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Tritium Laboratory
29 October 2016

SWAB REPORT # 835

SWAB DATE: 19 October 2016

*R/V Laurence M. Gould*

James Happell

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Date: 2016.11.01 12:32:06 -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 # 835

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

DATE: 19 October 2016
TECHNICIAN: Charlene Grall

| Sample # | Sample Identification | $^{3}$H dpm/m$^{2}$ activity | ± | error | $^{14}$C dpm/m$^{2}$ activity | ± | error |
|---|---|---|---|---|---|---|---|
| 1 | 1st Vial Background | 0 | ± | 0 | 0 | ± | 0 |
| 2 | Initial bucket blank | -7 | ± | 39 | 4 | ± | 42 |
| | Dry Lab (Figure 1) | | | | | | |
| 3 | Port sink area | 11 | ± | 29 | -31 | ± | 36 |
| 4 | Forward section of bench across from port sink | -14 | ± | 50 | -11 | ± | 33 |
| 5 | Aft section of bench across from port sink | -8 | ± | 12 | -4 | ± | 68 |
| 6 | Forward section of bench across from freezer | -34 | ± | 88 | -8 | ± | 43 |
| 7 | Aft section of bench across from freezer | -29 | ± | 61 | -3 | ± | 37 |
| 8 | Inside fume hood | -19 | ± | 44 | -8 | ± | 41 |
| 9 | Deck in front of fume hood | 8 | ± | 75 | -6 | ± | 42 |
| 10 | Deck inside port entrance | -17 | ± | 28 | -13 | ± | 71 |
| 11 | Inside Kenmore -20 freezer 00010415 | -8 | ± | 75 | -14 | ± | 50 |
| 12 | Inside Fisher -20 freezer 00010622 (unit was off) | 1 | ± | 33 | -11 | ± | 62 |
| 13 | Starboard benchtop next to Consul refrigerato | 14 | ± | 52 | -2 | ± | 32 |
| 14 | Inside Consul Freezer (diluted by ice) | 252 | ± | 64 | -11 | ± | 162 |
| 15 | Inside Consul refrigerator | 22 | ± | 54 | -5 | ± | 38 |
| 16 | Deck in front of Consul refrigerator | 36 | ± | 66 | -15 | ± | 8 |
| 17 | Deck in front of Baltic door | 15 | ± | 54 | -2 | ± | 14 |
| 18 | Deck in front of port sink | 25 | ± | 74 | -12 | ± | 23 |
| | Electronics Lab (Figure 2) | | | | | | |
| 19 | Deck in front of plotter | -28 | ± | 98 | -1 | ± | 25 |
| 20 | Deck inside aft entrance | -8 | ± | 32 | -15 | ± | 48 |
| 21 | Deck inside port entrance | -61 | ± | 113 | -27 | ± | 66 |
| | Hydro Lab (Figure 3) | | | | | | |
| 22 | Aft sink area | -2 | ± | 44 | -31 | ± | 34 |
| 23 | Inside fume hood | -37 | ± | 44 | 7 | ± | 51 |
| 24 | Center sink area | 2 | ± | 60 | -17 | ± | 19 |
| 25 | Benchtop across from fume hood | -13 | ± | 64 | -5 | ± | 80 |
| 26 | Deck below fume hood and aft sink | 18 | ± | 214 | -29 | ± | 101 |
| 27 | Benchtop port of center sink | -21 | ± | 54 | -11 | ± | 55 |
| 28 | Inside Kenmore -20 freezer | 6 | | 47 | 1 | | 28 |

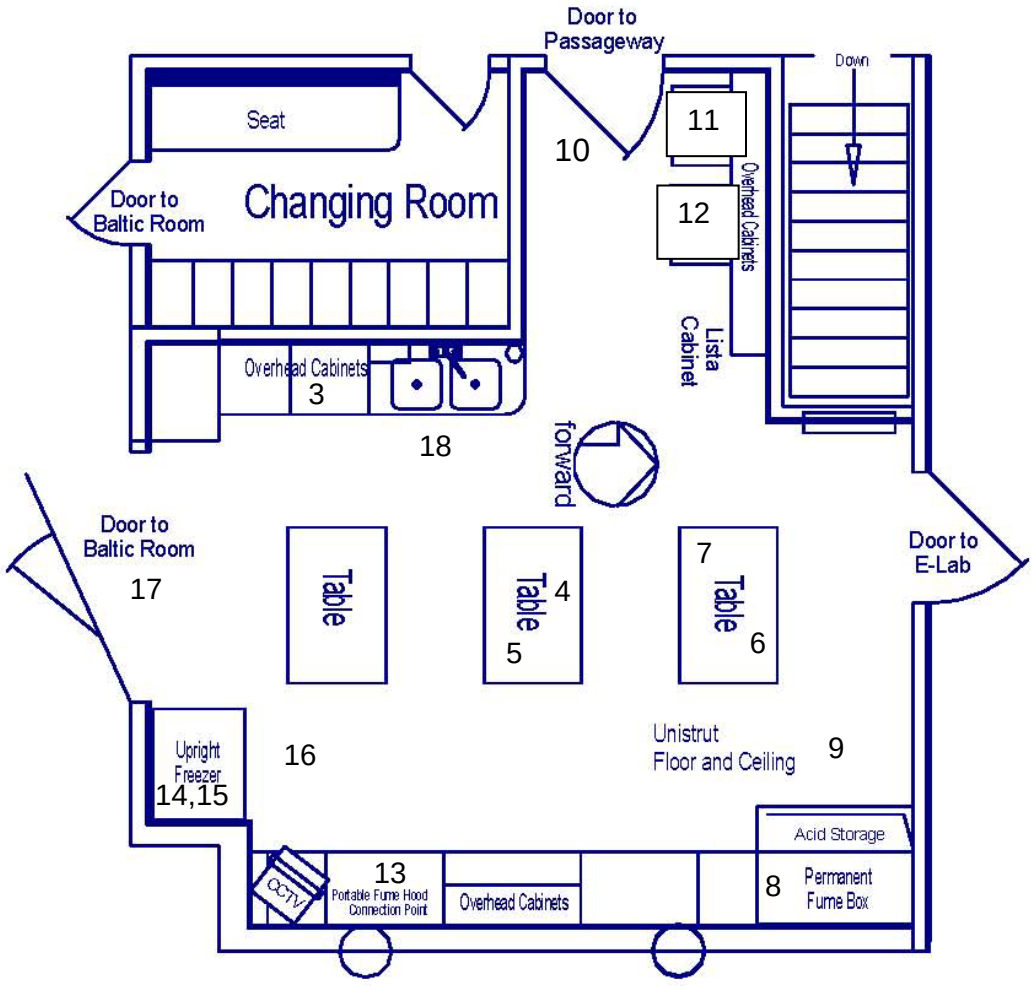
| Sample # | Sample Identification | $^{3}$H dpm/m$^{2}$ activity | | $^{3}$H dpm/m$^{2}$ error | $^{14}$C dpm/m$^{2}$ activity | | $^{14}$C dpm/m$^{2}$ error |
|---|---|---|---|---|---|---|---|
| 29 | Inside Fisher refrigerator 00010558 | -26 | | 0 | -9 | | 26 |
| 30 | Tabletop forward of Kenmore freezer | 235 | ± | 66 | 6 | ± | 12 |
| 31 | Port benchtop | 65 | ± | 74 | -40 | ± | 45 |
| 32 | Forward sink area | 0 | ± | 98 | -20 | ± | 35 |
| 33 | Starboard benchtop opposite Kenmore freezer | -24 | ± | 84 | 6 | ± | 48 |
| 34 | Deck in front of ice machine | -7 | ± | 11 | -26 | ± | 36 |
| 35 | Center section of starboard aft benchtop | 7 | ± | 22 | -28 | ± | 39 |
| 36 | Deck inside starboard entrance | 36 | | 62 | -13 | | 33 |
| | Wet Lab (Figure 4) | | | | | | |
| 37 | Center sink area | -12 | ± | 62 | -17 | ± | 64 |
| 38 | Forward fume hood and adjacent sink area | 3 | ± | 40 | -3 | ± | 28 |
| 39 | Aft sink area | -37 | ± | 79 | -20 | ± | 26 |
| 40 | Inside Fisher refrigerator 00010712 | -52 | ± | 40 | 20 | ± | 38 |
| 41 | Deck in front of aft sink | -10 | ± | 60 | -7 | ± | 19 |
| 42 | Deck between forward, starboard and Baltic doors | -1 | ± | 53 | -2 | ± | 83 |
| 43 | Benchtop across from aft sink | -2 | ± | 87 | -18 | ± | 35 |
| 44 | Deck between center benchtops | -8 | ± | 63 | 2 | ± | 19 |
| 45 | Benchtop across from fume hood | 16 | ± | 118 | -24 | ± | 41 |
| 46 | Deck in front of fume hood and forward sink | -4 | ± | 46 | -21 | ± | 41 |
| 47 | Final bucket sample (CO#3) | -12 | ± | 57 | -21 | ± | 59 |
| | Miscellaneous Areas (No Figure) | | | | | | |
| 48 | Deck of Dark Room | -132 | ± | 90 | 4 | ± | 12 |
| 49 | Deck of Enviro Room | -13 | ± | 56 | -14 | ± | 13 |
| 50 | Final bucket blank (C.O.#4) | -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. All areas tested on the ship were free from contamination that requires cleaning.

Laurence M. Gould
SWAB #835
19 October 2016
Figure 1

# Dry Lab
## 356 sq. ft.



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Laurence M. Gould
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Figure 2

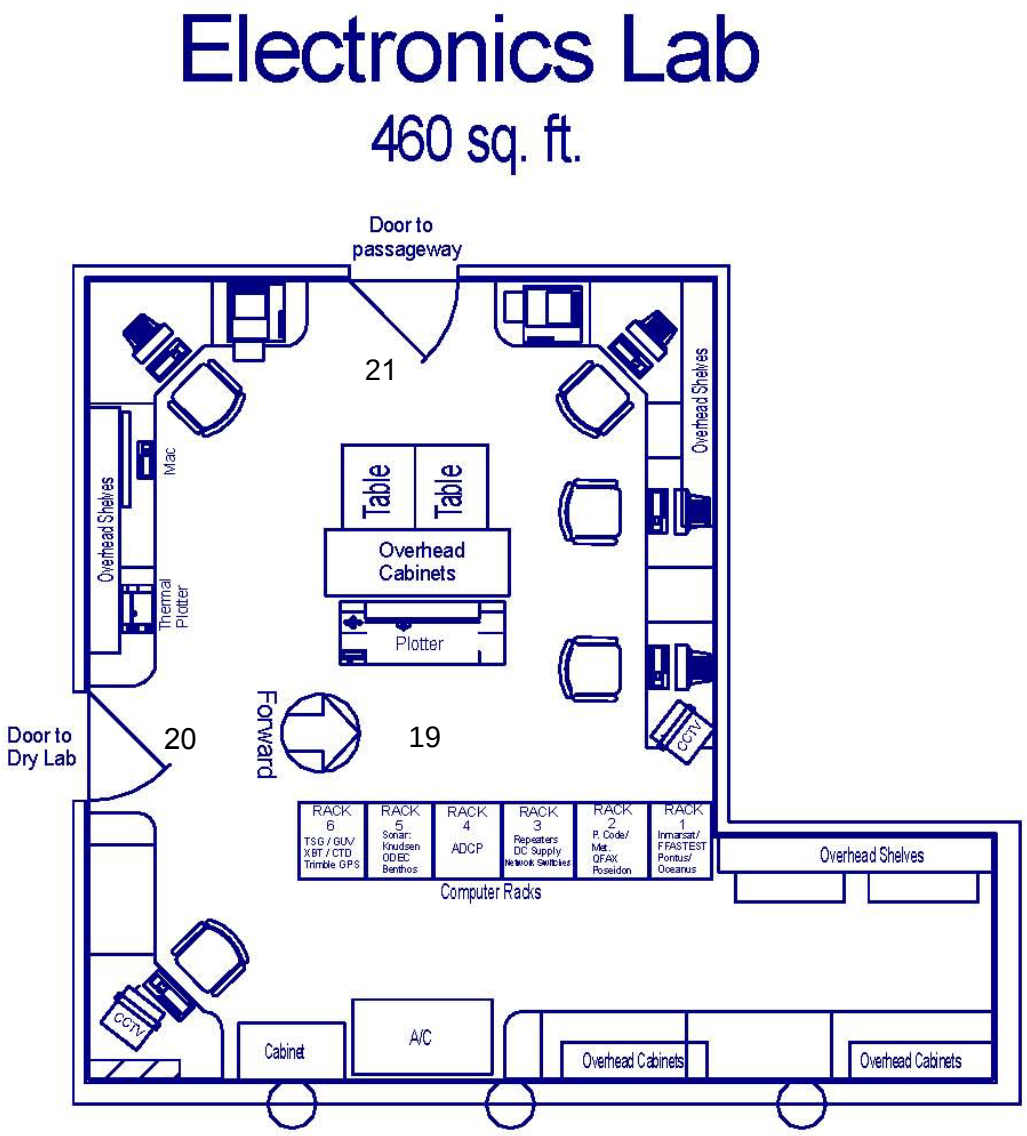

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Figure 3

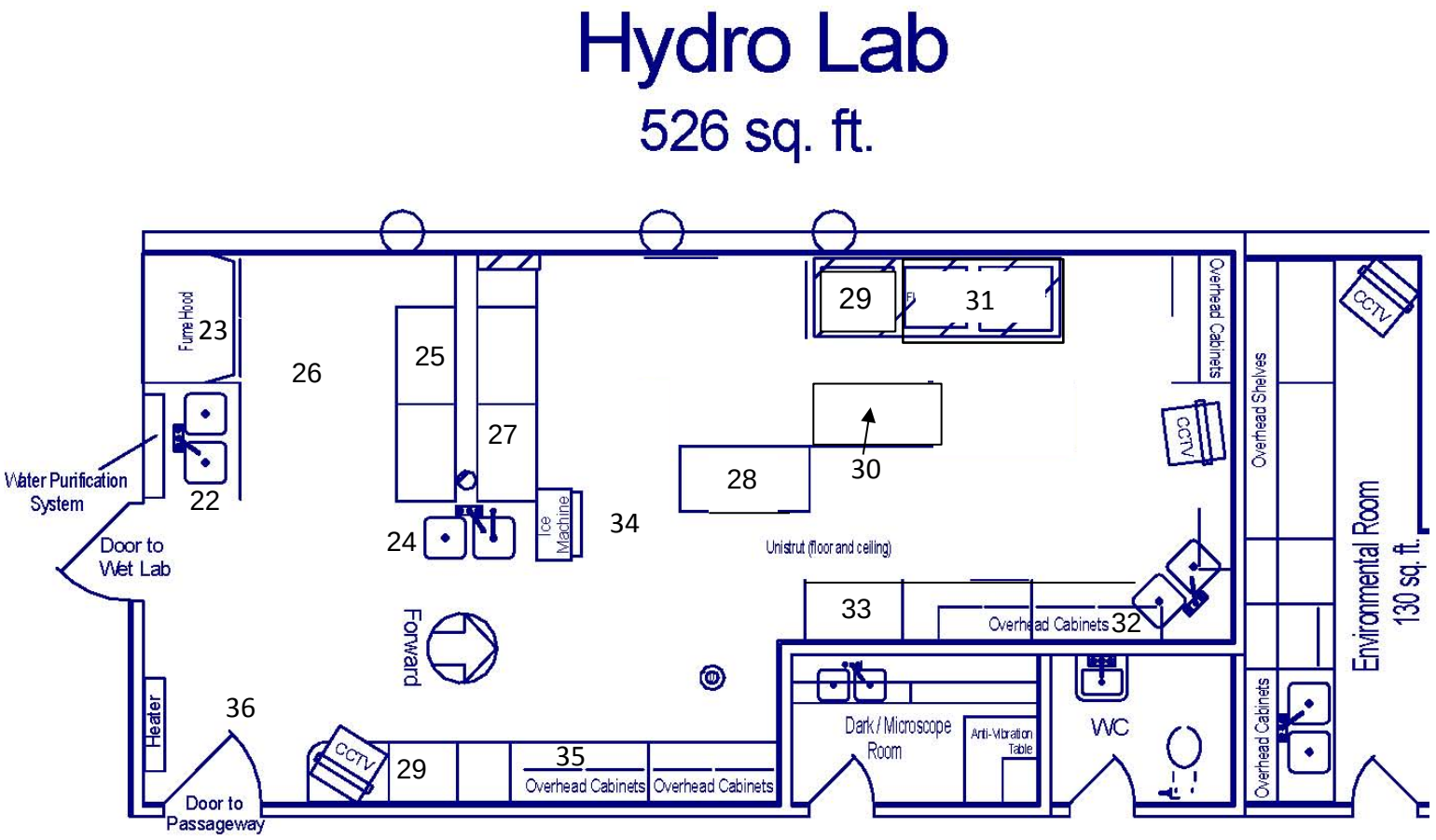

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Figure 4