Bristol-Myers Squibb Company

P.O. Box 191 New Brunswick, NJ 08903-0191 732-227-5000

November 9, 2005

Docket No. 03-005222
Control No. 137626

MS16

Q-5

Ms. Betsy Ullrich
US NRC Region I
475 Allendale Road
King of Prussia, PA 19406

RE: REQUEST FOR ADDITIONAL INFORMATION CONCERNING AMENDMENT FOR RADIOACTIVE MATERIAL LICENSE #29-00139-02

0300 05222

Dear Ms. Ullrich:

In response to your request dated October 14, 2005 for additional information to complete our amendment request, E. R. Squibb & Sons LLC, a division of Bristol-Myers Squibb Company (BMS), is providing the following your review:

Item # 1

BMS occupies 18,500 ft^2 at Three Hamilton Health Place. Of that area, approximately 2,200 ft^2 was utilized for licensed activities. The facility is located adjacent to Robert Wood University Hospital – Hamilton in a residential area.

Item #2

Because of the high DCGL$_W$ values for the radionuclides of concern (see table below), and the objective of the survey, the release limits were adopted from Regulatory Guide 1.86 which are much more restrictive than the DCGL$_W$ values.

DCGL$_w$ Values

Radionuclide	Total Contamination (dpm/100cm^2)	Removable Contamination[1] (dpm/100cm^2)
H-3	124,000,000[#]	12,400,000
C-14	3,670,000[#]	367,000
I-125	690,000	69,000

Notes:

[1]Removable criteria = Total/10

[#] From Table 5.19, NUREG/CR-5512 Vol. 3, P$_{crit}$ = 0.10

137626

NUCLEAR MATERIALS

Item #3

Based on the information in MARSSIM Chapter 6, section 6.7, the scanning minimum detectable concentration for these systems was determined based on the following equation:

$$Scan\ MDC = MDCR / [p^{1/2} * e_i * e_s * (probe\ area\ /\ 100\ cm^2)$$

where

$MDCR$ = minimum detectable count rate
e_i = instrument efficiency
e_s = surface efficiency (typically = 0.5)
p = surveyor efficiency (typically = 0.5)

Assuming a background count rate of 300 cpm, the MDCR for the model 43-68 probes ($100\ cm^2$) for this project were 185 cpm. This is based on a scan rate of 1 probe width per second, with a requirement of 95% correct detections and an acceptable rate of false positives equal to 60%. Using the same parameters and a background count rate of 800 cpm, the MDCR for the model 239-IF floor monitor ($600\ cm^2$) is 302 cpm. The Scan MDCs are then as presented in Table 1, assuming typical values of 0.5 for both surveyor efficiency and surface efficiency, and efficiency for carbon-14 of 0.13.

Instrument Scan MDCs

Instrument	MDCR (cpm)	Scan MDC (dpm/100 cm^2)
Ludlum Model 12 w/ Model 43-68 probe	185	4,025
Ludlum Model 12 w/ Model 43-37-1 probe Floor Monitor	302	1,129

For scaler readings, the minimum detectable activity for each meter-probe combination is dependent on several factors. These include count time, efficiency for each specific isotope, and the radiological content of each different material surveyed (i.e., ceramic tiles will have a higher background than dry wall). The table below shows typical MDAs for these survey systems for carbon-14. The actual MDAs will be determined at the time of the surveys. These are determined using the following formula:

$$MDA = \frac{2.71 + 4.65\sqrt{Br \times t}}{t \times E \times A/100}$$

where:

MDA = activity in dpm/100 cm^2
Br = background rate in counts per minute
t = counting time in minutes
E = detector efficiency in counts per disintegration (4π)
A = probe area or area wiped in cm^2

Instrument Scaler MDAs

Instrument	Minimum Detectable Activity
Ludlum Model 12 w/Model 43-68 probe	500 - 550 dpm/100 cm^2
Ludlum Model 12 w/Model 43-37-1 probe Floor Monitor	175 – 225 dpm/100 cm^2

Item #4

While MARSSIM was used as a guide in performing these surveys, the surveys were not meant to conform to MARSSIM as the release criteria used were not determined using MARSSIM because it was felt that these criteria would be too high. MARSSIM was used as a reference for equations and MARSSIM definitions (such as "Class 2 survey") were used as it is a universally accepted document. Here, Class 2 is meant only as a means of identifying the potential contamination level for the rooms surveyed.

Item #5

See response to Item #3 above.

Item #6

The MDAs presented in the referenced section of the report represent total activity in each channel. Counting time was determined to achieve an MDA low enough to meet the 20 dpm release criterion for I-125 that is given in Regulatory Guide 1.86. Any activity over these amounts was considered a contaminated area which required decontamination.

Item #7

No statistical analysis was done because the release criteria used came from Reg. Guide 1.86, not MARSSIM.

If you require additional information, please contact me at michael.vala@bms.com or (732) 227-5096. Thank you for your assistance.

Sincerely,

Michael J Vala

Michael J. Vala, CHP
Radiation Safety Officer/Manager, EHS