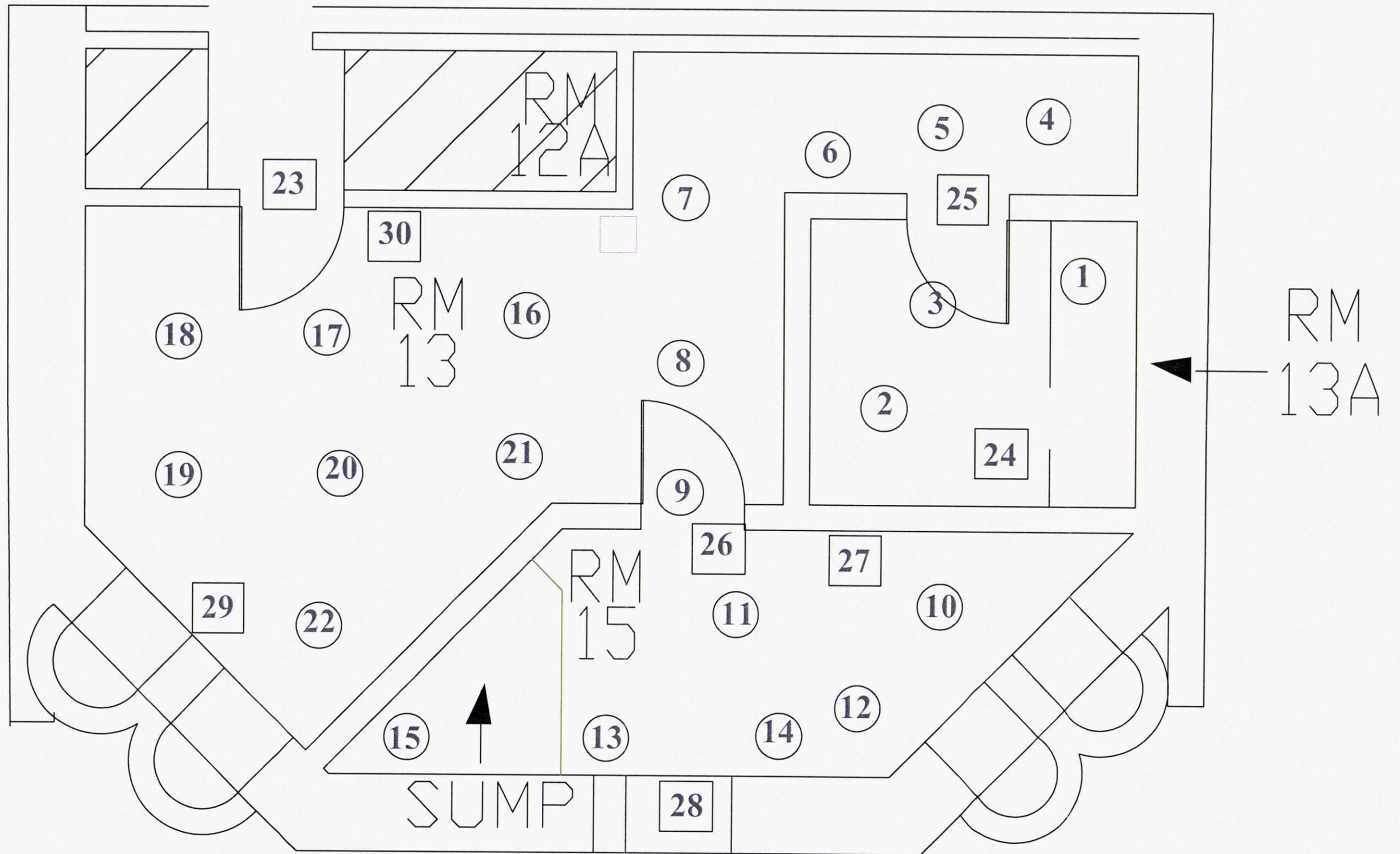


| Project: MU Pickard Hall, C0911021           |                 | Survey Unit: Basement |                                       |                     | Type of Survey: Characterization |                 |                       | Surveyor 1: Brendan Mize              |                  |                   |                            | Surveyor 2: Mike Culp            |                                 |                                       |   | Date: 6/23/2010   | Page: 1 of 1    |         |                                       |   |                   |                     |  |  |
|--|-----------------|-----------------------|---------------------------------------|---------------------|----------------------------------|-----------------|-----------------------|---------------------------------------|------------------|-------------------|----------------------------|----------------------------------|---------------------------------|---------------------------------------|---|-------------------|-----------------|---------|---------------------------------------|---|-------------------|---------------------|--|--|
| Instrument / Serial #<br>Detector / Serial # | Source Check    | Cal. Due              | Type                                  | Total/<br>Removable | Bkgd<br>(cpm)                    | Efficiency      | Surface<br>Efficiency | Total<br>Efficiency                   | Count Time (min) |                   | Area<br>(cm <sup>2</sup> ) | MDC<br>(dpm/100cm <sup>2</sup> ) | IL<br>(dpm/100cm <sup>2</sup> ) | MDC<br>% of IL                        | Comments:<br>2-pi efficiency for total surface activity measurements, 4-pi efficiency used for removable surface activity measurements. Surveys performed after encapsulation.<br><br>Reviewed: Ken Gavlik<br>Date: 6/23/2010 |                   |                 |         |                                       |   |                   |                     |  |  |
|  |                 |                       |                                       |                     |                                  |                 |                       |                                       | Sample           | Bkg.              |                            |                                  |                                 |                                       |   |                   |                 |         |                                       |   |                   |                     |  |  |
| 2241-3 / 253346<br>43-37 / 259902            | SAT             | 4/7/2011              | Beta                                  | Total               | 1382                             | 43.87%          | 0.25                  | 10.97%                                | 1                | 1                 | 582                        | 276                              | 1000                            | 28%                                   |   |                   |                 |         |                                       | Comments:<br>2-pi efficiency for total surface activity measurements, 4-pi efficiency used for removable surface activity measurements. Surveys performed after encapsulation.<br><br>Reviewed: Ken Gavlik<br>Date: 6/23/2010 |                   |                     |  |  |
| 2241-3 / 253363<br>43-37 / 2665548           | SAT             | 4/11/2011             | Alpha                                 | Total               | 16                               | 45.64%          | 0.25                  | 11.41%                                | 1                | 1                 | 582                        | 33                               | 100                             | 33%                                   |   |                   |                 |         |                                       |   |                   |                     |  |  |
| 2929 / 160013<br>43-10-1 / 167231            | SAT             | 8/18/2010             | Beta                                  | Removable           | 55                               | 23.47%          | N/A                   | 23.47%                                | 2                | 10                | 100                        | 87                               | 200                             | 43%                                   |   |                   |                 |         |                                       |   |                   |                     |  |  |
| 2929 / 160013<br>43-10-1 / 167231            | SAT             | 8/18/2010             | Alpha                                 | Removable           | 0.4                              | 35.25%          | N/A                   | 35.25%                                | 2                | 10                | 100                        | 9                                | 20                              | 44%                                   |   |                   |                 |         |                                       |   |                   |                     |  |  |
| Total Surface Activity                       |                 |                       |                                       |                     |                                  |                 |                       |                                       |                  |                   |                            | Removable Surface Activity       |                                 |                                       |   |                   |                 |         |                                       |   |                   |                     |  |  |
| Location - Room                              | Beta            |                       |                                       |                     |                                  | Alpha           |                       |                                       |                  |                   | Sum of<br>Fractions        | Beta                             |                                 |                                       |   |                   | Alpha           |         |                                       |   |                   | Sum of<br>Fractions |  |  |
|  | Gross<br>Counts | Net cpm               | Activity<br>(dpm/100cm <sup>2</sup> ) | Notes               | Fraction of<br>IL                | Gross<br>Counts | Net cpm               | Activity<br>(dpm/100cm <sup>2</sup> ) | Notes            | Fraction of<br>IL |                            | Gross<br>Counts                  | Net cpm                         | Activity<br>(dpm/100cm <sup>2</sup> ) | Notes   | Fraction of<br>IL | Gross<br>Counts | Net cpm | Activity<br>(dpm/100cm <sup>2</sup> ) | Notes   | Fraction of<br>IL |                     |  |  |
| 1 - 13A Closet                               | 6,126           | 4,744                 | 7,432                                 |                     | 7.43                             | 76              | 60                    | 90                                    |                  | 0.90              | N/A                        | 116                              | 3                               | 13                                    | <MDC  | 0.06              | 9               | 4.1     | 12                                    |   | 0.58              | N/A                 |  |  |
| 2 - 13A                                      | 2,676           | 1,294                 | 2,027                                 |                     | 2.03                             | 16              | 0                     | 0                                     | <MDC             | 0.00              | N/A                        | 122                              | 6                               | 26                                    | <MDC  | 0.13              | 3               | 1.1     | 3                                     | <MDC  | 0.16              | N/A                 |  |  |
| 3 - 13A                                      | 2,597           | 1,215                 | 1,903                                 |                     | 1.90                             | 19              | 3                     | 5                                     | <MDC             | 0.05              | N/A                        | 107                              | -1.5                            | -6                                    | <MDC  | 0.00              | 2               | 0.6     | 2                                     | <MDC  | 0.09              | N/A                 |  |  |
| 4 - 13                                       | 2,588           | 1,206                 | 1,889                                 |                     | 1.89                             | 19              | 3                     | 5                                     | <MDC             | 0.05              | N/A                        | 113                              | 1.5                             | 6                                     | <MDC  | 0.03              | 6               | 2.6     | 7                                     | <MDC  | 0.37              | N/A                 |  |  |
| 5 - 13                                       | 2,234           | 852                   | 1,335                                 |                     | 1.33                             | 42              | 26                    | 39                                    |                  | 0.39              | N/A                        | 114                              | 2                               | 9                                     | <MDC  | 0.04              | 2               | 0.6     | 2                                     | <MDC  | 0.09              | N/A                 |  |  |
| 6 - 13                                       | 9,605           | 8,223                 | 12,882                                |                     | 12.88                            | 62              | 46                    | 69                                    |                  | 0.69              | N/A                        | 105                              | -2.5                            | -11                                   | <MDC  | 0.00              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 7 - 13                                       | 10,231          | 8,849                 | 13,863                                |                     | 13.86                            | 138             | 122                   | 184                                   |                  | 1.84              | N/A                        | 115                              | 2.5                             | 11                                    | <MDC  | 0.05              | 3               | 1.1     | 3                                     | <MDC  | 0.16              | N/A                 |  |  |
| 8 - 13                                       | 59,839          | 58,457                | 91,581                                |                     | 91.58                            | 60              | 44                    | 66                                    |                  | 0.66              | N/A                        | 112                              | 1                               | 4                                     | <MDC  | 0.02              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 9-13   | 4,680           | 3,298                 | 5,167                                 |                     | 5.17                             | 31              | 15                    | 23                                    | <MDC             | 0.23              | N/A                        | 118                              | 4                               | 17                                    | <MDC  | 0.09              | 7               | 3.1     | 9                                     | <MDC  | 0.44              | N/A                 |  |  |
| 10-15  | 7,632           | 6,250                 | 9,792                                 |                     | 9.79                             | 55              | 39                    | 59                                    |                  | 0.59              | N/A                        | 102                              | -4                              | -17                                   | <MDC  | 0.00              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 11-15  | 2,949           | 1,567                 | 2,455                                 |                     | 2.45                             | 56              | 40                    | 60                                    |                  | 0.60              | N/A                        | 120                              | 5                               | 21                                    | <MDC  | 0.11              | 6               | 2.6     | 7                                     | <MDC  | 0.37              | N/A                 |  |  |
| 12-15  | 9,331           | 7,949                 | 12,453                                |                     | 12.45                            | 119             | 103                   | 155                                   |                  | 1.55              | N/A                        | 110                              | 0                               | 0                                     | <MDC  | 0.00              | 5               | 2.1     | 6                                     | <MDC  | 0.30              | N/A                 |  |  |
| 13-15  | 4,074           | 2,692                 | 4,217                                 |                     | 4.22                             | 46              | 30                    | 45                                    |                  | 0.45              | N/A                        | 116                              | 3                               | 13                                    | <MDC  | 0.06              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 14-15  | 3,382           | 2,000                 | 3,133                                 |                     | 3.13                             | 100             | 84                    | 126                                   |                  | 1.26              | N/A                        | 124                              | 7                               | 30                                    | <MDC  | 0.15              | 2               | 0.6     | 2                                     | <MDC  | 0.09              | N/A                 |  |  |
| 15-15  | 39,443          | 38,061                | 59,628                                |                     | 59.63                            | 89              | 73                    | 110                                   |                  | 1.10              | N/A                        | 101                              | -4.5                            | -19                                   | <MDC  | 0.00              | 6               | 2.6     | 7                                     | <MDC  | 0.37              | N/A                 |  |  |
| 16-13  | 12,271          | 10,889                | 17,059                                |                     | 17.06                            | 77              | 61                    | 92                                    |                  | 0.92              | N/A                        | 126                              | 8                               | 34                                    | <MDC  | 0.17              | 1               | 0.1     | 0                                     | <MDC  | 0.01              | N/A                 |  |  |
| 17-13  | 19,940          | 18,558                | 29,074                                |                     | 29.07                            | 106             | 90                    | 136                                   |                  | 1.36              | N/A                        | 121                              | 5.5                             | 23                                    | <MDC  | 0.12              | 5               | 2.1     | 6                                     | <MDC  | 0.30              | N/A                 |  |  |
| 18-13  | 80,610          | 79,228                | 124,122                               |                     | 124.12                           | 281             | 265                   | 399                                   |                  | 3.99              | N/A                        | 116                              | 3                               | 13                                    | <MDC  | 0.06              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 19-13  | 35,229          | 33,847                | 53,026                                |                     | 53.03                            | 392             | 376                   | 566                                   |                  | 5.66              | N/A                        | 114                              | 2                               | 9                                     | <MDC  | 0.04              | 0               | -0.4    | -1                                    | <MDC  | 0.00              | N/A                 |  |  |
| 20-13  | 93,649          | 92,267                | 144,549                               |                     | 144.55                           | 82              | 66                    | 99                                    |                  | 0.99              | N/A                        | 112                              | 1                               | 4                                     | <MDC  | 0.02              | 5               | 2.1     | 6                                     | <MDC  | 0.30              | N/A                 |  |  |
| 21-13  | 33,339          | 31,957                | 50,065                                |                     | 50.07                            | 147             | 131                   | 197                                   |                  | 1.97              | N/A                        | 136                              | 13                              | 55                                    | <MDC  | 0.28              | 6               | 2.6     | 7                                     | <MDC  | 0.37              | N/A                 |  |  |
| 22-13  | 81,549          | 80,167                | 125,593                               |                     | 125.59                           | 447             | 431                   | 649                                   |                  | 6.49              | N/A                        | 129                              | 9.5                             | 40                                    | <MDC  | 0.20              | 8               | 3.6     | 10                                    | <MDC  | 0.51              | N/A                 |  |  |
| 23-13 Door                                   | 3,240           | 1,858                 | 2,911                                 |                     | 2.91                             | 34              | 18                    | 27                                    | <MDC             | 0.27              | N/A                        | 120                              | 5                               | 21                                    | <MDC  | 0.11              | 1               | 0.1     | 0                                     | <MDC  | 0.01              | N/A                 |  |  |
| 24-13A Door Frame                            | 8,004           | 6,622                 | 10,374                                |                     | 10.37                            | 124             | 108                   | 163                                   |                  | 1.63              | N/A                        | 110                              | 0                               | 0                                     | <MDC  | 0.00              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 25-13A Door                                  | 1,390           | 8                     | 13                                    | <MDC                | 0.01                             | 27              | 11                    | 17                                    | <MDC             | 0.17              | N/A                        | 128                              | 9                               | 38                                    | <MDC  | 0.19              | 5               | 2.1     | 6                                     | <MDC  | 0.30              | N/A                 |  |  |
| 26-15 Door                                   | 1,880           | 498                   | 780                                   |                     | 0.78                             | 27              | 11                    | 17                                    | <MDC             | 0.17              | N/A                        | 111                              | 0.5                             | 2                                     | <MDC  | 0.01              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 27-15 Wall                                   | 4,275           | 2,893                 | 4,532                                 |                     | 4.53                             | 29              | 13                    | 20                                    | <MDC             | 0.20              | N/A                        | 118                              | 4                               | 17                                    | <MDC  | 0.09              | 1               | 0.1     | 0                                     | <MDC  | 0.01              | N/A                 |  |  |
| 28-15 Door                                   | 2,243           | 861                   | 1,349                                 |                     | 1.35                             | 50              | 34                    | 51                                    |                  | 0.51              | N/A                        | 114                              | 2                               | 9                                     | <MDC  | 0.04              | 4               | 1.6     | 5                                     | <MDC  | 0.23              | N/A                 |  |  |
| 29-13 Electrical Panel                       | 1,930           | 548                   | 859                                   |                     | 0.86                             | 47              | 31                    | 47                                    |                  | 0.47              | N/A                        | 121                              | 5.5                             | 23                                    | <MDC  | 0.12              | 1               | 0.1     | 0                                     | <MDC  | 0.01              | N/A                 |  |  |
| 30-13 Wall                                   | 1,793           | 411                   | 644                                   |                     | 0.64                             | 31              | 15                    | 23                                    | <MDC             | 0.23              | N/A                        | 120                              | 5                               | 21                                    | <MDC  | 0.11              | 2               | 0.6     | 2                                     | <MDC  | 0.09              | N/A                 |  |  |

Pickard Hall Basement Post - Encapsulation Dose Rate Measurements

| Location | Distance | NaI Static (cpm) | Bicron Instantaneous Measurements ( $\mu$ Rem/hr) |    |    |    |    |    |    |    |    |    | STDEV | Max | Mean | Corrected Mean | Annual Occupancy (hrs) |             |
|----------|----------|------------------|---|----|----|----|----|----|----|----|----|----|-------|-----|------|----------------|------------------------|-------------|
|          |          |                  | 1   | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |       |     |      |                | 25 mrem/yr             | 100 mrem/yr |
| 1        | 1 m      | 4,271            | 10  | 10 | 9  | 10 | 9  | 9  | 8  | 8  | 9  | 10 | 0.8   | 10  | 9.2  | 2.5            | >2500                  | >2500       |
| 2        | 1 m      | 6,337            | 12  | 13 | 13 | 13 | 12 | 13 | 12 | 13 | 14 | 14 | 0.7   | 14  | 12.9 | 6.2            | >2500                  | >2500       |
| 3        | 1 m      | 5,881            | 15  | 14 | 14 | 14 | 13 | 13 | 14 | 12 | 12 | 13 | 1.0   | 15  | 13.4 | 6.7            | >2500                  | >2500       |
| 4        | 1 m      | 8,062            | 11  | 10 | 11 | 10 | 9  | 10 | 11 | 10 | 11 | 10 | 0.7   | 11  | 10.3 | 3.6            | >2500                  | >2500       |
| 5        | 1 m      | 9,992            | 10  | 11 | 11 | 10 | 10 | 9  | 9  | 9  | 10 | 11 | 0.8   | 11  | 10   | 3.3            | >2500                  | >2500       |
| 6        | 1 m      | 3,758            | 13  | 14 | 15 | 15 | 15 | 13 | 14 | 10 | 15 | 15 | 1.6   | 15  | 13.9 | 7.2            | >2500                  | >2500       |
| 7        | 1 m      | 8,002            | 15  | 16 | 16 | 17 | 17 | 16 | 16 | 15 | 16 | 17 | 0.7   | 17  | 16.1 | 9.4            | >2500                  | >2500       |
| 8        | 1 m      | 9,043            | 13  | 14 | 15 | 13 | 13 | 14 | 13 | 13 | 13 | 14 | 0.7   | 15  | 13.5 | 6.8            | >2500                  | >2500       |
| 9        | 1 m      | 9,885            | 16  | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 16 | 0.7   | 17  | 15.7 | 9              | >2500                  | >2500       |
| 10       | 1 m      | 4,826            | 14  | 13 | 13 | 12 | 12 | 13 | 12 | 11 | 12 | 11 | 0.9   | 14  | 12.3 | 5.6            | >2500                  | >2500       |
| 11       | 1 m      | 1,435            | 12  | 11 | 12 | 11 | 12 | 11 | 13 | 12 | 11 | 11 | 0.7   | 13  | 11.6 | 4.9            | >2500                  | >2500       |
| 12       | 1 m      | 13,156           | 11  | 12 | 11 | 12 | 13 | 11 | 13 | 12 | 13 | 14 | 1.0   | 14  | 12.2 | 5.5            | >2500                  | >2500       |
| 13       | 1 m      | 22,281           | 14  | 14 | 15 | 15 | 16 | 14 | 17 | 17 | 18 | 17 | 1.5   | 18  | 15.7 | 9              | >2500                  | >2500       |
| 14       | 1 m      | 19,604           | 20  | 20 | 22 | 20 | 22 | 22 | 20 | 21 | 22 | 22 | 1.0   | 22  | 21.1 | 14.4           | 1,736                  | >2500       |
| 15       | 1 m      | 15,042           | 10  | 11 | 12 | 11 | 11 | 10 | 10 | 11 | 11 | 12 | 0.7   | 12  | 10.9 | 4.2            | >2500                  | >2500       |
| 16       | 1 m      | 18,883           | 17  | 17 | 16 | 17 | 17 | 18 | 17 | 18 | 18 | 18 | 0.7   | 18  | 17.3 | 10.6           | 2,358                  | >2500       |
| 17       | 1 m      | 19,621           | 18  | 18 | 19 | 19 | 18 | 18 | 17 | 18 | 19 | 20 | 0.8   | 20  | 18.4 | 11.7           | 2,137                  | >2500       |
| 18       | 1 m      | 18,793           | 22  | 22 | 20 | 20 | 22 | 22 | 20 | 18 | 18 | 20 | 1.6   | 22  | 20.4 | 13.7           | 1,825                  | >2500       |
| 19       | 1 m      | 19,275           | 12  | 13 | 14 | 13 | 14 | 14 | 15 | 14 | 15 | 16 | 1.2   | 16  | 14   | 7.3            | >2500                  | >2500       |
| 20       | 1 m      | 20,115           | 19  | 19 | 20 | 20 | 18 | 18 | 18 | 17 | 18 | 19 | 1.0   | 20  | 18.6 | 11.9           | 2,101                  | >2500       |
| 21       | 1 m      | 18,802           | 17  | 18 | 17 | 16 | 16 | 17 | 16 | 17 | 16 | 17 | 0.7   | 18  | 16.7 | 10             | 2,500                  | >2500       |
| 22       | 1 m      | 20,474           | 17  | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 16 | 16 | 0.5   | 17  | 16   | 9.3            | >2500                  | >2500       |
| 23       | 1 m      | 20,507           | 17  | 18 | 17 | 17 | 16 | 17 | 18 | 17 | 17 | 16 | 0.7   | 18  | 17   | 10.3           | 2,427                  | >2500       |
| 24       | 1 m      | 4,189            | 17  | 17 | 16 | 17 | 16 | 17 | 16 | 15 | 15 | 15 | 0.9   | 17  | 16.1 | 9.4            | >2500                  | >2500       |
| 25       | 1 m      | 1,999            | 13  | 13 | 13 | 12 | 11 | 12 | 13 | 11 | 11 | 11 | 0.9   | 13  | 12   | 5.3            | >2500                  | >2500       |
| 26       | 1 m      | 19,280           | 12  | 13 | 13 | 14 | 14 | 13 | 14 | 13 | 14 | 14 | 0.7   | 14  | 13.4 | 6.7            | >2500                  | >2500       |
| 27       | 1 m      | 21,245           | 16  | 15 | 16 | 16 | 17 | 16 | 15 | 16 | 16 | 15 | 0.6   | 17  | 15.8 | 9.1            | >2500                  | >2500       |
| 28       | 1 m      | 20,344           | 18  | 19 | 19 | 19 | 20 | 20 | 19 | 20 | 20 | 20 | 0.7   | 20  | 19.4 | 12.7           | 1,969                  | >2500       |
| 29       | 1 m      | 20,836           | 18  | 19 | 18 | 19 | 19 | 18 | 19 | 19 | 19 | 20 | 0.6   | 20  | 18.8 | 12.1           | 2,066                  | >2500       |
| 30       | 1 m      | 19,714           | 18  | 18 | 18 | 18 | 19 | 19 | 19 | 18 | 19 | 19 | 0.5   | 19  | 18.5 | 11.8           | 2,119                  | >2500       |



- # - Floor Sample Location Number
- # - Wall Sample Location Number