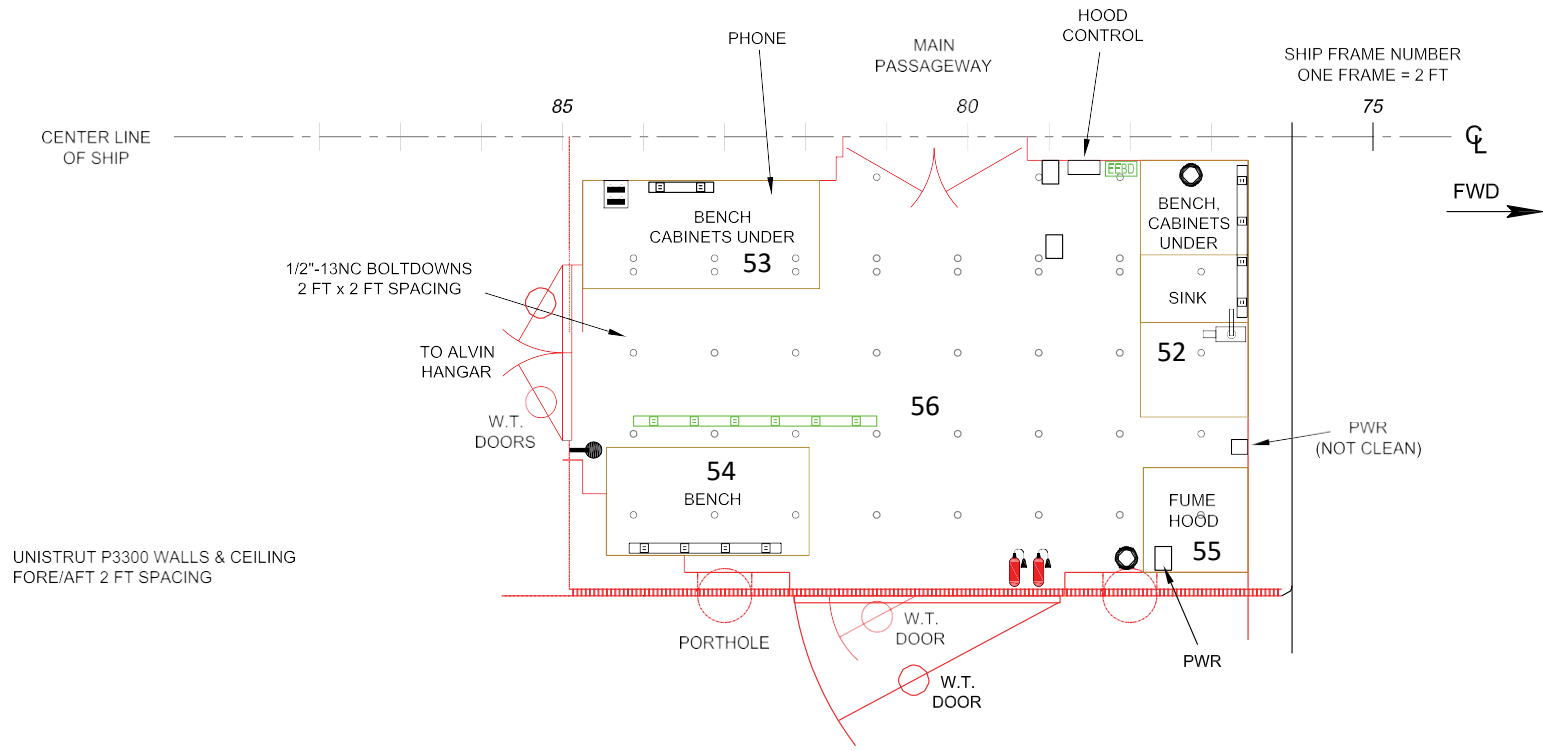
**HYDROGRAPHIC LABORATORY**  
*Atlantis Main Deck, Room 1-64-2*

**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

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

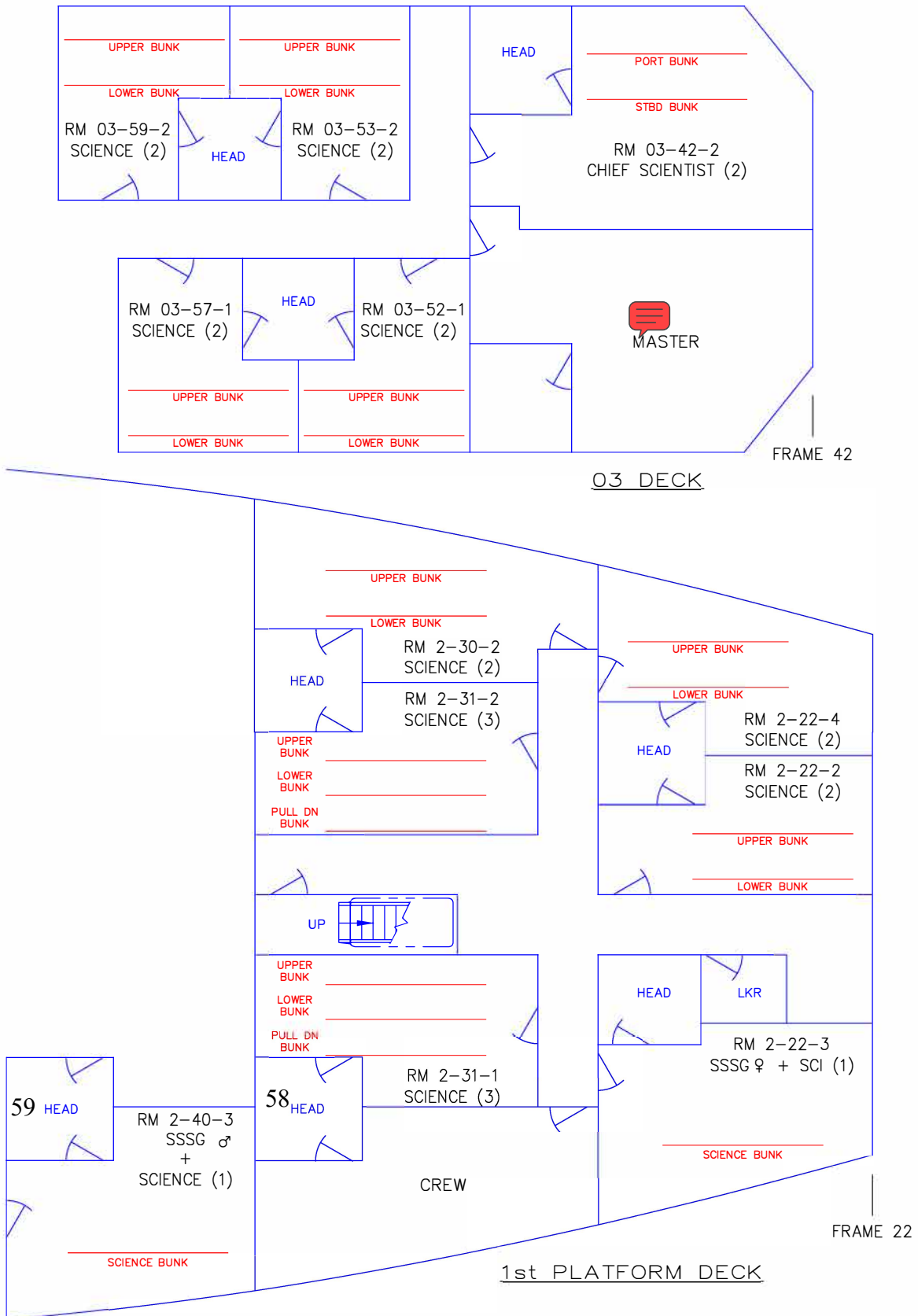
**Figure 6**  
**SWAB 1057**  
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**WET LABORATORY**  
*Atlantis Main Deck, Rm 1-76-1*

Figure 7  
 SWAB 1057  
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R/V ATLANTIS  
 SCIENCE BERTHING PLAN  
 24 Berths Available



Rad Van #2408-02

Figure 8  
SWAB #1057  
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