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THE USE OF MULTI-ELEMENT BETA DOSIMETERS FOR MEASURING DOSE RATES IN THE TMI-2 CONTAINMENT BUILDING

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SUMMARY

The use of thermoluminescent dosimeters (TLDs) for beta dosimetry has traditionally involved inaccuracies due to the energy-dependent response of the TLDs. In order to correct for the beta energy spectrum, researchers at the Pacific Northwest Laboratory (PNL--operated by Battelle Memorial Institute) have developed a dosimeter using TLDs under a number of different thicknesses of aluminum shields. These shields provide attenuation to the beta field that depends on the thickness of the shield and the energy of the beta particles striking the dosimeter. This type of dosimeter is able to automatically correct for the energy distribution of the beta radiation field, thus overcoming the energy-dependent inaccuracies of previous TLD-based dosimeters.

The PNL multi-element beta dosimeter has been used in four-element and seven-element configurations. The seven-element configurations were developed to provide better discrimination to low-energy betas. The dosimeters are assembled and analyzed in the PNL TLD Laboratory. Design considerations, analysis procedures, quality assurance, and error determinations for the dosimeters are described in this report. The methods of data analysis used for converting TLD response to dose are also described.

These multi-element dosimeters have been used to measure beta and gamma doses resulting from radioactive contaminants in the Three Mile Island Unit 2 containment building. Over 100 dosimeters have been used in three sets of experiments at a number of locations in the building. This report documents the experiments and presents the doses evaluated by the dosimeters.

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INTRODUCTION

There is a considerable amount of radioactive material contaminating many interior surfaces of the containment building of the Three Mile Island Unit 2 reactor as a result of the accident in March 1979. As work has begun on performing decontamination and other tasks in the building, it is important to have an accurate description of the contamination on these surfaces. This report describes dosimeters that were developed to measure dose rates due to the surface contamination found in TMI-2 containment. These dosimeters are capable of measuring doses due to beta and gamma radiation emitted by radionuclides deposited on the contaminated surfaces and suspended in the air near these surfaces. This report discusses the design of the dosimeter, and the calibration procedures and methods of using them for dose determinations. The report also describes the use of the dosimeters in TMI-2 containment and presents the results of this application.

A dosimeter may be placed near a contaminated surface for two basic purposes: (1) to give an indication of the quantity of radioactive material on the surface and (2) to give an estimate of the radiological hazard to a person positioned near the surface. For evaluating the presence of radioactive material, the quantity "dose," measured in units of rad, is most useful. In this study, dose is measured by dosimeters made of ${}^7\text{LiF}$, which has energy absorption characteristics for beta and gamma radiation that are very similar to that of tissue, so the dosimeters give a good indication of dose to tissue. For evaluating the radiological hazard to personnel, the "dose equivalent," measured in units of rem, is most useful. (The dose equivalent for beta dosimetry is usually measured at a depth of 7 mg/cm^2 in tissue.) Since this discussion is concerned only with beta and gamma radiation, the quantities "dose to tissue" and "dose equivalent" are nearly numerically equal. Therefore this discussion will always refer to the dose (meaning "dose to tissue") measured by the dosimeter.

Another radiological quantity, "exposure," is commonly confused with dose and dose equivalent. This quantity is strictly valid only for photons in air, and in this report it is only used when discussing calibration procedures

using photons. Exposure is measured in units of roentgens (R). There will be instances in this report where the term "expose" is used, however. This term will be used, for example, when a dosimeter is placed in a radiation field and is therefore exposed to radiation. In this situation the dosimeter will still be used to evaluate the dose.

The dosimeter described in this report is a passive device, designed to be exposed to a field of radiation for a well-defined period of time. As the dosimeter is struck by radiation, material damage occurs in the dosimeter. After the dosimeter is taken from the radiation field, it is processed to determine the amount of material damage, and thus evaluate the dose received by the dosimeter. When this dose is divided by the amount of time in the radiation field, the result is an average dose rate. For this type of passive dosimetry, the health physics community has found thermoluminescent dosimeters (TLDs) to be very useful. The material has been shown to be rugged and reliable, with well-defined characteristics for dose determinations. The dose response of TLDs to radiation is linear over a wide range of doses for gammas and betas of any energy likely to be encountered in TMI-2 containment.

The use of TLDs for beta dosimetry has traditionally involved inaccuracies for beta dosimetry, however, due to the energy-dependent response of the TLDs to betas. In order to correct for differing beta energy spectra, researchers at the Pacific Northwest Laboratory (PNL) have developed a dosimeter using TLDs under shields of various thicknesses. These shields were chosen to provide differing amounts of attenuation to beta particles of a given energy, so that a mathematical analysis of the TLD responses would give an indication of the energy distribution of beta particles striking the dosimeter.

PNL MULTI-ELEMENT BETA DOSIMETER DESCRIPTION

PHYSICAL DESCRIPTION OF THE DOSIMETER

The researchers developing this dosimeter wanted to demonstrate that passive beta dosimetry could be accomplished without the resources of a sophisticated laboratory, but could rather be done adequately using the resources available to most health physicists. The holder was made of heavy fiberboard and aluminum. The shields were made of either aluminum or aluminized mylar. The phosphor selected for this dosimeter is 35-mil thick TLD-700, manufactured by Harshaw, a type commonly used by health physicists. Each shield covers three TLD chips; this report refers to each set of three chips and the accompanying shield as a dosimeter element. Two versions of the multi-element dosimeters have been used. The original four-element design did not yield the desired degree of separation for lower energy beta spectra. Therefore, three additional thin shields were added to bring the total to seven. Each dosimeter package is comprised of two four- or seven-element dosimeters placed back-to-back. Thus the four-element dosimeter contains 24 TLD dosimeter chips, and the seven-element dosimeter contains 42 chips. (See Figure 1. This is actually a picture of the new eight-element dosimeter; the seven-element dosimeter is identical except that it has no 1-mil shield.)

It is desirable to have a compact unit that is easy to handle. A small size is also desirable to minimize the effect of a radiation field that varies with position. The final version of the dosimeter is no larger than a pocket calculator. Because most beta dosimetry is performed in fields of mixed gamma and beta radiation, it was considered important to be able to derive separate dose values for gammas and betas. This requirement is met through the attenuation of the various shields.

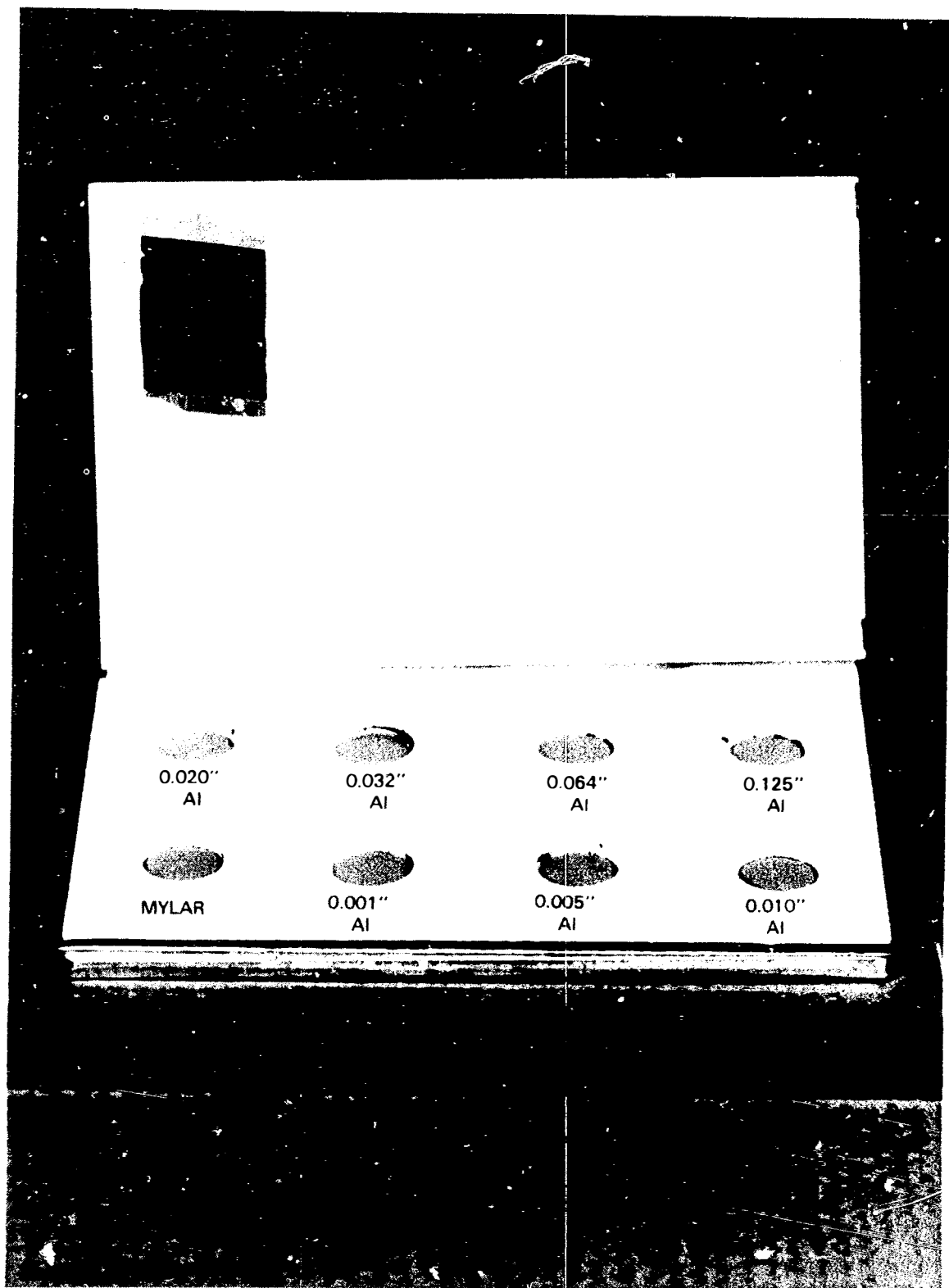


FIGURE 1. PNL Eight-Element Dosimeter

DOSIMETER SHIELD CHARACTERISTICS

All of the shields used in the multi-element dosimeter are made of aluminum (see Figure 2). In the case of the thinnest shield, 2×10^{-6} in., the aluminum is deposited on a mylar film. The other six shields in the seven-element dosimeter are square sheets of aluminum measuring 1.91 cm (3/4 in.) on a side. They have thicknesses of 0.013 cm (0.005 in.), 0.025 cm (0.010 in.), 0.051 cm (0.020 in.), 0.081 cm (0.032 in.), 0.163 cm (0.064 in.), and 0.318 cm (0.125 in.), respectively. (The four-element dosimeter used only the 0.051-cm, 0.081-cm, and the 0.318-cm shields.) The mass thickness can be obtained by multiplying by the density of aluminum, $2.7 \times 10^3 \text{ mg/cm}^3$. The mass thicknesses of the shields range from 0.013 mg/cm^2 to 860 mg/cm^2 . This information can be applied to the appropriate range-energy curve (Figure 3) (Evans 1955) to determine the attenuation of the various shields. For example, beta particles with an energy of 1.9 MeV or less will be stopped by the thickest shield, whereas betas with energies greater than 180 keV will penetrate the 0.013-cm thick shield. Although not shown on the curve, the aluminized mylar film will stop only those beta particles with energies less than 3 keV. None of the shields will significantly affect the penetration of gamma photons with energies greater than 40 keV.

The response of TLDs shielded as described above are shown in Figures 4 and 5 (Endres, Scherpelz and Roberson 1982). In these figures, TLD responses are presented for seven-element dosimeters exposed to different sources of beta and photon radiation. The TLD response is listed in units of nanocoulombs (nc), corresponding to the light output from a TLD reader used to analyze exposed TLDs. Since the sources had differing intensities, the TLD responses in nc were divided by the dose delivered to the dosimeter (specifically the dose to the mylar-covered TLDs), producing normalized responses in units of nc/rad. These TLD responses for each dosimeter element were plotted against the thickness of the aluminum shield covering the TLDs. These empirical results seem to agree well with the results of the beta range-energy curve, with TLD response decreasing as a function of shield thickness. Nearly all the beta particles emitted by $^{90}\text{Sr}/^{90}\text{Y}$ (maximum energy 2.3 MeV) are stopped by the thickest filter.

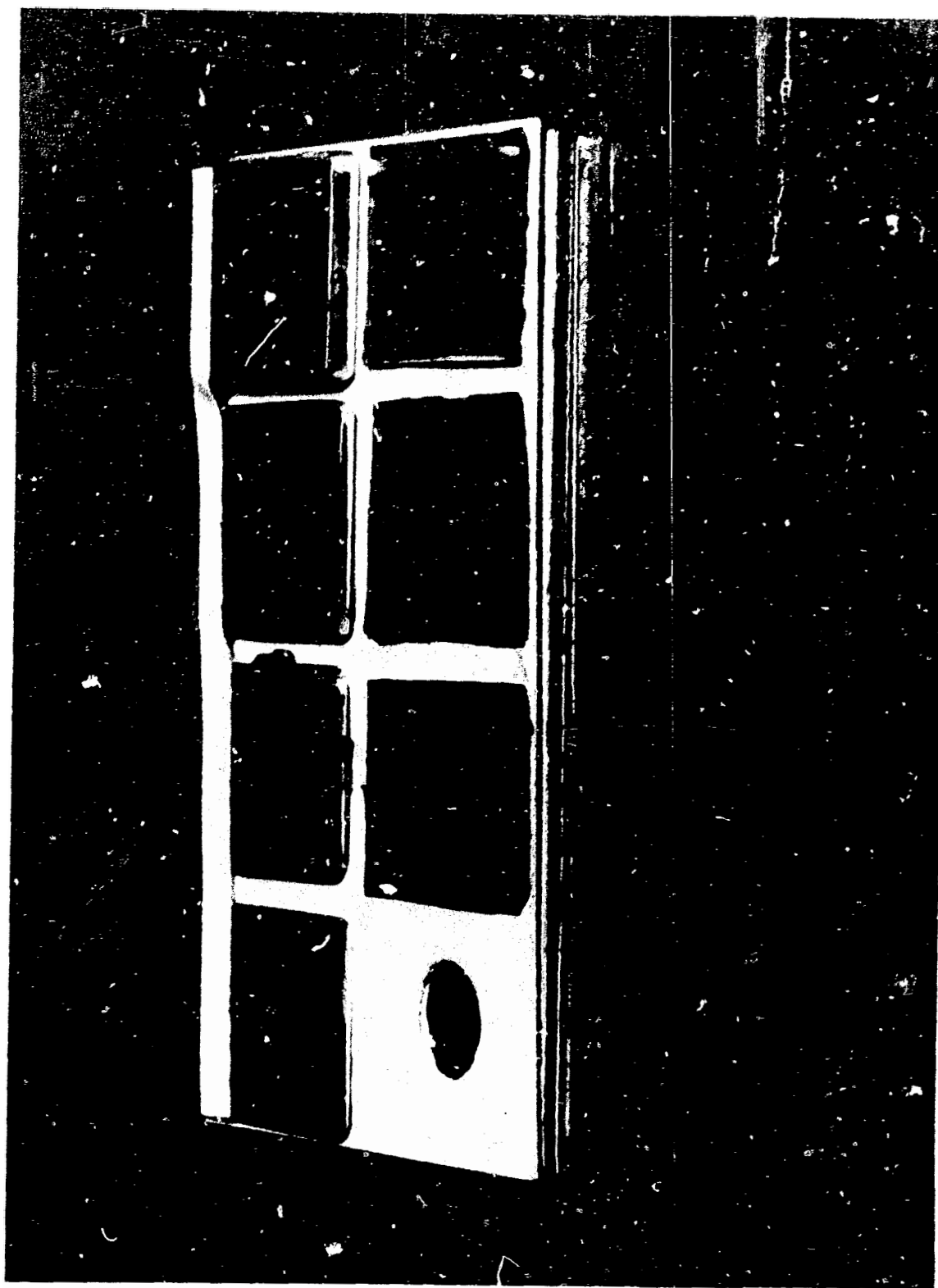


FIGURE 2. PNL Eight-Element Dosimeter Shields

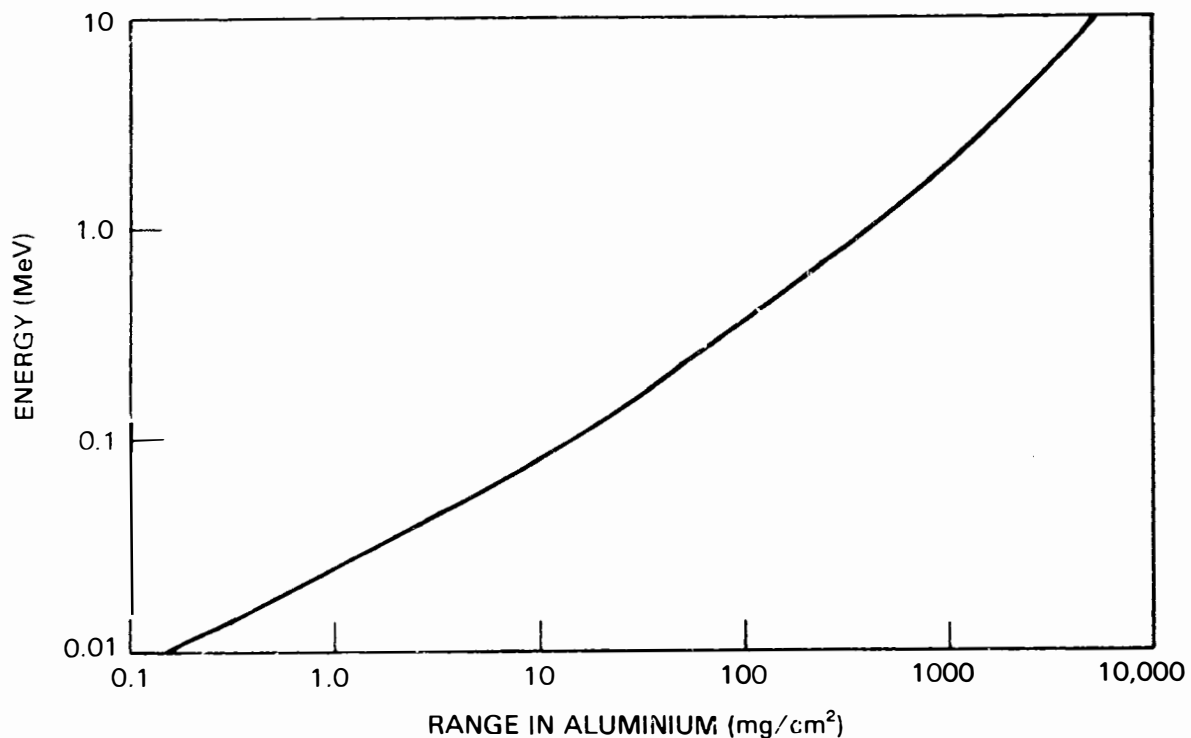


FIGURE 3. Beta Particle Range-Energy Curve

In Figure 4, natural uranium beta particles have an $E_{\max}$ similar to $^{90}\text{Sr}/^{90}\text{Y}$, but the simultaneous emission of low energy photons increases the dose to the TLD behind the thickest shield. The $^{106}\text{Ru}/^{106}\text{Rh}$ source ($E_{\max}$, 3.5 MeV) irradiated the TLDs behind the thickest shield, but the two low energy beta sources, ^{85}Kr and ^{147}Pm , failed to irradiate the TLDs behind the 0.051-cm shield. Finally, the beta particles from the $^{137}\text{Cs}/^{137m}\text{Ba}$ source were stopped by the material encapsulating the source; the only TLD exposure was a result of the 662 keV gamma photons.

The PNL multi-element TLD dosimeters allow the user to make a correction for beta energy when converting the TLD data to dose values. Other beta dosimeters, including one type that was recently compared to the PNL multi-element dosimeter in a test at TMI-2, do not provide beta energy correction factors. The importance of making an energy correction is illustrated by Figures 6 and 7. Each graph compares two sets of dosimeters exposed to beta radiation at the same location. The ratios of indicated beta dose rates are plotted on the vertical axes, with logarithmic scales. The horizontal axes of

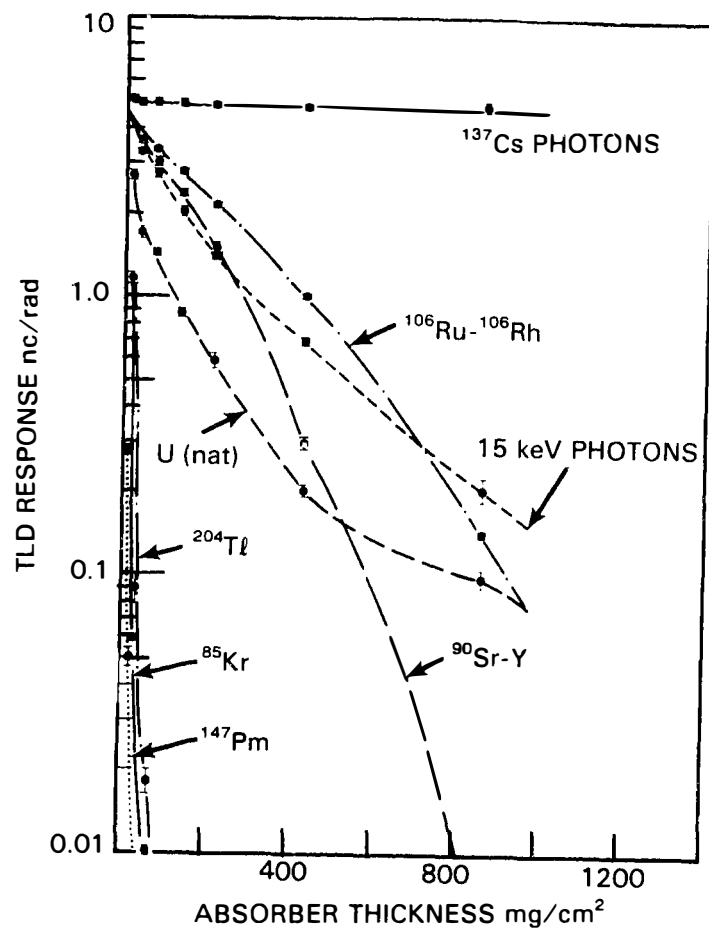


FIGURE 4. Beta Response - Seven Element Dosimeter

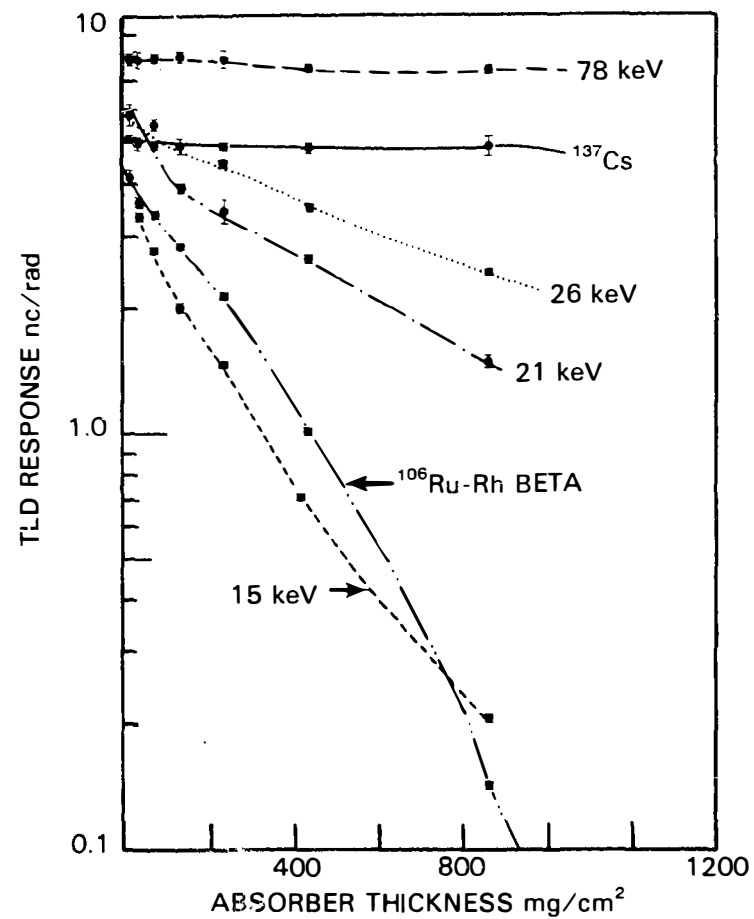


FIGURE 5. Photon Response - Seven Element Dosimeter

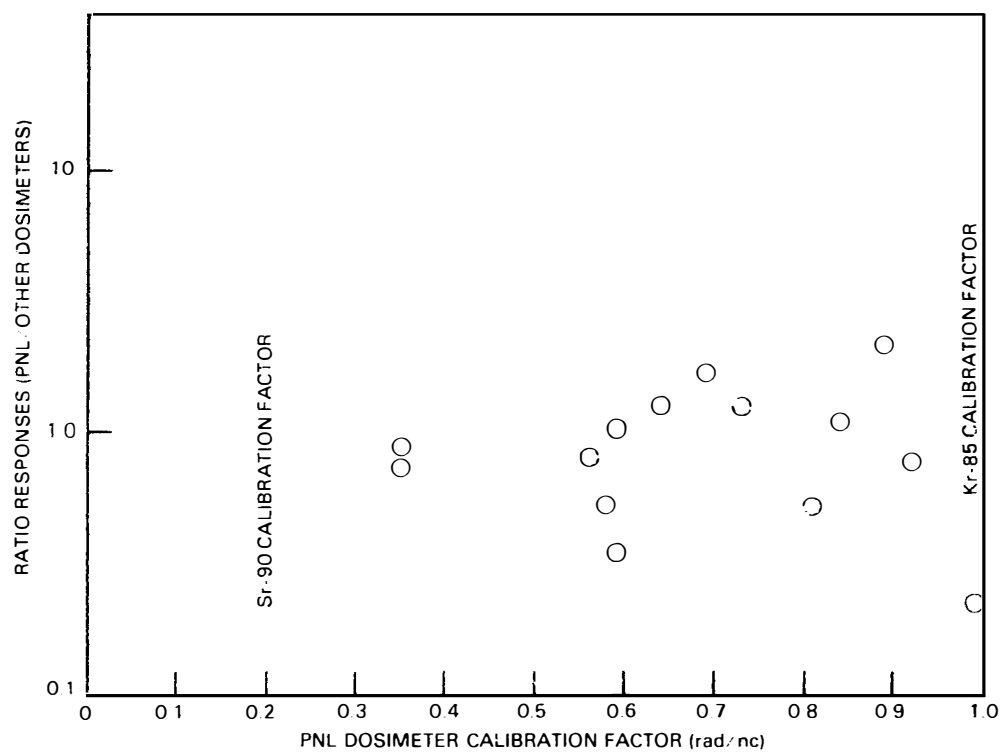


FIGURE 6. Comparison of PNL and Vendor 1 Dosimeters

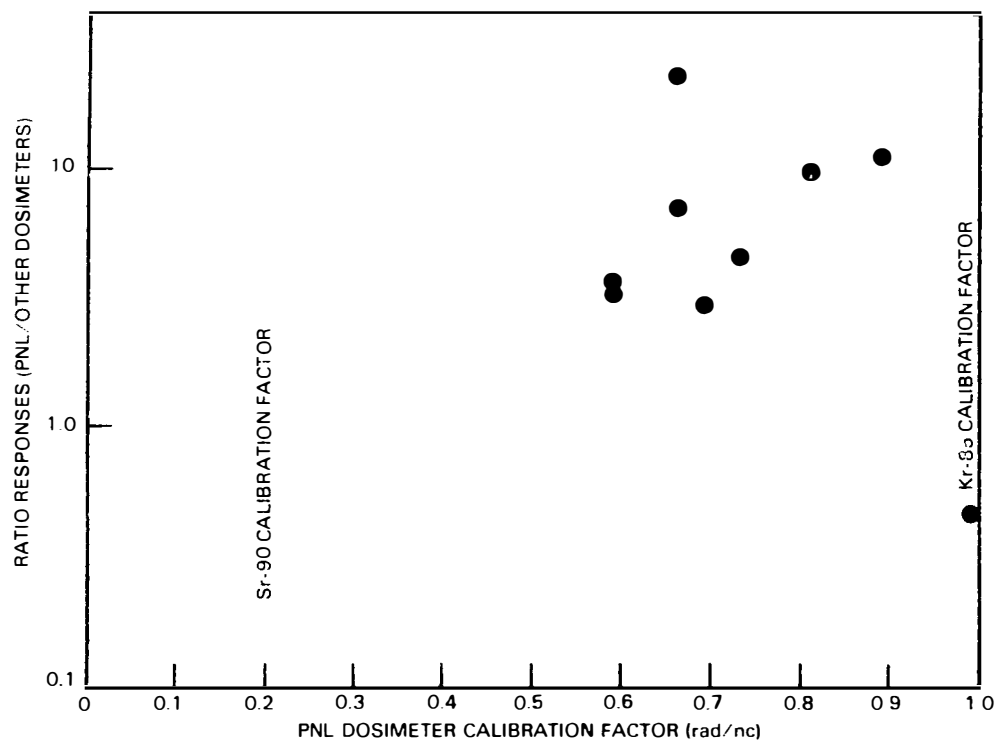


FIGURE 7. Comparison of PNL and Vendor 2 Dosimeters

these figures are used for presenting calibration factors, the values used to convert dosimeter response to dose. The calibration factors for the PNL dosimeters vary with energy, and in these studies this factor ranged from 0.35 to 0.99 rad/nc. Because the dosimeters from Vendor 2 rely on a single calibration factor, their dose determinations will be dependent on the source of calibration. If these dosimeters were calibrated with ^{90}Sr , a popular calibration source, the indicated dose could underestimate, by as much as a factor of 5, the dose as determined by PNL dosimeters. Because TLDs are known to have an energy-dependent response to beta radiation, PNL's TLD dosimeter results are expected to be more accurate than dosimeters using a fixed calibration factor.

CHARACTERISTICS AND QA PROCEDURES FOR THE TLDs

The TLDs used in the multi-element beta dosimeter are 0.318 cm by 0.318 cm by 0.089 cm (1/8 in. by 1/8 in. by 0.035 in.) ^7LiF ribbons (chips) with a mass of about 25 mg. They are available from the Harshaw Chemical Company as TLD-700s. The energy absorption characteristics of these TLDs to beta and gamma radiation resembles that of tissue. Lithium fluoride has an effective atomic number for photoelectric absorption of 8.14, compared with 7.42 for tissue and 7.64 for air. These high sensitivity ribbons are optically transparent, mechanically rugged, and conveniently handled.

When crystalline LiF is exposed to ionizing radiation at room temperature, electrons in the valence band are raised to the conduction bands. Imperfections in the LiF crystal lattice produced by dopants can trap the free electrons. Heating the LiF gives the electrons the additional energy that they need to escape the traps and return to the valence band. As the electrons return to a lower energy level, they emit visible light (3500-6000 Å). The amount of light emitted is proportional to the number of trapped electrons and is therefore proportional to the radiation dose.

The TLD-700 dosimeters are typically made in batches of thousands from the same batch of TLD powder. The manufacturer visually examines a representative statistical fraction of every batch for apparent defects and checks for thermoluminescent response at an exposure of 1 roentgen using a ^{60}Co source. The resulting TL response data are analyzed by a computer code which provides mean sensitivity and standard deviation data. These data are expressed as

percentage of the mean and stored by batch number for future reference. In a batch of thousands the typical measured standard deviation in sensitivity is in the range of 2% to 5% of the mean. Batch to batch means vary by less than 5%.

Batches of TLD material used in multi-element dosimeters receive additional screening at the PNL TLD Laboratory after receipt from the manufacturer. In the PNL screening, samples of 200 or more TLDs randomly selected from each new batch are annealed along with samples of 20-25 chips from an original reference set of TLD material and 20-25 chips from the set used in special studies. The chips are spread in vicor dishes and placed in a 400°C furnace under a nitrogen atmosphere for 1 hour, then transferred to a 100°C oven. After 2 hours, TLDs are placed in a low-background storage cave, where they are held for at least 24 hours. All transfers of heated chips are performed under dim light to avoid ultraviolet sensitization of the LiF.

After annealing, the samples are loaded into cardboard holders and irradiated with 250 mR gamma from a ^{137}Cs calibration source (off-phantom). A hot gas reader is normally used to compare light outputs. If the laboratory planchet reader is used, sample sizes are reduced. Sample means and standard deviations are calculated for each group. The irradiation/readout process is repeated twice to simulate the effects of reader annealing.

Batches are accepted if the sample mean falls within 5% of both reference sample means and the sample standard deviation is less than 10%. When the mean or standard deviation does not fall within acceptable limits, the batch sample and reference samples are reannealed and rescreened; the laboratory anneal will often stabilize chip responses sufficiently for samples to pass a second screening. If a sample is accepted after a second anneal and screening, the entire batch is annealed before use.

The LiF TLDs have a response that is a well-defined function of dose over the range of 10 mrad to 100,000 rad. When PNL's standard quality control procedures are observed, the TLD-700s can measure doses as low as 10 mrad with a standard deviation of less than 10%; higher doses can be measured with standard deviations as low as 2%. If several TLDs are used, doses as low as a few mrad can be measured by the TLD-700, but with standard deviations greater than 10%.

CALIBRATION AND MEASUREMENT

TLD READER SYSTEM

The instruments used to measure the energy absorbed by the TLDs in the multi-element dosimeter consist of a Harshaw Model 2000-A thermoluminescence analyzer and a Harshaw Model 2080 picoprocessor (see Figure 8). The thermoluminescence analyzer provides a means of heating the TLDs at a constant rate and uses a photomultiplier tube for measuring the amount of light produced (see Figure 9). The amount of light striking the photo-cathode of the photomultiplier tube is proportional to the energy absorbed by the TLDs.

The picoprocessor, or microprocessor-based picoammeter, allows for CRT presentation and storage of digitized glow curves. A glow curve is a plot of light output versus temperature for a TLD. A typical glow curve is evident on the video screen in Figure 8. Figure 10 presents a detailed representation of a glow curve for a TLD-700 read out in the PNL TLD Laboratory. An integration of the area under the glow curve represents the total light output of the TLD. This is the method used to analyze the TLDs from the PNL multi-element dosimeters. From the total light output, the dose to the TLD can be derived.

It is not necessary to use the new picoprocessor described above for glow curve analysis. Any good TLD reader with an x-y plotter is adequate. Calibration of the Model 2000-A thermoluminescence analyzer is checked through the use of a built-in ^{14}C carbon-activated sodium iodide (TI) light source. The Model 2080 picoprocessor has an internal, electronic calibration source and the calibration can be checked from the keyboard. The complete system is checked with a set of reference TLD chips. These TLDs are irradiated with a gamma ray source of known strength such that a wide exposure range is obtained. The readout of the prepared standards gives a calibration curve in exposure versus charge.



FIGURE 8. Harshaw Thermoluminescence Analyzer and Picoprocessor

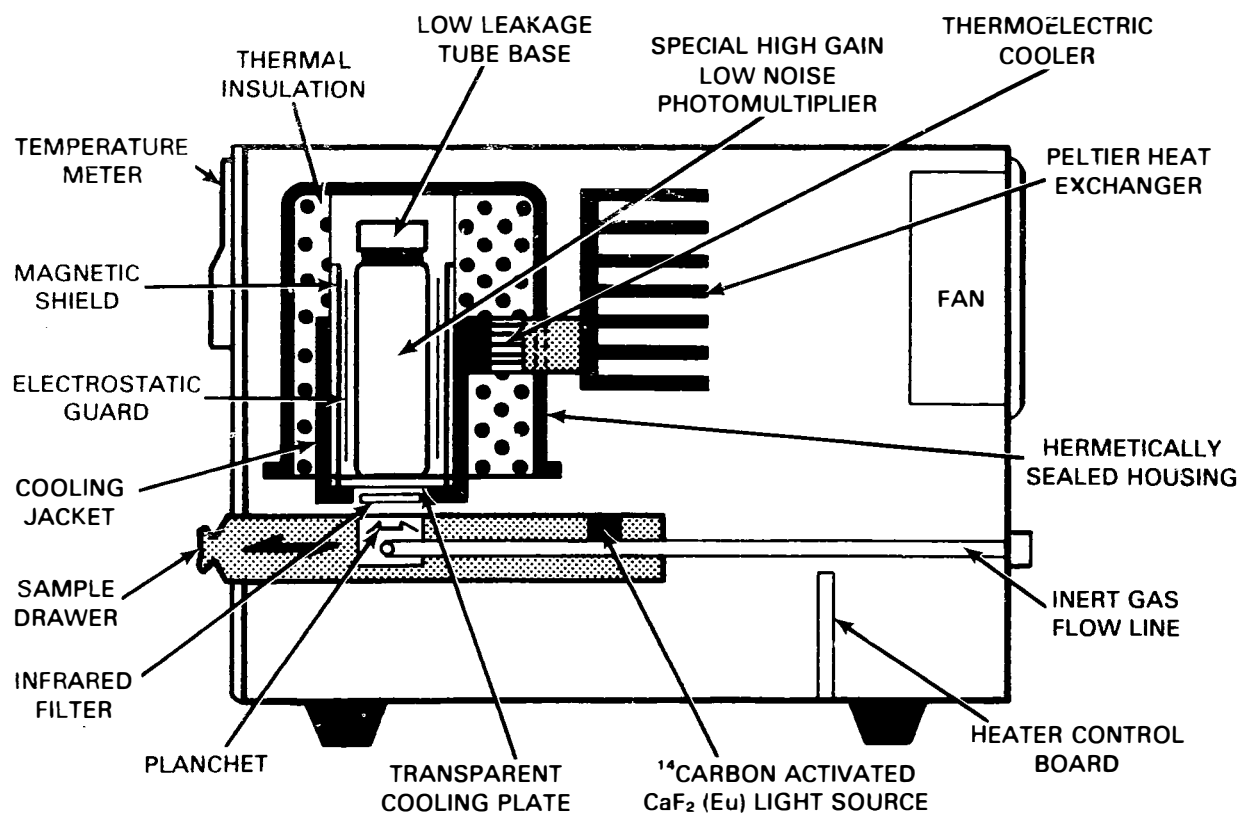


FIGURE 9. Physical Layout of Thermoluminescence Analyzer

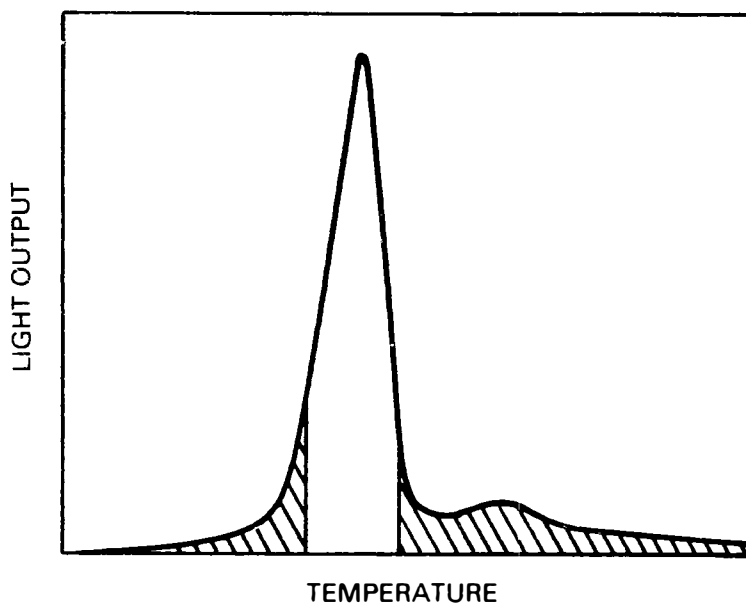


FIGURE 10. Typical TLD reader Glow Curve for a TLD-700

MULTI-ELEMENT DOSIMETER CALIBRATION

The multi-element beta dosimeters were calibrated by exposing them to known radiation sources at the PNL Calibrations Laboratory. The beta sources used in these calibrations and the maximum energies of the emitted betas are presented in Table 1. The responses of the dosimeters to these calibration sources are presented in Figure 4.

TABLE 1. Beta Calibration Sources

<u>Nuclide</u>	<u>Maximum Beta Energy (MeV)</u>
^{147}Pm	0.23
^{85}Kr	0.62
^{204}Tl	0.76
$^{90}\text{Sr}/^{90}\text{Y}$	2.3
$^{106}\text{Ru}/^{106}\text{Rh}$	3.5

The dosimeters were also exposed to calibrated sources of x rays with energies ranging from 15 to 78 keV, and to a calibrated $^{137}\text{Cs}/^{137\text{m}}\text{Ba}$ source emitting 662-keV gammas. These measurements characterized the response of the dosimeters to photons. The responses of seven element dosimeters to these photon sources are presented in Figure 5. These studies demonstrated that the attenuation of photons is dependent on shield thickness if the energies are less than about 40 keV, but for photons with higher energies, the TLD response is fairly uniform for all elements. This characteristic of the dosimeter allows the use of the element with the thickest aluminum filter to be used as an indicator of gamma dose. The beta calibration studies summarized in Figure 4 show that the element behind the 0.318-cm Al filter is very nearly insensitive to betas. A calibration factor for gammas was thus determined from the irradiation by $^{137}\text{Cs}/^{137\text{m}}\text{Ba}$ to be 0.204 rad/nc. This value can be multiplied by the response of the 0.318-cm Al-filtered element of any exposed dosimeter to determine the gamma dose. The TLD response of this element can also be subtracted from the TLD response of all other elements in an exposed dosimeter to obtain the beta components of the element responses.

The data from these calibration studies were used to derive calibration data used in determining the beta doses from field-exposed dosimeters. For each dosimeter exposed to a calibrated beta source, a beta "Calibration Factor" (CF) was determined by subtracting the gamma component (the reading of the element covered by the 0.318-cm Al shield) from the TLD response of the mylar-covered shield, and dividing this value (in nanocoulombs) into the beta dose (in rads) absorbed by the mylar-covered TLDs during the calibration measurement. The beta dose delivered by the calibration source is defined as the dose to tissue at a depth of 7 mg/cm^2 . This factor could then be used to convert the responses of other dosimeters to a 7 mg/cm^2 dose, as long as the dosimeters were exposed to a field of betas with the same energy distribution as the beta calibration source. For each of the five elements with aluminum shields between 0.013 and 0.163 cm thick, the ratio of the element's beta response to the mylar-covered element's beta response was found for each calibration measurement. This ratio was a function of the calibration source's energy distribution: high beta energies resulted in high values of these ratios.

This data was plotted in Figure 11 for the most useful beta calibration measurements for each element. The Calibration Factor is plotted on the vertical scale and the CF value for each beta calibration source is identified. The element ratios are plotted on the horizontal scale. The points on the graph are the observed values for each of the element in each of the irradiations (the error associated with each point is less than 5%), and the lines are linear equations fitted to the observed values.

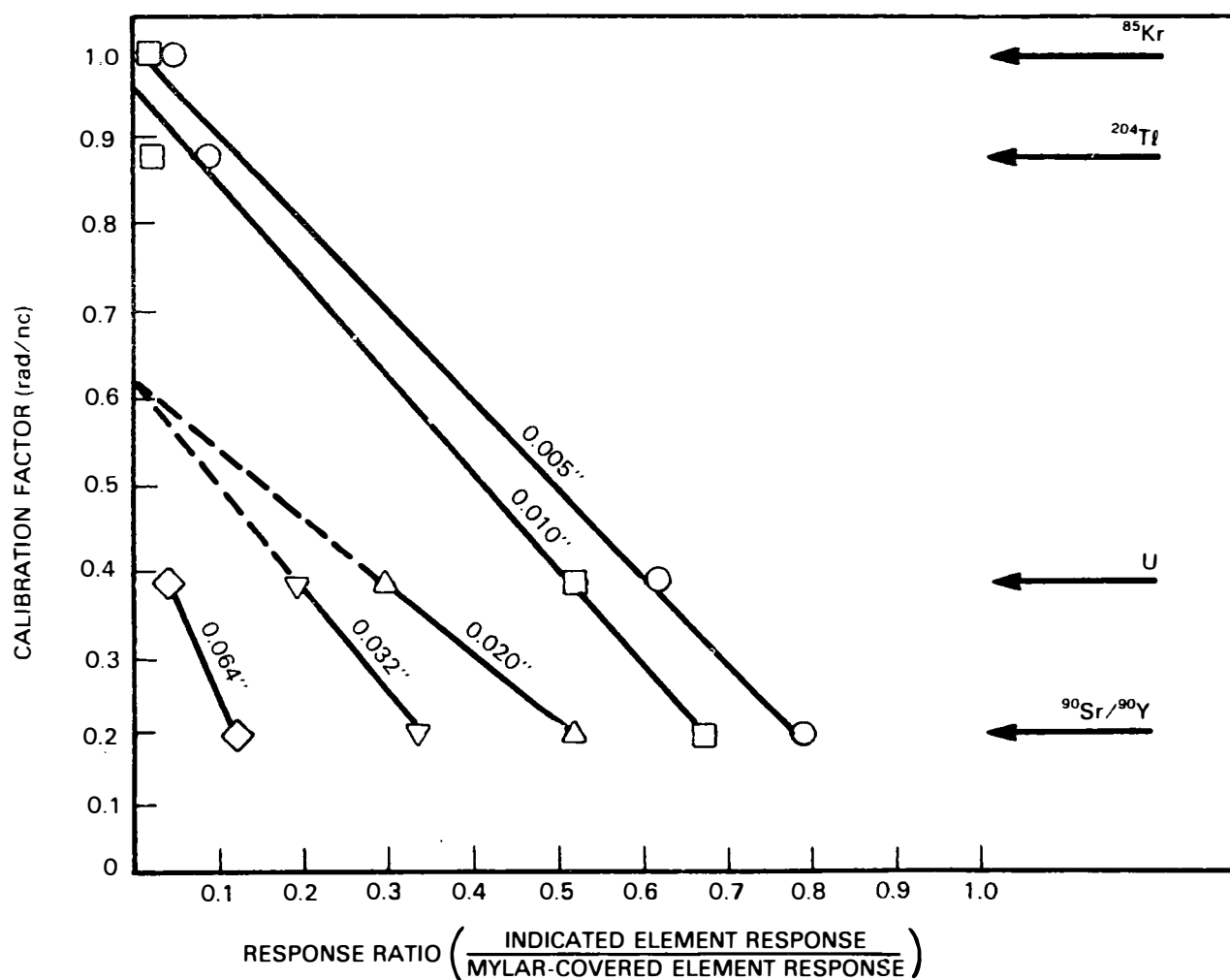


FIGURE 11. Calibration Factors Versus Element Ratios

DATA ANALYSIS METHOD

When exposed dosimeters are analyzed to determine the doses they were exposed to, the first task is to disassemble the dosimeters and extract the TLDs. As the TLDs are taken from the dosimeters, they are read out in the thermoluminescence analyzer and picoprocessor. This analysis results in TLD responses in units of nanocoulombs of light output. The TLD responses are then used as raw data in a computer program which converts the TLD responses to absorbed doses. This program first finds the gamma component of each dose, then subtracts the gamma response from each element response, and determines the ratios of Al-covered elements to the mylar-covered element. It uses these ratios, which are an indication of the beta energy spectrum, to select the appropriate calibration factor. This calibration factor is then multiplied by the mylar-covered element's response to determine the beta dose. This procedure will be illustrated by a sample dosimeter analysis.

The input data for the computer program consists of the TLD responses for all chips in the dosimeter. The program first looks at the TLD responses in sets of three for each element. Ideally these three chips should all have nearly identical readings. The program finds the mean and standard deviation for each set of three, and if a standard deviation is greater than 5%, it checks to see if two of the readings are close to each other; if so it rejects the "flier," and uses the mean value of the other two. If all three readings are quite dissimilar, it rejects all three if the element is one of 4, 5, or 6 (of the seven-element dosimeter); otherwise it accepts all three. This system is necessary to preserve data that is necessary for the analysis, but reject suspicious data that is unessential and may confuse the results.

Table 2 presents the "raw" data from a four-element dosimeter for an example data analysis to illustrate the operation of the computer code. In this example only the mean values of the three TLD readings for each element are recorded.

TABLE 2. Raw Data for Exposed Four-Element Dosimeter

<u>Shield</u>	<u>Gamma + Beta (nc)</u>	<u>Beta (nc)</u>
Mylar	543.0	200.6
0.051 cm Al	406.9	64.4
0.081 cm Al	366.0	23.6
0.318 cm Al	342.5	0

The reading for the TLDs under the thickest filter was used to indicate the gamma dose, and this value was subtracted from the other element readings to get responses due to betas alone. Ratios were then determined for the elements under each of the two thinnest aluminum shields to the mylar-covered element, and these two ratios indicated the energy distribution of the beta radiation incident on the dosimeter. These ratios were used to select the appropriate energy-dependent beta calibration factor for each shield from the set of calibration factors determined by the calibration irradiations. The CF values were determined by applying the fitted equations shown in Figure 11. These equations are listed in Table 3.

The average of the two calibration factors found by equations for #4 and #5 was then multiplied by the mylar-covered element's beta response to determine the beta dose. The worksheet for these calculations based on the raw data of Table 2, is presented in Table 4.

TABLE 3. Equations for Converting Element Ratios to Calibration Factors

<u>Element</u>	<u>Shield Thickness (cm)</u>	<u>Equation</u>
2	0.013	$CF = -1.0032 * R + 0.9943$
3	0.025	$CF = -1.0960 * R + 0.9471$
4	0.051	$CF = -0.7438 * R + 0.6028$
5	0.081	$CF = -1.1420 * R + 0.5885$
6	0.163	$CF = -6.1597 * R + 0.6215$

TABLE 4. Analysis of Exposed Four-Element Dosimeter

<u>Shield</u> <u>(cm)</u>	<u>Ratio</u>	<u>Beta Calibration Factor</u>	
		<u>Element</u> <u>(rad/nc)</u>	<u>Average</u> <u>(rad/nc)</u>
0.051 Al	0.321	0.364	0.409
0.081 Al	0.118	0.454	

Beta Dose = (201 nc) * (0.409 rad/nc) = 82.4 rad

Gamma Dose = (342 nc) * (0.204 rad/nc) = 69.8 rad

The final two lines of Table 4 show the conversion of TLD response to dose. The beta dose calculation uses the beta component of the mylar-element response, with the calibration factor selected in Table 4. The gamma dose calculation uses the TLD response from the element shielded by the thickest aluminum shield, with a gamma calibration factor determined by the calibration irradiations.

A similar method of using beta-component responses to calculate ratios of aluminum-shielded elements to mylar-shielded elements was used in the analysis of data from seven-element dosimeters. A set of raw data from a seven-element dosimeter is presented in Table 5.

TABLE 5 Data for Exposed Seven-Element Dosimeter

<u>Element</u>	<u>Shield</u>	<u>Gamma + Beta</u> <u>(nc)</u>	<u>Beta</u> <u>(nc)</u>	<u>Element</u> <u>Ratio</u>	<u>Calibration</u> <u>Factor</u>
1	Mylar	240.3	79.8	1.0	-
2	0.013 cm Al	191.5	31.0	0.3887	0.6044
3	0.025 cm Al	185.5	25.0	0.3132	0.6038
4	0.051 cm Al	177.0	16.5	0.2071	(0.4488)
5	0.081 cm Al	163.1	2.6	0.0322	(0.5517)
6	0.163 cm Al	158.7	0	0	(0.6215)
7	0.318 cm Al	160.5	0	0	-

The gamma dose for this example was found by multiplying the TLD response of element 7 by the gamma calibration factor:

$$(160.5 \text{ nc}) * (0.204 \text{ rad/nc}) = 32.7 \text{ rad.}$$

To evaluate the beta dose, a calibration factor could have been found by averaging the CF values for elements 2-6: 0.566 rad/nc. However, it would be poor practice to include element 6 in the beta calibration factor determination, since no betas penetrated the filter--the TLD response was zero. Therefore limits were set on the ratios of each element: if the ratios were below the lower limits, the element was disregarded in the beta CF determination. If the ratio was above the upper limit, the CF for a $^{90}\text{Sr}/^{90}\text{Y}$ spectrum was assigned to that element. The reasoning for setting the lower limit was to avoid using the results of thick-filtered elements in a low-energy field where these elements would be insensitive. From the results of the calibration studies, the lower ratio limits were set for elements 4, 5, and 6 as the ratio values corresponding to the uranium spectrum. No lower limits were set for the two thin-aluminum-filtered elements (2 and 3), since these are the most sensitive for the low-energy fields. Upper limits were set for all elements, 2-6, corresponding to ratios for a $^{90}\text{Sr}/^{90}\text{Y}$ beta field. The linearity of the ratio-CF equations are suspect for beta energies above this limit, so the conservative assumption was made to assign the $^{90}\text{Sr}/^{90}\text{Y}$ CF value to any element response with a ratio higher than this limit ratio value. The average CF for a dosimeter exposure was therefore found as the average of the CF values for all elements with ratios above the lower limit. For this example, the average of CF values for elements 2 and 3 was 0.6041 rad/nc. Thus the beta dose was calculated as:

$$(79.8 \text{ nc}) * (0.6041 \text{ rad/nc}) = 48.2 \text{ rad.}$$

The discussion of limits to the ratio values illustrates the advantage of the seven-element dosimeter over the four-element dosimeter. In the four-element dosimeter a lower limit could not be set for the two important aluminum-covered elements, since the two thinnest filters were not available.

(In Figure 11 the equations for these two elements were shown as dashed lines above the uranium CF, showing that these segments were used for the four-element dosimeter analysis, but not for the seven-element dosimeter analysis.) Thus in low-energy beta fields we had to rely on the ratios from the 0.051-cm and 0.081-cm Al filters, even though the 0.013-cm and 0.025-cm filtered elements would have given more reliable CF values.

A computer code, RAT1C7, has been written and used at PNL for the dosimeter data analysis. This code is listed in Appendix I.

Error Analysis

The major components of the error in a dosimeter measurement comes from uncertainties in:

- TLD chips
- TLD reader
- Calibration measurement and curve fitting
- Dosimeter placement and irradiation.

A thorough analysis of the measurement errors would involve isolating each individual factor affecting each component identified above, determining the variability of each factor, and combining all of these factors into one mathematical expression. A similar study was performed for the Hanford Multipurpose Dosimeter, and this study was recently published (Fi81). Since this type of error analysis is beyond the scope of this study, the errors in each dosimeter measurement were empirically approximated based on the results of each dosimeter's analysis.

The basic formula for converting a dosimeter response to measured dose is:

$$D = CF * TLD,$$

where D is the dose, CF is the calibration factor, and TLD is the TLD response of the appropriate element (for gammas, #7; for betas, #1 with gamma response subtracted off). The error analysis for these dosimeters consists of evaluating the observed variation for each of the two components, CF and TLD, and combining these into a total error for the measurement. The variation in CF

for betas is found by evaluating the standard deviation of the individual element CF values that are averaged to find the CF value used to determine the beta dose. The standard deviations of the three TLD counts for elements 1 and 7 were also evaluated and combined for the beta error:

$$\sigma_{\text{TLD}} = \sqrt{\sigma_{\text{TLD-1}}^2 + \sigma_{\text{TLD-2}}^2}$$

These two standard deviations were then combined to get the total beta error:

$$\sigma_D = D \sqrt{\frac{\sigma_{\text{CF}}^2}{\text{CF}^2} + \frac{\sigma_{\text{TLD}}^2}{\text{TLD}^2}}$$

The error for the gamma dose was found in a similar manner, using the same equation for σ_D . However, since a fixed value was used for CF, the standard deviation for CF was fixed at $0.093 \cdot \text{CF}$, based on uncertainties in the calibration measurements. σ_{TLD} was simpler for the gamma dose than for the beta dose, simply the standard deviation of the three TLD chips in element 7, the element used for the gamma dose determination.

COMPILATION OF DATA

DESCRIPTION OF EXPERIMENTS

Multi-element beta dosimeters have been exposed in three sets in the containment building of the Three Mile Island Unit II reactor. The three sets were used in the following experiments:

- pre-gross decontamination experiment
- post-gross decontamination experiment
- pre-flushing TLD tree.

In the pre-gross decontamination experiment, dosimeters were exposed between December 3 and December 15, 1981. Ten dosimeters were used in the vicinity of the dome monitor and on the elevator shaft roof, thirteen were placed on the 305 ft elevation, and 15 were placed on the 347 ft and 367 ft elevations. These dosimeters were returned to PNL and read out in the TLD readers in February 1982. The computer run used to analyze the data is presented in Appendix II. A summary of the dosimeter placements and the resulting dose rates are presented in Figures 12a, 12b, and 12c; and in Tables 6a, 6b, and 6c.

Tables 6a through 9 list four dose rates for each dosimeter location: the beta dose rates for the front and back of the dosimeter and the gamma dose rates for the front and back. With each dose rate is listed the associated error, expressed as one standard deviation. In some dosimeter analyses this error was larger than the evaluated dose rate itself, and if this error were subtracted from the evaluated dose rate, the value would be less than zero. Such a value would, of course, be nonsense. Any dose rate of zero (or smaller) should be interpreted as being lower than the dosimeter's minimum level of detection.

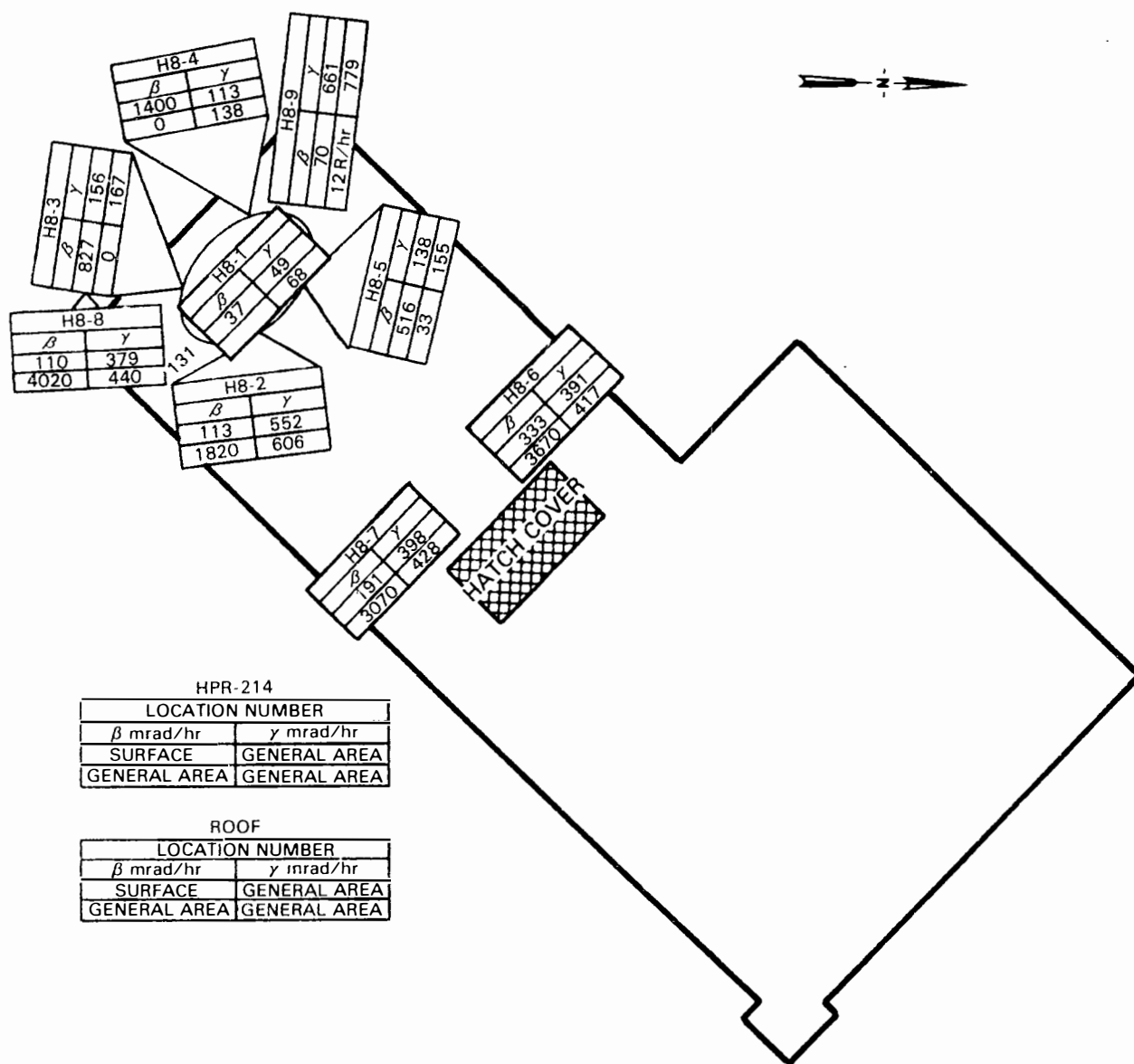


FIGURE 12a. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - Dome Monitor and Elevator Shaft Roof

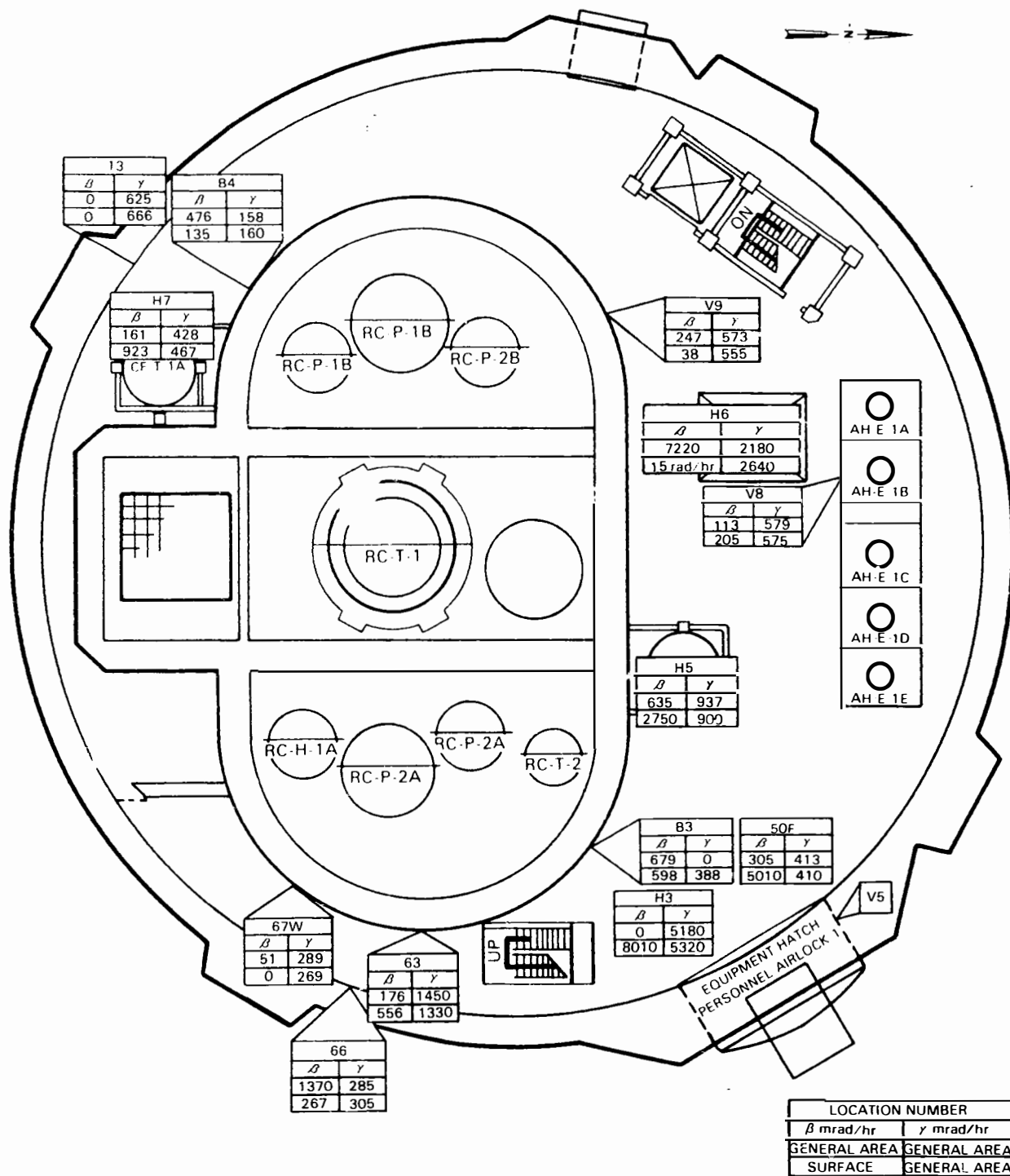


FIGURE 12b. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - 305 ft Elevation

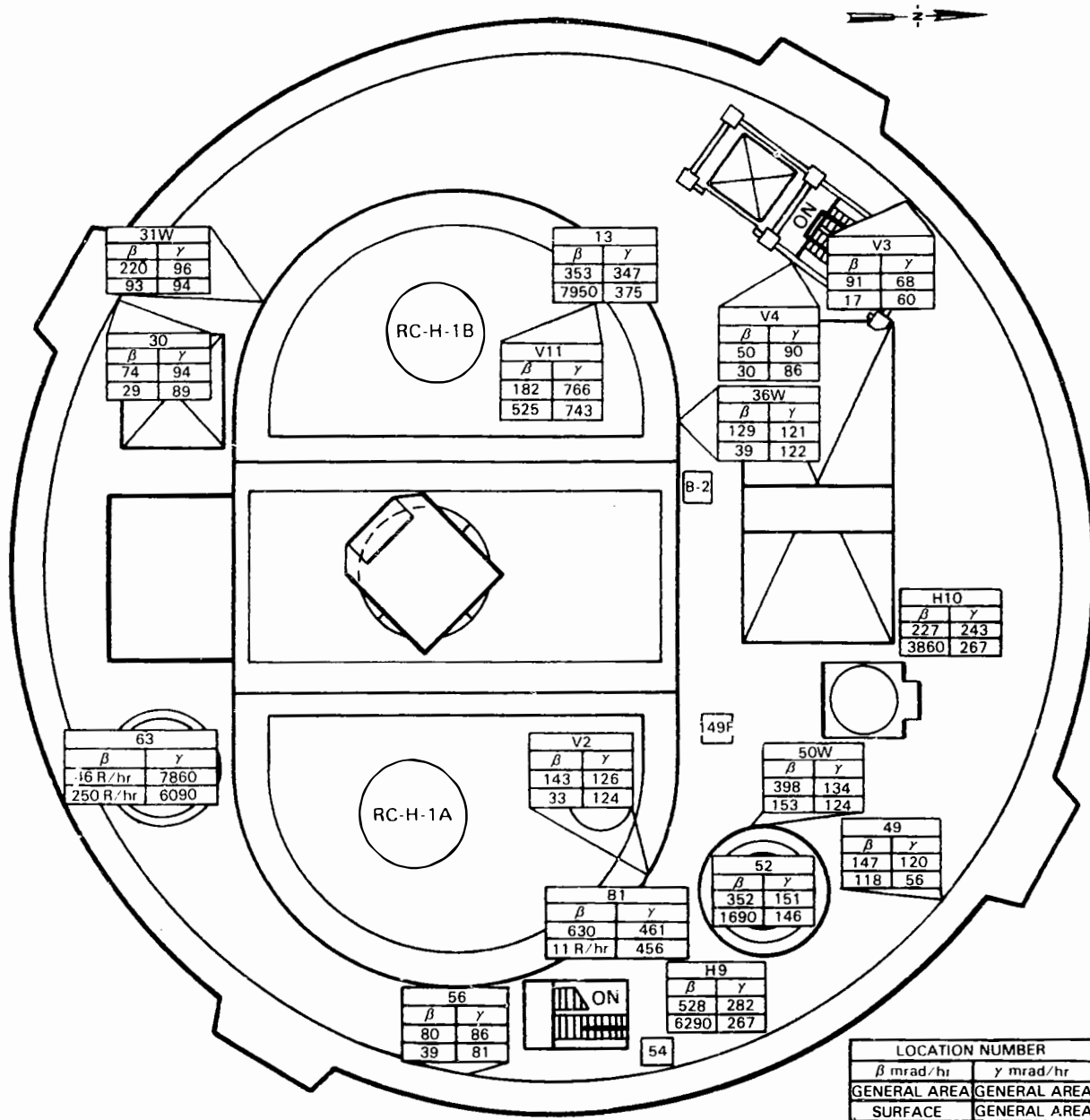


FIGURE 12c. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - 347 and 367 ft Elevation

TABLE 6a. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
Dome Monitor and Elevator Shaft Roof

Type Surface	TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
				In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
Vertical or Horizontal Surface of Dome Monitor	1	H8-1	Horizontal surface, top of monitor	12/3/81 12:00	12/15/81 12:00	288	37.0 ± 20.1	131 ± 125	48.8 ± 4.6	68.2 ± 12.1
	2	H8-2	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	113 ± 92	1820 ± 440	552 ± 52	606 ± 57
	3	H8-3	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	827 ± 57	0	156 ± 16	167 ± 16
	4	H8-4	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	1400 ± 89	0	113 ± 11	138 ± 14
	5	H8-5	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	516 ± 268	33.0 ± 22.9	138 ± 13	155 ± 15
Elevator Shaft Roof (Horizontal Surface)	6	H8-6	Facing stairs and in front of hatch, TLD on immediate right	12/3/81 12:00	12/15/81 12:00	288	333 ± 83	3670 ± 79	391 ± 39	417 ± 39
	7	H8-7	Facing stairs and in front of TLD on immediate left	12/3/81 12:00	12/15/81 12:00	288	191 ± 77	3070 ± 250	398 ± 40	428 ± 41
	8	H8-8	Facing stairs and back stairs, TLD on left corner of roof	12/3/81 12:00	12/15/81 12:00	288	110 ± 23	4020 ± 280	379 ± 36	440 ± 41
	9	H8-9	Facing monitor and back to stairs, TLD on right corner of roof	12/3/81 12:00	12/15/81 12:00	288	69.9 ± 33.5	11700 ± 3790	661 ± 63	779 ± 74
Control	10	H8-10	Carried to roof and brought out	12/3/81 12:00	12/3/81 13:00	1	45.9 ± 20.2	49.0 ± 33.3	221 ± 21	219 ± 21

Notes:

1. HPR-214
Horizontal and vertical measurements - front side of TLD system against monitor surface.
2. Elevator Roof Measurement
Horizontal measurements - back side of TLD system against roof surface.

TABLE 6b. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
305 Foot Elevation

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
11	13	Vertical surface, taped to liner ~4 feet above floor, NE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	0	0	625 ± 62	666 ± 63
12	H7	Horizontal surface, taped to floor, NE area of Rx Bldg., SE area under CF-T-1A	12/9/81 1427	12/15/81 1838	148.2	161 ± 64	923 ± 575	428 ± 41	467 ± 45
13	B4	Vertical surface, taped to underside of junction box, NE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	476 ± 50	135 ± 16	158 ± 15	160 ± 15
14	V9	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	247 ± 104	38.5 ± 81.3	573 ± 55	555 ± 54
15	H6	Horizontal surface, taped to West area of hatch cover, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	7220 ± 481	14900 ± 10000	2180 ± 210	2640 ± 250
16	V8	Vertical surface, taped to front side of aircooler B ~4 feet above floor, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	113 ± 40	205 ± 100	579 ± 54	575 ± 57
18	H5	Horizontal surface, taped to floor, SW area of Rx Bldg., NE area under CP-T-1B	12/9/81 1427	12/15/81 1838	148.2	635 ± 283	2750 ± 1980	937 ± 110	900 ± 84
27	67W	Vertical surface, taped to D-ring wall ~4 feet above floor, NW area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	51.4 ± 39.5	0	289 ± 27	269 ± 26
26	66	Vertical surface, taped to liner ~4 feet above floor, NW area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	1370 ± 940	267 ± 54	285 ± 28	305 ± 31
25	63	Vertical surface, taped to D-ring wall ~4 feet above floor, W area of Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	176 ± 192	556 ± 319	1450 ± 140	1330 ± 130
23	H3	Horizontal surface, taped to floor, West area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	0	8010 ± 610	5180 ± 480	5320 ± 520
19	B3	Vertical surface, taped to underside of junction box ~8 feet off floor	12/9/81 1427	12/15/81 1838	148.2	679 ± 52	598 ± 49	0	388 ± 37
21	50F	Horizontal surface, taped to floor, SW area of Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	305 ± 91	5010 ± 920	413 ± 42	410 ± 39

TABLE 6c. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
347 and 367 Foot Elevations

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
29	30	Vertical surface, taped to liner ~4 feet above floor by hatch cover, NE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	74.1 ± 13.9	29.0 ± 14.0	94.0 ± 9.5	88.7 ± 8.3
	30	31W Vertical surface, taped to D-ring wall, ~4 feet above floor, NE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	220 ± 8	92.9 ± 9.9	95.7 ± 9.2	93.7 ± 9.0
	36	V3 Vertical surface, taped to liner behind enclosed stairwell ~4 feet above floor	12/9/81 1507	12/15/81 1838	147.52	90.9 ± 32.7	16.5 ± 9.6	68.1 ± 7.0	59.8 ± 5.6
	39	V4 Vertical surface, taped to outside enclosed stairwell wall ~4 feet above floor	12/9/81 1507	12/15/81 1838	147.52	50.0 ± 19.4	29.9 ± 7.7	90.1 ± 9.1	86.1 ± 8.5
	34	36W Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	129 ± 25	39.3 ± 17.5	121 ± 12	122 ± 11
	37	H10 Horizontal surface, taped to floor near SW corner of hatchcover, South area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	227 ± 42	3860 ± 600	243 ± 24	267 ± 27
	43	50W Vertical surface, taped to East side of head stand, SW area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	398 ± 32	153 ± 28	134 ± 14	124 ± 12
	44	52 Horizontal surface, taped to top of head stand, SW area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	352 ± 49	1690 ± 78	151 ± 15	146 ± 14
	51	V2 Vertical surface, taped to D-ring wall ~4 feet above floor, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	143 ± 26	32.9 ± 37.2	126 ± 12	124 ± 12
	50	B1 Horizontal surface, placed on floor below junction box, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	630 ± 95	11200 ± 470	461 ± 44	456 ± 47
	46	H9 Horizontal surface, taped to floor ~4 feet south of open stairwell, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	528 ± 319	6290 ± 340	282 ± 28	267 ± 26
	48	56 Vertical surface, taped to liner ~4 feet above floor, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	80.2 ± 17.4	38.9 ± 27.3	85.6 ± 8.1	81.1 ± 8.1
	49	63 Horizontal surface, West axis of in core instrumentation area	12/9/81 1507	12/15/81 1838	147.52	46400±14800	248000±21000	7860 ± 1280	6090 ± 640
	40	13 Horizontal surface, 367 foot elevation, top D-ring wall, East area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	353 ± 34	7950 ± 810	347 ± 32	375 ± 36
	41	V11 Vertical surface, 367 foot elevation, taped to inside D-ring wall, East area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	182 ± 136	525 ± 123	766 ± 72	743 ± 70

The post-gross decontamination experiment was performed between March 25 and April 22, 1982. Fourteen dosimeters were exposed on the 305 ft elevation, seventeen were exposed on the 347 ft elevation, and two were exposed on the 367 ft level. The dosimeters were read out in the PNL TLD Laboratory in May 1982. The computer runs analyzing these dosimeters are presented in Appendix II, and the dosimeter placements and evaluated dose rates are presented in Figures 13a and 13b and in Tables 7a and 7b.

In the pre-flushing TLD tree experiment, four multi-element dosimeters were placed on each of four TLD trees. These trees were lowered from the 305 ft elevation down into the reactor basement to measure radiation levels before flushing of the 282 ft elevation walls. Each tree also contained dosimeters provided by Panasonic and Harshaw, providing for rough comparisons between the different types of dosimeters. The dosimeters were exposed on June 22, 1982 for about three hours. The multi-element dosimeters were returned to PNL and the TLDs read out in July 1982. The computer analysis is listed in Appendix II. Figure 14 shows the placement of the TLD trees from the viewpoint of the 305 ft level and Table 8 describes the placement of the trees. Table 9 presents the dose rates determined from the PNL multi-element dosimeters and compares them to the doses determined by the Panasonic and Harshaw dosimeters. Comparisons of the doses determined by the different types of dosimeters are presented in Figures 6 and 7.

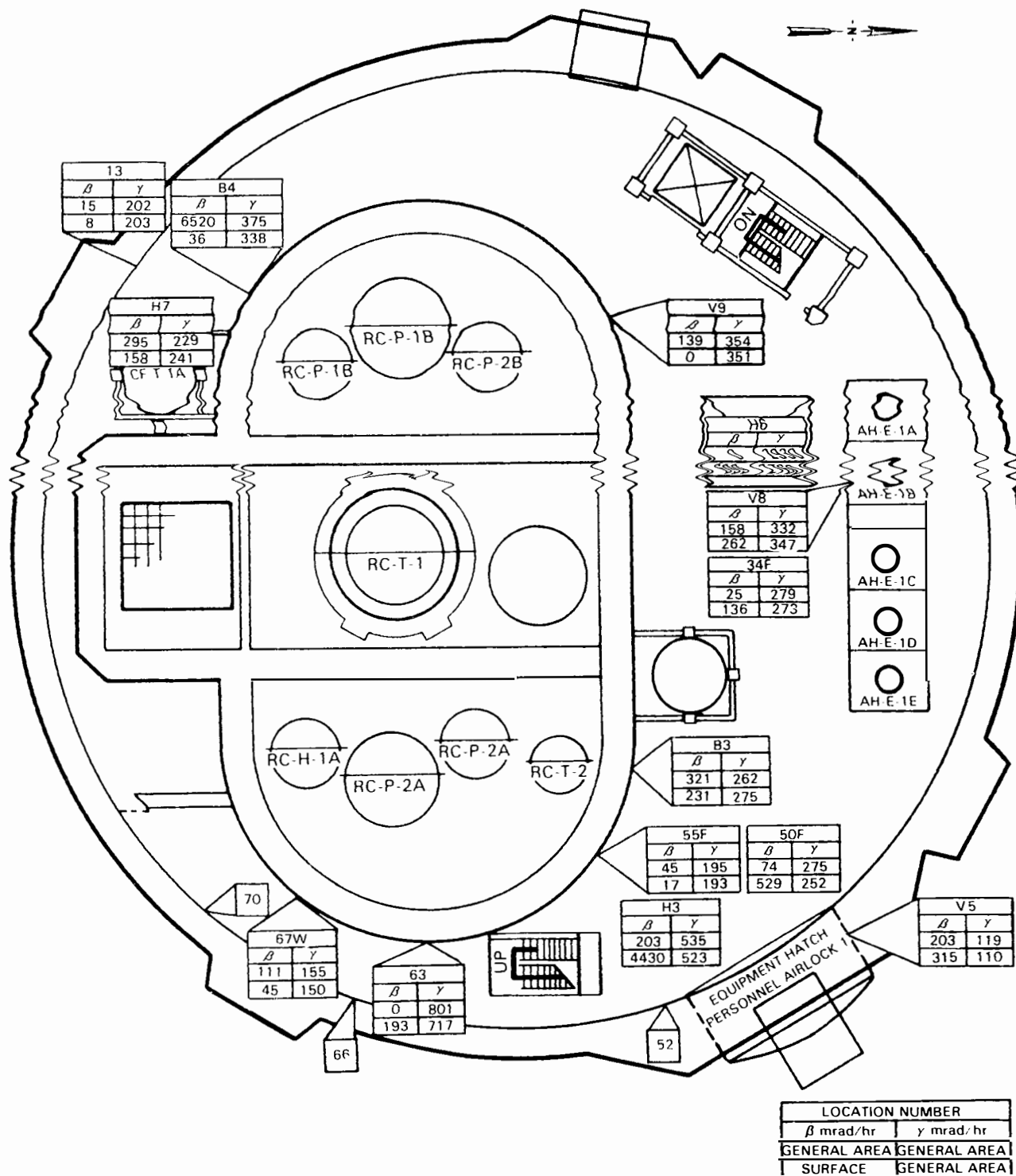


FIGURE 13a. Post Gross Decontamination Experiment Dosimeter Placement and Results - 305 Foot Elevation

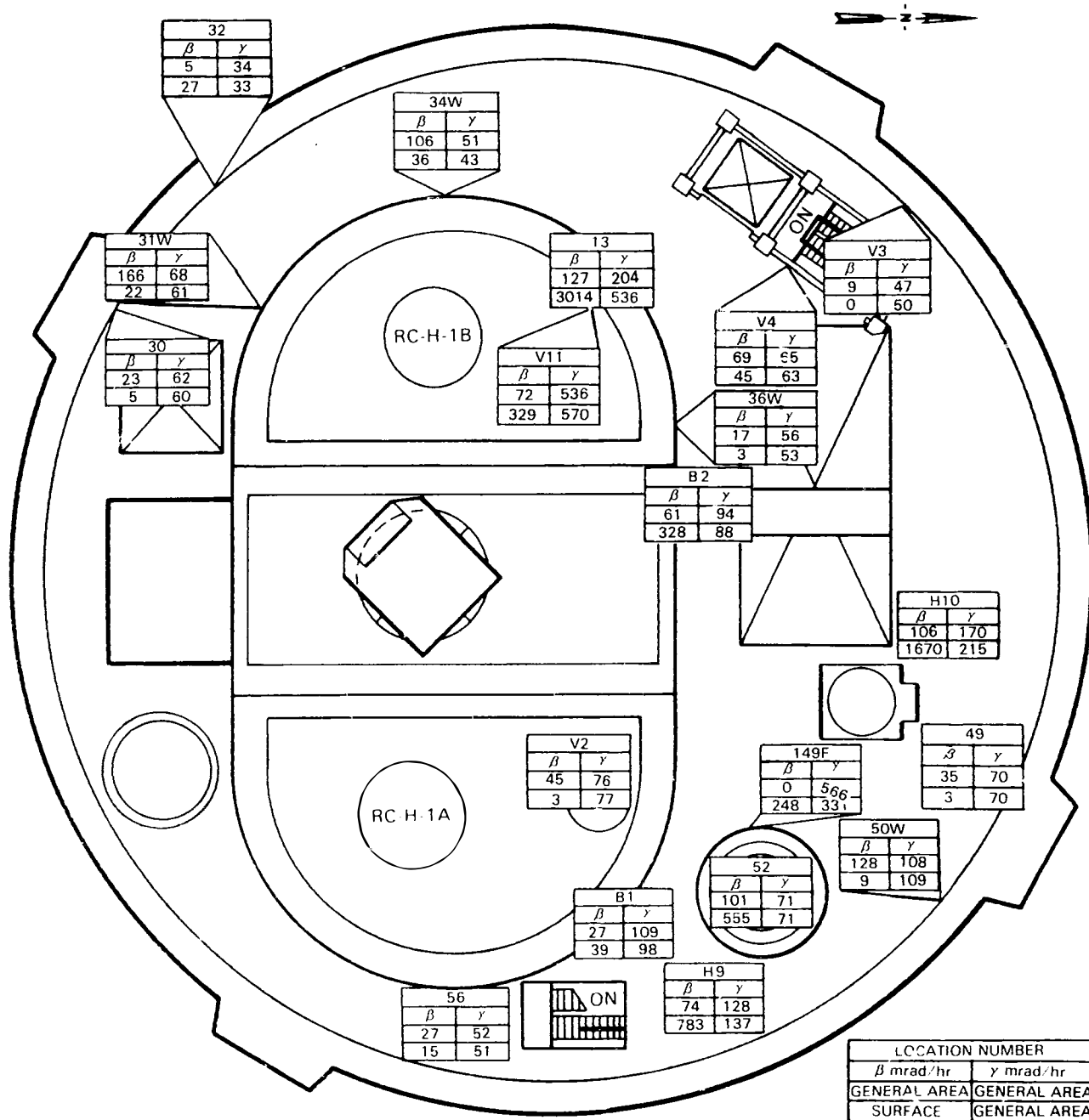


FIGURE 13b. Post Gross Decontamination Experiment Dosimeter Placement and Results - 347 and 367 Foot Elevations

TABLE 7a. Post Gross Decontamination Experiment Dosimeter Placement and Results -
305 Foot Elevation

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
1	13	Vertical surface, taped to liner ~4 feet above floor, NE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	15.2 ± 7.0	7.69 ± 5.46	202 ± 20	203 ± 19
2	H7	Horizontal surface, taped to floor, NE area of Rx Bldg., SE area under CF-T-1A	3/25/82 1500	4/22/82 1057	668	295 ± 192	158 ± 120	228 ± 23	241 ± 24
3	B4	Horizontal surface, placed on top of junction box, NE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	6520 ± 1340	35.6 ± 36.9	375 ± 35	338 ± 32
4	V9	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	139 ± 66	0	354 ± 35	351 ± 34
5	H6	Horizontal surface, taped to west area of hatch cover, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	0	699 ± 195	2930 ± 280	2760 ± 270
6	V8	Vertical surface, taped to front side of aircooler B ~4 feet above floor, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	158 ± 107	262 ± 235	332 ± 32	347 ± 32
58	34F	Horizontal surface, taped to floor, south area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	24.8 ± 37.7	136 ± 27	279 ± 27	273 ± 26
8	67W	Vertical surface, taped to D-ring wall ~4 feet above floor, NW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	111 ± 73	45.1 ± 31.1	155 ± 15	150 ± 15
61	63	Vertical surface, taped to D-ring wall ~4 feet above floor, W area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	0	193 ± 134	801 ± 77	717 ± 70
63	V5	Vertical surface, taped to south equipment hatch wall ~4 feet above floor	3/25/82 1500	4/22/82 1057	668	203 ± 22	315 ± 67	119 ± 12	110 ± 11
7	H3	Horizontal surface, taped to floor, West area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	230 ± 188	4430 ± 2090	535 ± 52	523 ± 54
64	SSP	Vertical surface, taped to D-ring wall ~4 feet above floor, SW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	45.0 ± 15.7	16.7 ± 28.3	195 ± 19	193 ± 20
65	B3	Vertical surface, taped to underside of junction box ~8 feet off floor	3/25/82 1500	4/22/82 1057	668	321 ± 33	231 ± 32	262 ± 27	275 ± 26
66	50F	Horizontal surface, taped to floor, SW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	73.7 ± 20.8	529 ± 67	275 ± 26	252 ± 24

TABLE 7b. Post Gross Decontamination Experiment Dosimeter Placement and Results -
347 and 367 Foot Elevations

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
13	30	Vertical surface, taped to liner 24 feet above floor by hatch cover, NE area Rx Bldg.	3/26/82	4/22/82	645.5	23.4 ± 7.2	5.37 ± 4.01	62.4 ± 6.1	59.8 ± 6.0
14	31W	Vertical surface, taped to D-ring wall 24 feet above floor, NE area Rx Bldg.	3/26/82	4/22/82	645.5	166 ± 14	22.3 ± 11.6	68.1 ± 6.6	61.3 ± 6.1
15	32	Vertical surface, taped to liner 24 feet above floor, NE area Rx Bldg.	3/26/82	4/22/82	645.5	5.28 ± 2.03	27.3 ± 6.5	34.1 ± 3.4	32.5 ± 3.1
18	34W	Vertical surface, taped to D-ring wall 24 feet above floor, East area Rx Bldg.	3/26/82	4/22/82	645.5	106 ± 12.3	35.8 ± 27.7	50.6 ± 4.8	43.0 ± 4.0
19	V3	Vertical surface, taped to liner behind enclosed stairwell 24 feet above floor	3/26/82	4/22/82	645.5	8.78 ± 1.58	0	47.1 ± 4.6	50.0 ± 4.7
67	V4	Vertical surface, taped to outside enclosed stairwell wall 24 feet above floor	3/26/82	4/22/82	645.5	69.2 ± 8.4	45.0 ± 9.7	65.5 ± 6.2	63.5 ± 6.1
12	36W	Vertical surface, taped to D-ring wall 24 feet above floor, SE area Rx Bldg.	3/26/82	4/22/82	645.5	17.2 ± 4.7	3.47 ± 2.49	56.5 ± 5.5	52.6 ± 5.1
68	B2	Horizontal surface, placed on top junction box, SE area Rx Bldg.	3/26/82	4/22/82	645.5	61.3 ± 13.7	328 ± 9.9	94.4 ± 8.8	88.3 ± 8.3
70	H10	Horizontal surface, taped to floor near SW corner of hatch cover, South area Rx Bldg.	3/26/82	4/22/82	645.5	106 ± 16	1670 ± 980	170 ± 16	215 ± 22
73	50W	Vertical surface, taped to East side of head stand, SW area Rx Bldg.	3/26/82	4/22/82	645.5	128 ± 21	9.01 ± 6.76	108 ± 10	109 ± 10
11	149F	Horizontal surface, taped to floor by D-ring wall, SW area Rx Bldg.	3/26/82	4/22/82	645.5	0	248 ± 199	566 ± 58	331 ± 33
74	52	Horizontal surface, taped to top of head stand, SW area Rx Bldg.	3/26/82	4/22/82	645.5	101 ± 12	555 ± 36	70.7 ± 6.9	70.6 ± 7.1
75	49	Vertical surface, taped to liner 24 feet above floor, SW area Rx Bldg.	3/26/82	4/22/82	645.5	34.8 ± 11.8	3.29 ± 6.76	69.8 ± 6.8	70.4 ± 6.9
76	V2	Vertical surface, taped to D-ring wall 24 feet above floor, West area Rx Bldg.	3/26/82	4/22/82	645.5	44.6 ± 7.0	3.17 ± 8.12	76.3 ± 7.1	77.3 ± 7.3
77	B1	Horizontal surface, placed on top of junction box, West area Rx Bldg.	3/26/82	4/22/82	645.5	26.6 ± 86	39.3 ± 5.1	109 ± 10	97.6 ± 9.3
78	H9	Horizontal surface, taped to floor 24 feet South of open stairwell, West area Rx Bldg.	3/26/82	4/22/82	645.5	74.4 ± 24.7	783 ± 119	128 ± 13	137 ± 13
80	56	Vertical surface, taped to liner 24 feet above floor, West area Rx Bldg.	3/26/82	4/22/82	645.5	26.5 ± 5.1	14.7 ± 4.4	52.0 ± 4.9	50.6 ± 4.9
71	13	Horizontal surface, 367 foot elevation, top D-ring wall, East area Rx Bldg.	3/26/82	4/22/82	645.5	129 ± 35	3020 ± 130	205 ± 20	232 ± 22
72	V11	Vertical surface, 367 foot elevation, taped to inside D-ring wall, East area Rx Bldg.	3/26/82	4/22/82	645.5	73.6 ± 26.3	331 ± 54	536 ± 50	571 ± 54

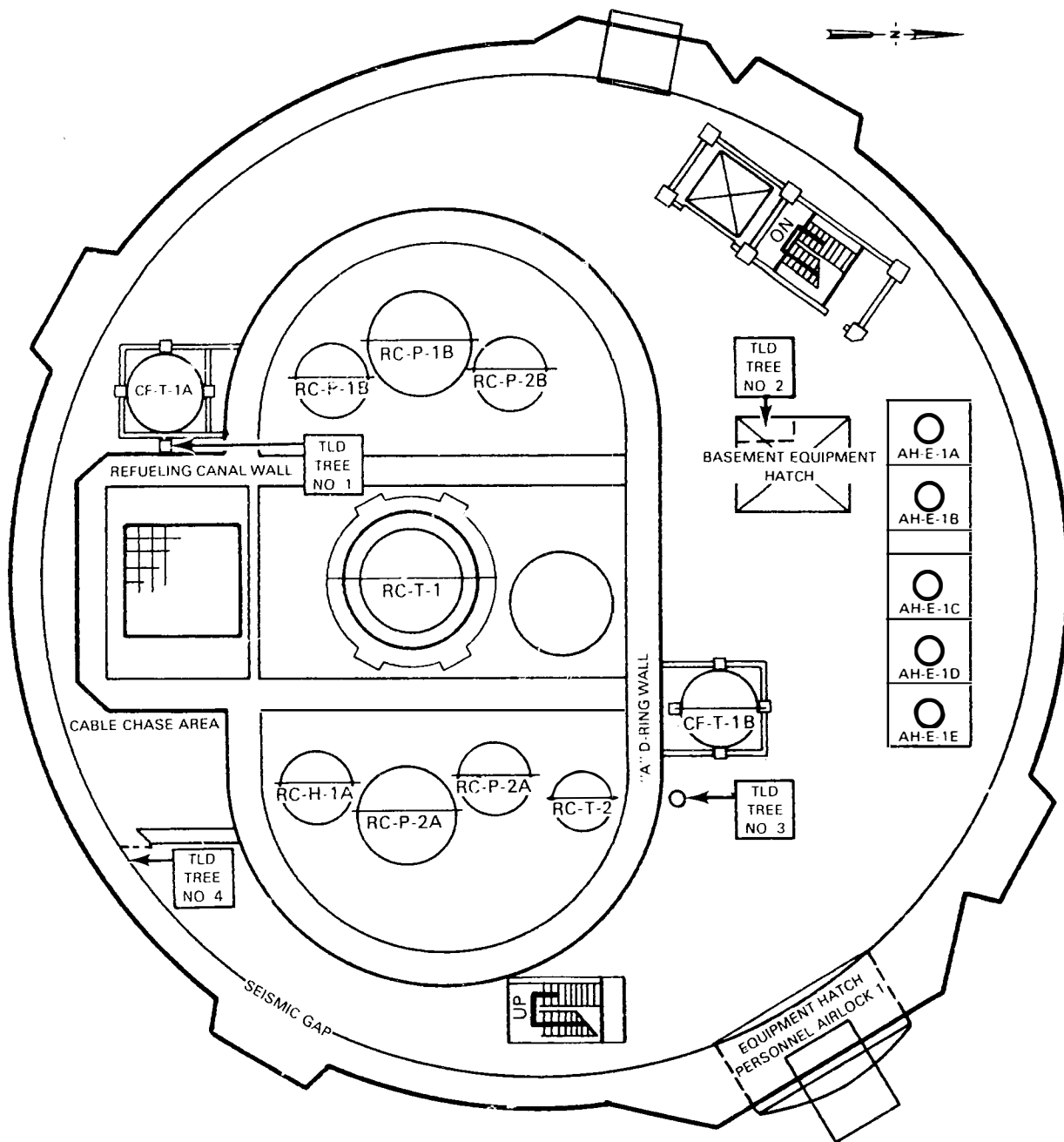


FIGURE 14. Preflushing of the Reactor Building Basement
TLD Tree Measurement Locations

TABLE 8. Placement of TLD Trees During Pre-Flushing of the Reactor Building Basement

Tree #	Location Description	Orientation of TLD Tree	Comments
1	TLD tree lowered through penetration 220, behind CF-T-1A and against the east wall of the refueling canal on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the east wall of the refueling canal.	There was no problem with the lowering or raising of the TLD tree.
2	TLD tree lowered through the NE section of the basement equipment hatch on the 305 foot elevation basement.	The front side of the TLD tree was facing toward personnel airlock #1.	There was no problem with the lowering or raising of the TLD tree.
3	TLD tree lowered through penetration R-37, west of CF-T-1B and against the "A" D-ring wall on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the "A" D-ring wall.	There was a slight problem with the lowering and raising of the TLD tree.
4	TLD tree lowered down the seismic gap by the cable chase area (NW area of Rx Bldg.) on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the containment liner.	There was no problem with the lowering or raising of the TLD tree.

TABLE 9. Pre-Flushing Experiment TLD Tree - Beta and Gamma Doses from Three Types of Dosimeters

TLD Tree #	TLD #	Elevation (ft)	Exposure Dates		Exposure (hrs)	PNL Dosimeter Dose Rates				Dose Rates			
			In Date & Time	Out Date & Time		Beta		Gamma		Panasonic		Harshaw	
						Front (rad/hr)	Back (rad/hr)	Front (rad/hr)	Back (rad/hr)	Beta (rad/hr)	Gamma (rad/hr)	Beta (rad/hr)	Gamma (rad/hr)
1	85	300	6/22/82 0945	6/22/82 1252	3.12	0.097± 0.142	0.0394 ± 0.563	1.10 ± 0.10	1.04 ± 0.10	0.449	1.058	0.208	0.801
	84	295	6/22/82 0945	6/22/82 1252	3.12	1.41 ± 0.68	3.65 ± 0.69	2.91 ± 0.31	2.93 ± 0.28	1.122	3.205	NA	3.462
	82	290	6/22/82 0945	6/22/82 1252	3.12	57.1 ± 7.7	34.6 ± 3.7	15.2 ± 1.7	14.2 ± 1.4	26.603	15.705	5.256	15.865
	81	285	6/22/82 0945	6/22/82 1252	3.12	57.2 ± 5.2	83.4 ± 4.0	16.2 ± 1.6	15.0 ± 1.7	48.077	16.987	12.885	23.750
2	89	300	6/22/82 1039	6/22/82 1259	2.33	1.27 ± 1.15	1.67 ± 1.18	9.32 ± 0.97	8.81 ± 0.86	1.159	10.730	NA	10.043
	88	295	6/22/82 1039	6/22/82 1259	2.33	6.54 ± 3.77	1.97 ± 2.1	22.0 ± 0.99	22.2 ± 2.1	12.446	24.464	NA	22.919
	87	290	6/22/82 1039	6/22/82 1259	2.33	11.6 ± 5.8	3.48 ± 1.95	46.7 ± 4.5	45.0 ± 4.3	22.318	41.202	NA	38.283
	86	285	6/22/82 1039	6/22/82 1259	2.33	70.2 ± 15.4	29.4 ± 8.0	65.3 ± 6.1	65.6 ± 6.5	NA	85.837	7.125	76.824
3	93	300	6/22/82 0949	6/22/82 1254	3.08	0.341± 0.321	0.637 ± 0.199	5.86 ± 0.62	5.40 ± 0.51	0.390	7.143	NA	6.818
	92	295	6/22/82 0949	6/22/82 1254	3.08	4.25 ± 0.69	3.22 ± 1.26	8.50 ± 0.82	7.99 ± 0.75	5.520	10.390	NA	11.721
	91	290	6/22/82 0949	6/22/82 1254	3.08	429 ± 8.5	22.5 ± 5.0	19.4 ± 1.9	17.9 ± 1.7	61.688	17.857	18.539	21.851
	90	285	6/22/82 0949	6/22/82 1254	3.08	22.3 ± 4.9	136 ± 21	13.3 ± 1.2	15.2 ± 1.5	64.935	18.831	6.201	15.877
4	97	300	6/22/82 0951	6/22/82 1256	3.08	0.249± 0.130	0	1.20 ± 0.11	1.24 ± 0.12	0.312	1.461	NA	1.299
	96	295	6/22/82 0951	6/22/82 1256	3.08	1.04 ± 0.25	1.58 ± 0.53	2.73 ± 0.26	2.74 ± 0.27	1.429	2.987	NA	3.052
	95	290	6/22/82 0951	6/22/82 1256	3.08	43.2 ± 2.0	33.7 ± 3.9	8.90 ± 0.85	7.85 ± 0.74	42.208	9.091	13.377	13.020
	94	285	6/22/82 0951	6/22/82 1256	3.08	99.0 ± 8.0	26.2 ± 5.3	18.1 ± 1.7	14.6 ± 1.5	56.442	18.182	33.766	21.948

CONCLUSIONS

The PNL multi-element beta dosimeter is a reliable device for determining doses in fields of mixed beta and gamma radiation. The studies that used these dosimeters illustrated the importance of using an energy-dependent calibration factor for beta dose determination: using a fixed calibration factor can result in a poor estimate of the dose. As illustrated by Figure 7, using only the calibration factor for betas from $^{90}\text{Sr}/^{90}\text{Y}$ can result in an underestimate of the dose as large as a factor of 5. The comparisons between the PNL dosimeter and dosimeters supplied by Vendor 2, the PNL dosimeters evaluated higher beta doses than those evaluated by the other dosimeters, indicating that the PNL dosimeters were operating as expected.

In Figure 6, a comparison between the PNL and Vendor 1 dosimeters, there is no well-defined trend as to which type determines a higher or lower dose. The PNL dosimeters measured higher doses than the Vendor 1 dosimeters in roughly half of the comparisons and lower doses in the other comparisons. This result is consistent with the fact that both PNL and Vendor 1 use energy-dependent calibration factors.

There is one important factor that could contribute to the discrepancy between the PNL, Vendor 2, and Vendor 1 dosimeters in dose evaluation--possible nonuniformities in the beta radiation field being measured. Since the range of betas in air is quite short compared to photons and neutrons, a variation in the concentration of beta emitters on a surface can lead to a similar variation in the intensity of the beta radiation striking nearby dosimeters. Thus two dosimeters placed several inches apart from each other against a contaminated wall could be exposed to different beta doses if the contamination on the wall were not uniform. It is quite likely that this effect occurred in some of the dosimeter comparisons.

The nonuniformity of beta radiation fields could also contribute to a poor dose determination by a multi-element dosimeter. The analysis of our dosimeter assumes that the entire dosimeter is exposed to a constant radiation field. There have been some instances in which it is obvious that some elements were exposed to higher dose rates than were other elements. There were dosimeters that showed higher TLD responses in elements that were covered by

thick shields than in the mylar-covered element, indicating a nonuniform field. The data analysis for such a dosimeter usually rejected the contribution of such an element, since the ratio to the mylar chip would be outside the allowed range, but this resulted in a loss of potential data. Smaller discrepancies could perhaps not be rejected, but instead would introduce some confusion into the data analysis. The error analysis routine was designed to catch such discrepancies and signal the possibility of a poor dose determination by indicating a large error. An example of an apparently nonuniform beta field can be seen in the results from dosimeter #3, back, in the post-gross decontamination experiment. For this dosimeter, elements 4, 5, and 6 had higher TLD responses than element 1. The evaluated error for this beta dose was larger than the evaluated dose itself.

Another possible error occurs when a significant amount of low energy x-rays are present. The relationship between TLD response and absorber thickness is flat for photons with energies greater than about 40 keV, so that the response of these photons would be correctly subtracted from the element responses to give the beta response. Photons with low energies, however, are weak penetrators of aluminum, and Figures 4 and 5 show that the relative responses of the elements are similar for betas and low-energy x-rays. The presence of these low energy x-rays would therefore be an interference in the dosimeter's dose evaluation. Preliminary studies of radionuclides in the TMI-2 containment building have indicated that three radionuclides, ^{134}Cs , ^{137}Cs and ^{90}Sr (and their radioactive progeny), are responsible for producing most of the dose observed in the building (NRC 1981). During the radioactive decay of these nuclides, the radiation emitted consists almost exclusively of betas and gammas; x rays with energies less than 40 keV make a negligible contribution to the dose (Kocher 1981). Thus, the presence of low energy x-rays did not appear to be a serious problem in the TMI-2 dosimeter exposures.

The presence of a very high-intensity gamma field in along with the betas could be an interference due to poor counting statistics. Since the data analysis depends on subtracting the gamma contribution to the TLD response of each element, a small beta response in the presence of a high gamma response would result in a high error for the beta response. Gamma intensities during the TMI-2 exposures never seemed to be high enough to cause such interference.

Since betas are attenuated by relatively thin absorbers, any material placed between the aluminum shields and the source of betas will attenuate the beta radiation. For use in a contaminated environment such as the TMI-2 containment building, it is necessary to enclose the dosimeters in a plastic bag to avoid contamination of the dosimeter itself. This plastic packaging acts as an additional absorber over the dosimeter. The plastic has the effect of stopping some very low energy betas that otherwise would have produced a response in the dosimeter, and generally reducing the number of betas of all energies that strike the dosimeter. The dosimeter that is packaged in plastic therefore records a beta dose that is a bit lower than the dose that would have been recorded by an unpackaged dosimeter.

None of the uncertainties identified in this discussion are seen as seriously affecting the use of the multi-element beta dosimeters. Although the dosimeters are still under development, especially in developing improved algorithms for dose analyses, the dosimeter is an important tool for reliably estimating beta and gamma doses.

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APPENDIX I

SOURCE CODE LISTING FOR RAT107

APPENDIX I

SOURCE CODE LISTING FOR RATIO7

```

0001 C
0002 C This Program Analyzes Multi-element Beta Dosimeters
0003 C It is designed to handle either 4-element or 7-element
0004 C dosimeters, with 3 TLD's in each element
0005 C
0006 C Written by R I S 7/82
0007 C Altered 1/83
0008 C
0009 CHARACTER*1 ANS, BACK/'B'/, STAR(200,7,3)/4200*' /
0010 CHARACTER*3 OLDNEW, OLD/'OLD'/
0011 CHARACTER*5 FRNTBK(2)/'FRONT', 'BACK' /
0012 CHARACTER*8 HDG(7)/'MYLAR #1', '005" #2', '010" #3', '020" #4',
0013 '032" #5', '064" #6', '125" #7'/
0014 CHARACTER*24 FLNM
0015 CHARACTER*80 TITLE
0016 DIMENSION RAW(200,7,3), AVE(200,7), IPCT(200,7), RATIO(200,6),
0017 1 CAL(200,6), DOSE(200), ID(200), IFB(200), COEF(6), YINT(6),
0018 2 RATIO MAX(6), RATIO MIN(6), BETA(200,6), GAMMA(200), GAMDOS(200),
0019 3 ERBDOS(200), ERGDOS(200), HR(200)
0020 DATA CAL/1200*0./, RATIO/1200*0 /
0021 DATA HR/200*2 /
0022 C
0023 C OPEN FILES
0024 C
0025 WRITE(6,10)
0026 10 FORMAT(/' Enter filename for input data: ', $)
0027 READ(5,20) FLNM
0028 20 FORMAT(A24)
0029 OPEN(UNIT=10, FILE=FLNM, STATUS='OLD', READONLY)
0030 OPEN(UNIT=15, FILE='RATIOOUT.DAT', STATUS='NEW',
0031 1 DISPOSE='PRINT/DELETE')
0032 C
0033 C PRESET VALUES
0034 C
0035 COEF(2)=-1.0032
0036 COEF(3)=-1.0960
0037 COEF(4)=-.7438
0038 COEF(5)=-1.1142
0039 COEF(6)=-6.1597
0040 YINT(2)=.9943
0041 YINT(3)=.9471
0042 YINT(4)=.6028
0043 YINT(5)=.5885
0044 YINT(6)=.6215
0045 RATIO MAX(2)=.7800
0046 RATIO MAX(3)=.6641
0047 RATIO MAX(4)=.5174
0048 RATIO MAX(5)=.3325
0049 RATIO MAX(6)=.0655
0050 RATIO MIN(2)=0.
0051 RATIO MIN(3)=0.
0052 RATIO MIN(4)=.2996
0053 RATIO MIN(5)=.1871
0054 RATIO MIN(6)=.0392
0055 CAL MAX=.218
0056 GCDEF=.2037
0057 DESCR=5

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0058         IDSCR=IINT(DESCR)
0059 C
0060 C INPUT
0061 C
0062         WRITE(6,100)
0063 100     FORMAT('/ Input')
0064         READ(10,110)TITLE
0065 110     FORMAT(A80)
0066         DO 160 I=1,200
0067         READ(10,*)ID(I)
0068             IF(ID(I).LE.0)GOTO 170
0069         READ(10,130)ANS
0070 130     FORMAT(A1)
0071         PRINT*, ID(I),ANS
0072         IFB(I)=1
0073         IF(ANS.EQ.BACK)IFB(I)=2
0074         READ(10,*)HR(I)
0075         DO 145 IC=1,7
0076 145     READ(10,*)(RAW(I,IC,J),J=1,3)
0077 160     CONTINUE
0078         ND=200
0079         WRITE(6,165)
0080 165     FORMAT('/ *** LIMIT OF 200 DOSIMETERS -- ANALYSIS PROCEEDS ***')
0081 170     READ(10,171,END=174)OLDNEW
0082 171     FORMAT(A3)
0083         IF(OLDNEW.NE.OLD)GOTO 174
0084 C
0085 C Use old Calibration Factors (Dosimeters read out before 3/82)
0086 C
0087         COEF(4)=-1.5103
0088         COEF(5)=-2.3398
0089         YINT(4)=.9901
0090         YINT(5)=.9901
0091         CALMAX=.3511
0092         RATIO MAX(4)=0.4231
0093         RATIO MAX(5)=0.2731
0094         GCDEF=.2394
0095 174     CONTINUE
0096 C
0097 C PROCESS RAW COUNTS
0098 C
0099         WRITE(6,175)
0100 175     FORMAT('/ OFF AND RUNNING... ',/)
0101         IF(ND.NE.200)ND=I-1
0102         DO 200 I=1,ND
0103             WRITE(6,177)ID(I),FRNTBK(IFB(I))
0104 177     FORMAT(I8,1X,A5)
0105         DO 184 IC=1,7
0106         AVE(I,IC)=0.
0107         SUMX2=0.
0108         SUMX=0.
0109         DO 179 J=1,3
0110         AVE(I,IC)=AVE(I,IC)+RAW(I,IC,J)
0111         SUMX=SUMX+RAW(I,IC,J)
0112 179     SUMX2=SUMX2+RAW(I,IC,J)*RAW(I,IC,J)
0113         AVE(I,IC)=AVE(I,IC)/3.
0114         SD=0.
0115         IF(SUMX2-SUMX*SUMX/3..GT.0.)
0116             1 SD=SQRT((SUMX2-SUMX*SUMX/3.)/2.)
0117         IF(AVE(I,IC).GT.0.)SD=SD/AVE(I,IC)
0118 180     PCT=SD*100.
0119 C
0120 C Test for fliers in the TLD data
0121 C

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0122          IF(PCT LE. DESCR) GOTO 183
0123          C12=100 *ABS(RAW(I, IC, 1)-RAW(I, IC, 2))/RAW(I, IC, 2)
0124          C23=100 *ABS(RAW(I, IC, 2)-RAW(I, IC, 3))/RAW(I, IC, 3)
0125          C31=100 *ABS(RAW(I, IC, 3)-RAW(I, IC, 1))/RAW(I, IC, 1)
0126          NLO=0
0127          IF(C12 LT. DESCR)NLO=NLO+1
0128          IF(C23 LT. DESCR)NLO=NLO+1
0129          IF(C31 LT. DESCR)NLO=NLO+1
0130          IF(NLO GE. 2)GOTO 183
0131          IF(NLO EQ. 1)GOTO 1830
0132      C -- accept AVE as is for thin elements & elt 7
0133          IF(IC LT. 4 OR IC EQ. 7)GOTO 183
0134      C -- if % > DESCR+3, reject element data for elt. 4-6
0135          IF(PCT LT. DESCR+3.) GOTO 183
0136          AVE(I, IC)=0.
0137          DO 1820 J=1, 3
0138      1820      STAR(I, IC, J)='*'
0139          GOTO 183
0140      C -- one TLD is a flier
0141      1830      IF(C12 LT. DESCR)ISTAR=3
0142          IF(C23 LT. DESCR)ISTAR=1
0143          IF(C31 LT. DESCR)ISTAR=2
0144          STAR(I, IC, ISTAR)='*'
0145          AVE(I, IC)=(3. *AVE(I, IC)-RAW(I, IC, ISTAR))/2
0146          KK=1
0147          IF( ISTAR EQ. 1) KK=2
0148          PCT=100 *SQRT(2.)*ABS(RAW(I, IC, KK)-AVE(I, IC))/AVE(I, IC)
0149      183      IF(IC EQ. 1)SD2CTS=(PCT/100. *AVE(I, 1))**2
0150          IF(IC EQ. 7)SD2CTS=SD2CTS+(PCT/100. *AVE(I, 7))**2
0151          IF(IC EQ. 7)ERGDOS(I)=SQRT(.093* .093 + PCT/100. *PCT/100.)
0152          IPCT(I, IC)=INT( 5+PCT)
0153      C
0154      C Subtract off Gamma Component of TLD responses
0155      C
0156      184      CONTINUE
0157          DO 185 IC=1, 6
0158          BETA(I, IC)=AVE(I, IC)-AVE(I, 7)
0159      185      IF(BETA(I, IC).LT. 0.)BETA(I, IC)=0.
0160          GAMMA(I)=AVE(I, 7)
0161      C
0162      C Determine Calibration Factors
0163      C
0164
0165          IF(BETA(I, 1).LE. 0.) GOTO 189
0166          DO 188 J=2, 6
0167      188      RATIO(I, J)=BETA(I, J)/BETA(I, 1)
0168      189      IF(AVE(I, 2).GT. 0. OR AVE(I, 3).GT. 0. OR AVE(I, 6)
0169          1 .GT. 0.) GOTO 190
0170      C -- 4-Element Dosimeter
0171          DO 1892 J=4, 5
0172          CAL(I, J)=RATIO(I, J)*COEF(J)+YINT(J)
0173      1892      IF(RATIO(I, J) .GT. RATIOMAX(J)) CAL(I, J)=CALMAX
0174          CAL(I, 1)=(CAL(I, 4)+CAL(I, 5))/2.
0175          SD2CF=2. *(CAL(I, 4)-CAL(I, 1))**2
0176          GOTO 1995
0177      C -- 7-Element Dosimeter
0178      190      ICAL=0.
0179          SUMCF=0.
0180          SUMCF2=0.
0181          DO 199 J=2, 6
0182          IF(RATIO(I, J) .LT. RATIOMAX(J)) GOTO 192
0183          CAL(I, J)=CALMAX
0184          ICAL=ICAL+1
0185          GOTO 195

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0186      192      IF(RATIO(I,J) .LT. RATIOMIN(J)) GOTO 199
0187      CAL(I,J) = RATIO(I,J)*COEF(J) + YINT(J)
0188      ICAL=ICAL+1
0189      195      CAL(I,1) = CAL(I,1) + CAL(I,J)
0190      SUMCF=SUMCF+CAL(I,J)
0191      SUMCF2=SUMCF2+CAL(I,J)*CAL(I,J)
0192      199      CONTINUE
0193      CAL(I,1) = CAL(I,1)/ICAL
0194      SD2CF=(SUMCF2-SUMCF*SUMCF/ICAL)/(ICAL-1)
0195      C
0196      C   Calculate Doses
0197      C
0198      1995      GAMDOS(I)=GAMMA(I)*GCOEF
0199      ERGDOS(I)=ERGDOS(I)*GAMDOS(I)
0200      DOSE(I)=CAL(I,1)*BETA(I,1)
0201      ERBDOS(I)=0.
0202      IF(DOSE(I) .EQ. 0.)GOTO 200
0203      ERBDOS(I)=SQRT(SD2CF/CAL(I,1)/CAL(I,1) + SD2CTS/
0204      1 BETA(I,1)/BETA(I,1))*DOSE(I)
0205      200      CONTINUE
0206      C
0207      C   OUTPUT RAW DATA
0208      C
0209      WRITE(6,205)
0210      205      FORMAT(/' Creating output')
0211      WRITE(15,210)TITLE,HDG
0212      210      FORMAT(1H1,A80, //55X, 'SUMMARY OF DOSIMETER READINGS',
0213      1 //6X, 'Dosimeter', 7(7X,A8), /13X, 7(11X, '(nc)'))
0214      IL=0
0215      DO 250 I=1,ND
0216      IL=IL+1
0217      IF(IL.LT.7)GOTO 215
0218      WRITE(15,212)
0219      212      FORMAT(/10X, '( * indicates a rejected flier )')
0220      WRITE(15,210)TITLE,HDG
0221      IL=1
0222      215      WRITE(15,220)ID(I),FRNTBK(IFB(I)),(RAW(I,IC,1),STAR(I,IC,1),
0223      1 IC=1,7)
0224      220      FORMAT(/3X, I6,1X,A5, ' Raw',F8.2,A1,6(F14.2,A1))
0225      DO 225 J=2,3
0226      225      WRITE(15,230)(RAW(I,IC,J),STAR(I,IC,J),IC=1,7)
0227      230      FORMAT(17X, 'Raw',F8.2,A1,6(F14.2,A1))
0228      WRITE(15,240)(AVE(I,IC),IPCT(I,IC),IC=1,7),
0229      +(BETA(I,IC),IC=1,6),(RATIO(I,IC),IC=2,6)
0230      240      FORMAT(/17X, 'Ave',F8.2, '+/-', I2, '%', 6(F9.2, '+/-', I2, '%'),
0231      +/16X, 'Beta',F8.2, 5F15.2, 11X, '0.00', /16X, 'Ratio', 3X, '1.00', 5F15.4)
0232      250      CONTINUE
0233      WRITE(15,212)
0234      C
0235      C   OUTPUT RESULTS
0236      C
0237      WRITE(15,255)TITLE
0238      255      FORMAT(1H1,A80, //28X, '*** RESULTS ***', 45X, 'CALCULATED DOSES',
0239      1 //1X, 'Dosimeter', 19X, 'Calibration Factors', 23X, 'Mylar Chip',
0240      2 5X, 'Calculated Beta', 7X, 'Calculated Gamma',
0241      3 /12X, '.005"', 5X, '.010"', 5X, '.020"', 5X, '.032"', 5X, '.064"',
0242      4 7X, 'Ave.', 6X, 'Reading', 8X, 2('Dose Error', 9X),
0243      5 /9X, 6(2X, '(rad/nc)'), 7X, '(nc)', 2(8X, '(rad) (rad)'))
0244      IL=0
0245      DO 280 I=1,ND,2
0246      IL=IL+1
0247      IF(IL.LT.17)GOTO 259
0248      WRITE(15,255)TITLE
0249      IL=0

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0250      258      WRITE(15,259)
0251      259      FORMAT(1X)
0252      WRITE(15,260)ID(I),FRNTBK(IFB(I)),(CAL(I,J),J=2,6),CAL(I,1),
0253      +BETA(I,1),DOSE(I),ERBDOS(I),GAMDOS(I),ERGDOS(I)
0254      260      FORMAT(I4,1X,A5,F7.2,5F10.2,F13.2,2(F13.2,F9.2))
0255      IP=I+1
0256      WRITE(15,260)ID(IP),FRNTBK(IFB(IP)),(CAL(IP,J),J=2,6),
0257      +CAL(IP,1),BETA(IP,1),DOSE(IP),ERBDOS(IP),GAMDOS(IP),ERGDOS(IP)
0258      280      CONTINUE
0259      C
0260      C   Output Summary Page of Doses, Dose Rates
0261      C
0262      WRITE(15,300)TITLE
0263      300      FORMAT(1H1,A80,/,28X,'*** SUMMARY OF DOSES AND DOSE RATES ***',
0264      1 //1X,'Dosimeter',5X,'Beta',6X,'Gamma',3X,'Exposure',3X,
0265      2 'Beta Dose Rate',5X,'Gamma Dose Rate',/9X,2(6X,'Dose'),7X,
0266      3 'Time',2(15X,'Error'),/10X,2(5X,'(rad)'),6X,'(hr)',1X,
0267      4 2(3X,'(rad/hr) (rad/hr)'))
0268      IL=0
0269      DO 350 I=1,ND,2
0270      IL=IL+1
0271      IF(IL.LT.17)GOTO 310
0272      WRITE(15,300)TITLE
0273      IL=0
0274      310      BETADR=DOSE(I)/HR(I)
0275      GAMMADR=GAMDOS(I)/HR(I)
0276      ERBDR=ERBDOS(I)/HR(I)
0277      ERGDR=ERGDOS(I)/HR(I)
0278      WRITE(15,259)
0279      WRITE(15,320)ID(I),FRNTBK(IFB(I)),DOSE(I),GAMDOS(I),HR(I),BETADR,
0280      1 ERBDR,GAMMADR,ERGDR
0281      320      FORMAT(I3,1X,A5,1X,2F10.2,F10.1,1PE11.2E2,E9.2E2,2X,2E9.2E2)
0282      IP=I+1
0283      BETADR=DOSE(IP)/HR(IP)
0284      GAMMADR=GAMDOS(IP)/HR(IP)
0285      ERBDR=ERBDOS(IP)/HR(IP)
0286      ERGDR=ERGDOS(IP)/HR(IP)
0287      WRITE(15,320)ID(IP),FRNTBK(IFB(IP)),DOSE(IP),GAMDOS(IP),HR(IP),
0288      1 BETADR,ERBDR,GAMMADR,ERGDR
0289      350      CONTINUE
0290      C
0291      C   Final Comments
0292      C
0293
0294      WRITE(6,400)
0295      400      FORMAT(/,5X,'END OF RUN',/)
0296      CLOSE(UNIT=10)
0297      CLOSE(UNIT=15,DISPOSE='PRINT/DELETE')
0298      STOP
0299      END

```

APPENDIX II

OUTPUT LISTINGS FOR RATIO7 RUNS

VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS
VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS
VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS

```

SSSS  CCCC  H  H  EEEEF
S      C      H  H  E
S      C      H  H  E
SSS    C      HHHH  EEEE
      S  C      H  H  E
      S  C      H  H  E
SSSS  CCCC  H  H  EEEEE

```

```

RRRRRRRR  AAAAAA  TTTTTTTTTT  IIIIII  000000  000000  UU  UU  TTTTTTTTTT
RRRRRRRR  AAAAAA  TTTTTTTTTT  IIIIII  000000  000000  UU  UU  TTTTTTTTTT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RRRRRRRR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RRRRRRRR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AAAAAAAAAA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AAAAAAAAAA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  IIIIII  000000  000000  UUUUUUUUUU  TT
RR  RR  AA  AA  TT  IIIIII  000000  000000  UUUUUUUUUU  TT

```

```

DDDDDDDD  AAAAAA  TTTTTTTTTT  IIII  11
DDDDDDDD  AAAAAA  TTTTTTTTTT  IIII  11
DD  DD  AA  AA  TT  IIII  1111
DD  DD  AA  AA  TT  IIII  1111
DD  DD  AA  AA  TT  IIII  11
DD  DD  AA  AA  TT  IIII  11
DD  DD  AA  AA  TT  IIII  11
DD  DD  AAAAAAAAAA  TT  IIII  11
DD  DD  AAAAAAAAAA  TT  IIII  11
DD  DD  AA  AA  TT  IIII  11
DD  DD  AA  AA  TT  IIII  11
DDDDDDDD  AA  AA  TT  IIII  111111
DDDDDDDD  AA  AA  TT  IIII  111111

```

```

SSSS  CCCC  H  H  EEEEE
S      C      H  H  E
S      C      H  H  E
SSS    C      HHHH  EEEE
      S  C      H  H  E
      S  C      H  H  E
SSSS  CCCC  H  H  EEEEE

```

VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS
VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS
VAX/VMS	SCHE	RATIOOUT	13-JUN-1983	13:38	TTA4:	13-JUN-1983	13:38	DISK\$USER_DISK1	[(SCHE BETDOS)RATIOOUT.DAT;1	VAX/VMS

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
1 FRONT	Raw 74 56	0 00	0 00	66 25	57 20	0 00	59 20
	Raw 70 97	0 00	0 00	64 78	59 56	0 00	58 98
	Raw 75 20	0 00	0 00	61 02	59 64	0 00	58 10
	Ave 73 58+/- 3%	0 00+/- 0%	0 00+/- 0%	64 02+/- 4%	58 80+/- 2%	0 00+/- 0%	58 76+/- 1%
	Beta 14 82	0 00	0 00	5 26	0 04	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 3548	0 0027	0 0000	
1 BACK	Raw 154 30	0 00	0 00	67 88	69 05	0 00	95 06
	Raw 119 80	0 00	0 00	67 61	63 82	0 00	80 58
	Raw 86 14	0 00	0 00	68 38	68 21	0 00	70 47
	Ave 120 08+/-28%	0 00+/- 0%	0 00+/- 0%	67 96+/- 1%	67 03+/- 4%	0 00+/- 0%	82 04+/-15%
	Beta 38 04	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
2 FRONT	Raw 734 00	0 00	0 00	623 80	686 80	0 00	671 60
	Raw 690 40	0 00	0 00	645 50	677 70	0 00	658 80
	Raw 713 50	0 00	0 00	620 80	667 30	0 00	662 20
	Ave 712 63+/- 3%	0 00+/- 0%	0 00+/- 0%	630 03+/- 2%	677 27+/- 1%	0 00+/- 0%	664 20+/- 1%
	Beta 48 43	0 00	0 00	0 00	13 07	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 2698	0 0000	
2 BACK	Raw 1372 00	0 00	0 00	804 30*	741 50	0 00	734 80
	Raw 1477 00	0 00	0 00	886 00	766 00	0 00	718 20
	Raw 1466 00	0 00	0 00	918 40	800 50	0 00	733 40
	Ave 1438 33+/- 4%	0 00+/- 0%	0 00+/- 0%	902 20+/- 3%	769 33+/- 4%	0 00+/- 0%	728 80+/- 1%
	Beta 709 53	0 00	0 00	173 40	40 53	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2444	0 0571	0 0000	
3 FRONT	Raw 483 10	0 00	0 00	227 50	204 10	0 00	188 10
	Raw 493 50	0 00	0 00	242 80	207 10	0 00	193 60
	Raw 484 80	0 00	0 00	229 40	212 90	0 00	180 60
	Ave 487 13+/- 1%	0 00+/- 0%	0 00+/- 0%	233 23+/- 4%	208 03+/- 2%	0 00+/- 0%	187 43+/- 3%
	Beta 299 70	0 00	0 00	45 80	20 60	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1528	0 0607	0 0000	
3 BACK	Raw 197 30	0 00	0 00	171 50	203 90	0 00	198 00
	Raw 189 50	0 00	0 00	182 00	201 90	0 00	201 90
	Raw 193 50	0 00	0 00	180 80	198 70	0 00	201 40
	Ave 193 43+/- 2%	0 00+/- 0%	0 00+/- 0%	178 10+/- 3%	201 50+/- 1%	0 00+/- 0%	200 43+/- 1%
	Beta 0 00	0 00	0 00	0 00	1 07	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	

(* indicates a rejected filer)

Pre-Gross Decontamination Experiment, exposed 12/81 (ILD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
4 FRONT	Raw 567 20	0 00	0 00	171 50	153 90	0 00	138 30
	Raw 592 10	0 00	0 00	168 20	140 10	0 00	138 90
	Raw 627 00*	0 00	0 00	171 00	144 60	0 00	132 40
	Ave 579 65+/- 3%	0 00+/- 0%	0 00+/- 0%	170 23+/- 1%	146 20+/- 5%	0 00+/- 0%	136 53+/- 3%
	Beta 443 12	0 00	0 00	33 70	9 67	0 00	0 00
4 BACK	Raw 150 20	0 00	0 00	153 40	166 20	0 00	163 80
	Raw 163 40	0 00	0 00	147 70	156 40	0 00	172 00
	Raw 164 50	0 00	0 00	149 50	163 80	0 00	162 20
	Ave 159 37+/- 5%	0 00+/- 0%	0 00+/- 0%	150 20+/- 2%	162 13+/- 3%	0 00+/- 0%	166 00+/- 3%
	Beta 0 00	0 00	0 00	0 00	0 00	0 00	0 00
5 FRONT	Raw 397 00	0 00	0 00	191 50	164 30	0 00	169 40
	Raw 352 50	0 00	0 00	177 70	172 50	0 00	164 30
	Raw 236 70	0 00	0 00	174 50	164 40	0 00	163 20
	Ave 328 73+/- 25%	0 00+/- 0%	0 00+/- 0%	181 23+/- 5%	167 07+/- 3%	0 00+/- 0%	166 30+/- 2%
	Beta 162 43	0 00	0 00	14 93	0 77	0 00	0 00
5 BACK	Raw 200 20	0 00	0 00	180 30	181 00	0 00	180 50
	Raw 193 00	0 00	0 00	179 00	184 40	0 00	191 10
	Raw 196 10	0 00	0 00	176 70	180 30	0 00	188 90
	Ave 196 43+/- 2%	0 00+/- 0%	0 00+/- 0%	178 93+/- 1%	181 90+/- 1%	0 00+/- 0%	186 83+/- 3%
	Beta 9 60	0 00	0 00	0 00	0 00	0 00	0 00
6 FRONT	Raw 571 80	0 00	0 00	472 30	445 50	0 00	450 50
	Raw 557 10	0 00	0 00	470 50	460 20	0 00	478 30
	Raw 590 40	0 00	0 00	491 60	458 00	0 00	482 30
	Ave 573 10+/- 3%	0 00+/- 0%	0 00+/- 0%	478 13+/- 2%	454 57+/- 2%	0 00+/- 0%	470 37+/- 4%
	Beta 102 73	0 00	0 00	7 77	0 00	0 00	0 00
6 BACK	Raw 1709 00	0 00	0 00	582 90	562 20	0 00	500 10
	Raw 1740 00	0 00	0 00	636 10	588 10	0 00	555 70*
	Raw 1762 00	0 00	0 00	617 30	569 00	0 00	503 40
	Ave 1737 00+/- 2%	0 00+/- 0%	0 00+/- 0%	612 10+/- 4%	573 10+/- 2%	0 00+/- 0%	501 75+/- 0%
	Beta 1235 25	0 00	0 00	110 35	71 35	0 00	0 00

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
7 FRONT	Raw 542 20	0 00	0 00	451 00	481 60	0 00	458 20
	Raw 481 70*	0 00	0 00	464 30	464 60	0 00	490 40
	Raw 525 70	0 00	0 00	445 80	469 80	0 00	486 20
	Ave 533.95+/- 2%	0.00+/- 0%	0.00+/- 0%	453.70+/- 2%	472.00+/- 2%	0.00+/- 0%	478.27+/- 4%
	Beta 55 68	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
7 BACK	Raw 1668 00*	0 00	0 00	634 70	543 00	0 00	523 60
	Raw 1503 00	0 00	0 00	611 00	582 60	0 00	504 80
	Raw 1570 00	0 00	0 00	635 50	533 10	0 00	517 60
	Ave 1536.50+/- 3%	0.00+/- 0%	0.00+/- 0%	627.07+/- 2%	552.90+/- 5%	0.00+/- 0%	515.33+/- 2%
	Beta 1021 17	0 00	0 00	111 73	37 57	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1094	0 0368	0 0000	0 0000
8 FRONT	Raw 496 10	0 00	0 00	472 60	451 60	0 00	454 40
	Raw 500 20	0 00	0 00	452 40	480 40	0 00	461 30
	Raw 509 10	0 00	0 00	475 50	450 90	0 00	453 40
	Ave 501.80+/- 1%	0.00+/- 0%	0.00+/- 0%	466.83+/- 3%	460.97+/- 4%	0.00+/- 0%	456.37+/- 1%
	Beta 45 43	0 00	0 00	10 47	4 60	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2304	0 1012	0 0000	0 0000
8 BACK	Raw 2084 00*	0 00	0 00	616 30	604 30	0 00	536 90
	Raw 1830 00	0 00	0 00	574 60	604 30	0 00	524 20
	Raw 1895 00	0 00	0 00	625 80	649 80	0 00	525 10
	Ave 1862.50+/- 2%	0.00+/- 0%	0.00+/- 0%	605.57+/- 4%	619.47+/- 4%	0.00+/- 0%	528.73+/- 1%
	Beta 1333 77	0 00	0 00	76 83	90 73	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0576	0 0680	0 0000	0 0000
9 FRONT	Raw 836 90	0 00	0 00	883 80	807 00	0 00	714.40*
	Raw 844 50	0 00	0 00	855 20	833 70	0 00	782 20
	Raw 875 80	0 00	0 00	842 00	881 30	0 00	807 90
	Ave 852.40+/- 2%	0.00+/- 0%	0.00+/- 0%	860.33+/- 2%	840.67+/- 4%	0.00+/- 0%	795.05+/- 2%
	Beta 57 35	0 00	0 00	65 28	45 62	0 00	0 00
	Ratio 1 00	0 0000	0 0000	1 1383	0 7954	0 0000	0 0000
9 BACK	Raw 3888 00	0 00	0 00	929 80	933 60	0 00	920 20
	Raw 3560 00	0 00	0 00	980 90	904 40	0 00	940 00
	Raw 5626 00	0 00	0 00	997 60	921 70	0 00	951 50
	Ave 4358.00+/-25%	0.00+/- 0%	0.00+/- 0%	969.43+/- 4%	919.90+/- 2%	0.00+/- 0%	937.23+/- 2%
	Beta 3420 77	0 00	0 00	32 20	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0094	0 0000	0 0000	0 0000

(* indicates a rejected filer)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
10 FRONT	Raw	1 02	0 00	0 00	0 93	0 92	0 92
	Raw	0 99	0 00	0 00	0 93	0 92	0 92
	Raw	0 96	0 00	0 00	0 96	0 95	0 93
	Ave	0 99+/- 3%	0 00+/- 0%	0 00+/- 0%	0 94+/- 2%	0 93+/- 2%	0 92+/- 1%
	Beta	0 07	0 00	0 00	0 02	0 01	0 00
	Ratio	1 00	0 0000	0 0000	0 2548	0 1154	0 0000
10 BACK	Raw	1 01	0 00	0 00	0 98	0 92	0 92
	Raw	1 01	0 00	0 00	0 94	0 90	0 92
	Raw	0 97	0 00	0 00	0 94	0 94	0 90
	Ave	0 99+/- 2%	0 00+/- 0%	0 00+/- 0%	0 95+/- 3%	0 92+/- 2%	0 91+/- 1%
	Beta	0 08	0 00	0 00	0 04	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 5000	0 0500	0 0000
11 FRONT	Raw	362 70	0 00	0 00	342 10	402 00	372 10
	Raw	375 20	0 00	0 00	345 30	382 30	394 00
	Raw	361 00	0 00	0 00	310 70*	386 60	395 50
	Ave	366 30+/- 2%	0 00+/- 0%	0 00+/- 0%	343 70+/- 1%	390 30+/- 3%	387 20+/- 3%
	Beta	0 00	0 00	0 00	0 00	3 10	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0000	0 0000
11 BACK	Raw	356 40	0 00	0 00	367 10	388 60	420 20
	Raw	363 70	0 00	0 00	372 10	404 30	406 80
	Raw	373 50	0 00	0 00	345 20	416 00	409 30
	Ave	364 53+/- 2%	0 00+/- 0%	0 00+/- 0%	361 47+/- 4%	402 97+/- 3%	412 10+/- 2%
	Beta	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0000	0 0000
12 FRONT	Raw	305 20	0 00	0 00	294 60	308 80	270 30
	Raw	357 90	0 00	0 00	294 70	292 00	263 30
	Raw	334 30	0 00	0 00	317 70	303 80	260 50
	Ave	332 47+/- 8%	0 00+/- 0%	0 00+/- 0%	302 33+/- 4%	301 53+/- 3%	264 70+/- 2%
	Beta	67 77	0 00	0 00	37 63	36 83	0 00
	Ratio	1 00	0 0000	0 0000	0 5553	0 5435	0 0000
12 BACK	Raw	336 00	0 00	0 00	300 40	275 90	284 60
	Raw	511 20	0 00	0 00	304 90	259 00	287 40
	Raw	466 70	0 00	0 00	304 10	282 90	296 00
	Ave	437 97+/- 21%	0 00+/- 0%	0 00+/- 0%	303 13+/- 1%	272 60+/- 5%	289 33+/- 2%
	Beta	148 63	0 00	0 00	13 80	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0928	0 0000	0 0000

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	125" #7 (nc)
13 FRONT	Raw 183.50	0.00	0.00	111.40	103.00	0.00	97.48
	Raw 181.90	0.00	0.00	109.10	99.26	0.00	96.79
	Raw 186.20	0.00	0.00	112.00	103.50	0.00	99.27
	Ave 183.87+/- 1%	0.00+/- 0%	0.00+/- 0%	110.83+/- 1%	101.92+/- 2%	0.00+/- 0%	97.85+/- 1%
	Beta 86.02	0.00	0.00	12.99	4.07	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1510	0.0474	0.0000	
13 BACK	Raw 121.50	0.00	0.00	98.50	98.28	0.00	97.92
	Raw 117.70	0.00	0.00	97.64	97.88	0.00	99.01
	Raw 119.10	0.00	0.00	97.40	96.98	0.00	100.70
	Ave 119.43+/- 2%	0.00+/- 0%	0.00+/- 0%	97.85+/- 1%	97.71+/- 1%	0.00+/- 0%	99.21+/- 1%
	Beta 20.22	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
14 FRONT	Raw 396.00	0.00	0.00	366.00	365.90	0.00	346.10
	Raw 427.80	0.00	0.00	385.50	365.20	0.00	356.30
	Raw 433.20	0.00	0.00	379.70	359.10	0.00	361.50
	Ave 419.00+/- 5%	0.00+/- 0%	0.00+/- 0%	377.07+/- 3%	363.40+/- 1%	0.00+/- 0%	354.63+/- 2%
	Beta 64.37	0.00	0.00	22.43	8.77	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3485	0.1362	0.0000	
14 BACK	Raw 367.40	0.00	0.00	335.60	362.80	0.00	335.60
	Raw 347.70	0.00	0.00	348.50	356.70	0.00	355.10
	Raw 341.20	0.00	0.00	324.70	347.20	0.00	340.10
	Ave 352.10+/- 4%	0.00+/- 0%	0.00+/- 0%	336.27+/- 4%	355.57+/- 2%	0.00+/- 0%	343.60+/- 3%
	Beta 8.50	0.00	0.00	0.00	11.97	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	1.4078	0.0000	
15 FRONT	Raw 2937.00	0.00	0.00	2938.00	1352.00	0.00	1375.00
	Raw 2989.00	0.00	0.00	2873.00	1362.00	0.00	1320.00
	Raw 2952.00	0.00	0.00	2798.00	1537.00*	0.00	1472.00*
	Ave 2959.33+/- 1%	0.00+/- 0%	0.00+/- 0%	2869.67+/- 2%	1357.00+/- 1%	0.00+/- 0%	1347.50+/- 3%
	Beta 1611.83	0.00	0.00	1522.17	9.50	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.9444	0.0059	0.0000	
15 BACK	Raw 4828.00	0.00	0.00	3368.00	1497.00	0.00	1642.00
	Raw 5054.00	0.00	0.00	3079.00	1354.00*	0.00	1606.00
	Raw 4875.00	0.00	0.00	3112.00	1533.00	0.00	1650.00
	Ave 4919.00+/- 2%	0.00+/- 0%	0.00+/- 0%	3186.33+/- 5%	1515.00+/- 2%	0.00+/- 0%	1632.67+/- 1%
	Beta 3286.33	0.00	0.00	1553.67	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.4728	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
16 FRONT	Raw 390.30	0.00	0.00	374.70	382.30	0.00	353.30
	Raw 399.40	0.00	0.00	381.70	360.80	0.00	359.60
	Raw 398.70	0.00	0.00	352.90	391.60	0.00	362.70
	Ave 396.13+/- 1%	0.00+/- 0%	0.00+/- 0%	369.77+/- 4%	374.90+/- 3%	0.00+/- 0%	358.53+/- 1%
	Beta 37.60	0.00	0.00	11.23	16.37	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2988	0.4353	0.0000	
16 BACK	Raw 378.60*	0.00	0.00	362.00	395.40	0.00	364.90
	Raw 417.80	0.00	0.00	375.00	367.80	0.00	341.70
	Raw 414.00	0.00	0.00	369.80	361.80	0.00	361.50
	Ave 415.90+/- 1%	0.00+/- 0%	0.00+/- 0%	368.93+/- 2%	375.00+/- 5%	0.00+/- 0%	356.03+/- 4%
	Beta 59.87	0.00	0.00	12.90	18.97	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2155	0.3168	0.0000	
17 FRONT	Raw 1.43	0.00	0.00	1.27	1.27	0.00	1.23
	Raw 1.46	0.00	0.00	1.20	1.19	0.00	1.14
	Raw 1.42	0.00	0.00	1.23	1.19	0.00	1.25
	Ave 1.44+/- 1%	0.00+/- 0%	0.00+/- 0%	1.23+/- 3%	1.22+/- 4%	0.00+/- 0%	1.21+/- 5%
	Beta 0.23	0.00	0.00	0.03	0.01	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1111	0.0351	0.0000	
17 BACK	Raw 1.44	0.00	0.00	1.25	1.23	0.00	1.23
	Raw 1.47	0.00	0.00	1.22	1.20	0.00	1.29
	Raw 1.40	0.00	0.00	1.28	1.24	0.00	1.26
	Ave 1.43+/- 3%	0.00+/- 0%	0.00+/- 0%	1.25+/- 3%	1.22+/- 1%	0.00+/- 0%	1.26+/- 2%
	Beta 0.17	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
18 FRONT	Raw 664.80	0.00	0.00	589.60	590.30	0.00	622.90
	Raw 679.10	0.00	0.00	550.80	588.60	0.00	539.90
	Raw 692.00	0.00	0.00	577.40	570.20	0.00	576.70
	Ave 678.63+/- 2%	0.00+/- 0%	0.00+/- 0%	572.60+/- 3%	583.03+/- 2%	0.00+/- 0%	579.83+/- 7%
	Beta 98.80	0.00	0.00	0.00	3.20	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0324	0.0000	
18 BACK	Raw 1305.00	0.00	0.00	582.70	602.10	0.00	558.40
	Raw 1135.00	0.00	0.00	589.00	595.10	0.00	557.50
	Raw 651.00	0.00	0.00	587.70	574.90	0.00	555.00
	Ave 1030.33+/- 33%	0.00+/- 0%	0.00+/- 0%	586.47+/- 1%	590.70+/- 2%	0.00+/- 0%	556.97+/- 0%
	Beta 473.37	0.00	0.00	29.50	33.73	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0623	0.0713	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
19 FRONT	Raw 309.10 Raw 285.60 Raw 265.10 Ave 286.60 +/- 8% Beta 286.60 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	238.80 253.10 226.80 239.57 +/- 5% 239.57 0.8359	235.50 247.40 247.80 243.57 +/- 3% 243.57 0.8498	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00
19 BACK	Raw 327.30 Raw 336.10 Raw 326.00 Ave 329.80 +/- 2% Beta 89.57 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	227.70 234.20 243.00 234.97 +/- 3% 0.00 0.0000	227.60 245.10 231.80 234.83 +/- 4% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	234.70 243.60 242.40 240.23 +/- 2% 0.00
21 FRONT	Raw 315.60 Raw 313.40 Raw 321.30 Ave 316.77 +/- 1% Beta 61.40 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	269.00 251.80 261.60 260.80 +/- 3% 5.43 0.0885	269.70 258.90 267.10 265.23 +/- 2% 9.87 0.1607	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	267.80 249.30 249.00 255.37 +/- 4% 0.00
21 BACK	Raw 866.60 Raw 1144.00 Raw 1032.00 Ave 1014.20 +/- 14% Beta 760.30 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	270.00 260.80 268.60 266.47 +/- 2% 12.57 0.0165	254.40 244.00 264.70 254.37 +/- 4% 0.47 0.0006	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	255.80 257.10 248.80 253.90 +/- 2% 0.00
23 FRONT	Raw 3197.00 Raw 3234.00 Raw 3005.00 Ave 3145.33 +/- 4% Beta 0.00 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	4928.00 5256.00 4939.00 5041.00 +/- 4% 1835.33 0.0000	5563.00 5228.00 5074.00 5288.33 +/- 5% 2082.67 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	3224.00 3221.00 3172.00 3205.67 +/- 1% 0.00
23 BACK	Raw 6466.00 Raw 6935.00 Raw 6618.00 Ave 6673.00 +/- 4% Beta 3381.00 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	9283.00 9006.00 9024.00 9104.33 +/- 2% 5812.33 1.7191	7601.00 8012.00 7566.00 7726.33 +/- 3% 4434.33 1.3115	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	3564.00* 3222.00 3362.00 3292.00 +/- 3% 0.00

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
25 FRONT	Raw 923 60	0 00	0 00	809 80	941 70	0 00	933 20
	Raw 941 90	0 00	0 00	811 30	871 80	0 00	884 30
	Raw 942 60	0 00	0 00	840 30	930 60	0 00	874 20
	Ave 936 03+/- 1%	0 00+/- 0%	0 00+/- 0%	820 47+/- 2%	914 70+/- 4%	0 00+/- 0%	897 23+/- 4%
	Beta 38 80	0 00	0 00	0 00	17 47	0 00	0 00
25 BACK	Raw 942 00	0 00	0 00	836 20	700 70	0 00	841 80
	Raw 941 90	0 00	0 00	868 20	740 30	0 00	823 00
	Raw 919 30	0 00	0 00	878 00	742 70	0 00	796 00
	Ave 934 40+/- 1%	0 00+/- 0%	0 00+/- 0%	860 80+/- 3%	727 90+/- 3%	0 00+/- 0%	820 27+/- 3%
	Beta 114 13	0 00	0 00	40 53	0 00	0 00	0 00
26 FRONT	Raw 426 80	0 00	0 00	198 00	192 60	0 00	181 40
	Raw 416 80	0 00	0 00	195 30	186 90	0 00	171 70
	Raw 397 40	0 00	0 00	205 20	187 70	0 00	176 60
	Ave 413 67+/- 4%	0 00+/- 0%	0 00+/- 0%	199 50+/- 3%	189 07+/- 2%	0 00+/- 0%	176 57+/- 3%
	Beta 237 10	0 00	0 00	22 93	12 50	0 00	0 00
26 BACK	Raw 232 10	0 00	0 00	182 00	180 90	0 00	195 50
	Raw 233 00	0 00	0 00	194 00	193 50	0 00	181 40
	Raw 226 40	0 00	0 00	197 50	183 80	0 00	189 40
	Ave 230 50+/- 2%	0 00+/- 0%	0 00+/- 0%	191 17+/- 4%	186 07+/- 4%	0 00+/- 0%	188 77+/- 4%
	Beta 41 73	0 00	0 00	2 40	0 00	0 00	0 00
27 FRONT	Raw 187 30	0 00	0 00	183 30	187 40	0 00	179 40
	Raw 154 40*	0 00	0 00	172 40	184 20	0 00	179 70
	Raw 192 90	0 00	0 00	174 00	178 80	0 00	177 10
	Ave 190 10+/- 2%	0 00+/- 0%	0 00+/- 0%	176 57+/- 3%	183 47+/- 2%	0 00+/- 0%	178 73+/- 1%
	Beta 11 37	0 00	0 00	0 00	4 73	0 00	0 00
27 BACK	Raw 159 70	0 00	0 00	151 30	159 20	0 00	163 00
	Raw 155 70	0 00	0 00	156 50	173 30	0 00	170 50
	Raw 157 70	0 00	0 00	151 70	168 80	0 00	166 10
	Ave 157 70+/- 1%	0 00+/- 0%	0 00+/- 0%	153 17+/- 2%	167 10+/- 4%	0 00+/- 0%	166 53+/- 2%
	Beta 0 00	0 00	0 00	0 00	0 57	0 00	0 00

(* indicates a rejected filer)

Pre-Cross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
29 FRONT	Raw 78.19	0.00	0.00	61.22	62.53	0.00	57.89
	Raw 78.70	0.00	0.00	63.58	59.77	0.00	60.29
	Raw 74.76	0.00	0.00	63.82	62.86	0.00	55.60
	Ave 77.22+/- 3%	0.00+/- 0%	0.00+/- 0%	62.87+/- 2%	61.72+/- 3%	0.00+/- 0%	57.93+/- 4%
	Beta 19.29	0.00	0.00	4.95	3.79	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2564	0.1966	0.0000	
29 BACK	Raw 62.01	0.00	0.00	53.64	51.60	0.00	55.41
	Raw 59.08	0.00	0.00	54.81	56.46	0.00	54.22
	Raw 58.18	0.00	0.00	58.57	54.91	0.00	54.36
	Ave 59.76+/- 3%	0.00+/- 0%	0.00+/- 0%	55.67+/- 5%	54.32+/- 5%	0.00+/- 0%	54.66+/- 1%
	Beta 5.09	0.00	0.00	1.01	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1983	0.0000	0.0000	
30 FRONT	Raw 100.90	0.00	0.00	65.34	64.82	0.00	57.37
	Raw 100.60	0.00	0.00	62.85	61.91	0.00	59.59
	Raw 100.60	0.00	0.00	66.86	61.30	0.00	59.95
	Ave 100.70+/- 0%	0.00+/- 0%	0.00+/- 0%	65.02+/- 3%	62.68+/- 3%	0.00+/- 0%	58.97+/- 2%
	Beta 41.73	0.00	0.00	6.05	3.71	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1449	0.0888	0.0000	
30 BACK	Raw 71.48	0.00	0.00	55.74	53.67	0.00	56.06
	Raw 71.72	0.00	0.00	55.41	55.32	0.00	58.56
	Raw 60.45*	0.00	0.00	56.15	55.99	0.00	58.64
	Ave 71.60+/- 0%	0.00+/- 0%	0.00+/- 0%	55.77+/- 1%	54.99+/- 2%	0.00+/- 0%	57.75+/- 3%
	Beta 13.85	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
34 FRONT	Raw 107.70	0.00	0.00	81.71	83.58	0.00	76.76
	Raw 110.20	0.00	0.00	84.40	80.82	0.00	73.45
	Raw 107.00	0.00	0.00	81.32	80.60	0.00	73.31
	Ave 108.30+/- 2%	0.00+/- 0%	0.00+/- 0%	82.48+/- 2%	81.67+/- 2%	0.00+/- 0%	74.51+/- 3%
	Beta 33.79	0.00	0.00	7.97	7.16	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2358	0.2119	0.0000	
34 BACK	Raw 71.42*	0.00	0.00	72.36	69.95*	0.00	74.02
	Raw 78.98	0.00	0.00	71.46	65.26*	0.00	74.95
	Raw 82.48	0.00	0.00	66.48	77.79*	0.00	75.66
	Ave 80.73+/- 3%	0.00+/- 0%	0.00+/- 0%	70.10+/- 5%	0.00+/- 9%	0.00+/- 0%	74.88+/- 1%
	Beta 5.85	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
36 FRONT	Raw 59 92	0.00	0.00	45.37	40.76	0.00	40.32
	Raw 53 32*	0.00	0.00	44.19	40.34	0.00	41.48
	Raw 57 22	0.00	0.00	48.39	42.85	0.00	44.03
	Ave 58.57+/- 3%	0.00+/- 0%	0.00+/- 0%	45.98+/- 5%	41.32+/- 3%	0.00+/- 0%	41.94+/- 5%
	Beta 16.63	0.00	0.00	4.04	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2430	0.0000	0.0000	
36 BACK	Raw 40 81	0.00	0.00	36.31	33.52	0.00	36.62
	Raw 38 94	0.00	0.00	35.00	32.92	0.00	32.20*
	Raw 38.08	0.00	0.00	36.45	32.56	0.00	37.02
	Ave 39.28+/- 4%	0.00+/- 0%	0.00+/- 0%	35.92+/- 2%	33.00+/- 1%	0.00+/- 0%	36.82+/- 1%
	Beta 2.46	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
37 FRONT	Raw 210 40	0.00	0.00	168.80	164.80	0.00	154.10
	Raw 210 90	0.00	0.00	173.70	160.50	0.00	146.30
	Raw 216 30	0.00	0.00	171.50	155.80	0.00	149.10
	Ave 212.53+/- 2%	0.00+/- 0%	0.00+/- 0%	171.33+/- 1%	160.37+/- 3%	0.00+/- 0%	149.83+/- 3%
	Beta 62.70	0.00	0.00	21.50	10.53	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3429	0.1680	0.0000	
37 BACK	Raw 950 70	0.00	0.00	220.40	244.90	0.00	169.30
	Raw 819.60	0.00	0.00	224.60	254.90	0.00	157.80
	Raw 866.60	0.00	0.00	223.70	235.00	0.00	165.60
	Ave 878.97+/- 8%	0.00+/- 0%	0.00+/- 0%	222.90+/- 1%	244.93+/- 4%	0.00+/- 0%	164.23+/- 4%
	Beta 714.73	0.00	0.00	58.67	80.70	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0821	0.1129	0.0000	
39 FRONT	Raw 67 74	0.00	0.00	56.82	56.64	0.00	57.91
	Raw 69.20	0.00	0.00	56.25	60.37	0.00	55.00
	Raw 74.58*	0.00	0.00	60.79	58.84	0.00	53.71
	Ave 68.47+/- 2%	0.00+/- 0%	0.00+/- 0%	57.95+/- 4%	58.62+/- 3%	0.00+/- 0%	55.54+/- 4%
	Beta 12.93	0.00	0.00	2.41	3.08	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1866	0.2379	0.0000	
39 BACK	Raw 68.23*	0.00	0.00	55.55	54.12	0.00	54.36
	Raw 62.86	0.00	0.00	57.22	52.75	0.00	51.81
	Raw 61.50	0.00	0.00	50.80*	57.78	0.00	58.85*
	Ave 62.18+/- 2%	0.00+/- 0%	0.00+/- 0%	56.39+/- 2%	54.88+/- 5%	0.00+/- 0%	53.09+/- 3%
	Beta 9.10	0.00	0.00	3.30	1.80	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3628	0.1777	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
40 FRONT	Raw 260 50	0 00	0 00	206 60*	186 20	0 00	213 50
	Raw 269 20	0 00	0 00	190 40	197 50	0 00	187 60*
	Raw 269 20	0 00	0 00	187 60	194 60	0 00	214 00
	Ave 266.30 +/- 2%	0 00 +/- 0%	0 00 +/- 0%	189 00 +/- 1%	192.77 +/- 3%	0 00 +/- 0%	213.75 +/- 0%
	Beta 52.55	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
40 BACK	Raw 1478 00	0 00	0 00	288 80	254 30	0 00	238 20
	Raw 1386 00	0 00	0 00	305 30	275 50	0 00	226 20
	Raw 1639 00	0 00	0 00	296 40	253 70	0 00	228 60
	Ave 1501 00 +/- 9%	0 00 +/- 0%	0 00 +/- 0%	296.83 +/- 3%	261.17 +/- 5%	0 00 +/- 0%	231.00 +/- 3%
	Beta 1270 00	0 00	0 00	65 83	30 17	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0518	0 0238	0 0000	
41 FRONT	Raw 509 60	0 00	0 00	465 50	483 50	0 00	463 10
	Raw 502 80	0 00	0 00	496 80*	479 10	0 00	474 50
	Raw 523 50	0 00	0 00	445 60	502 80	0 00	478 20
	Ave 511 97 +/- 2%	0 00 +/- 0%	0 00 +/- 0%	455.55 +/- 3%	488.47 +/- 3%	0 00 +/- 0%	471.93 +/- 2%
	Beta 40 03	0 00	0 00	0 00	16 53	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 4130	0 0000	
41 BACK	Raw 556 90	0 00	0 00	489 70	469 10	0 00	466 30
	Raw 547 10	0 00	0 00	470 70	460 10	0 00	450 10
	Raw 577 80	0 00	0 00	478 70	423 90*	0 00	457 60
	Ave 560 60 +/- 3%	0 00 +/- 0%	0 00 +/- 0%	479 70 +/- 2%	464.60 +/- 1%	0 00 +/- 0%	458.00 +/- 2%
	Beta 102 60	0 00	0 00	21 70	6 60	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2115	0 0643	0 0000	
43 FRONT	Raw 146 10	0 00	0 00	91 14*	79 14	0 00	82 74
	Raw 141 80	0 00	0 00	83 90	82 48	0 00	86 55
	Raw 140 50	0 00	0 00	83 46	91 10*	0 00	79 24
	Ave 142 80 +/- 2%	0 00 +/- 0%	0 00 +/- 0%	83.68 +/- 0%	80.81 +/- 3%	0 00 +/- 0%	82.84 +/- 4%
	Beta 59 96	0 00	0 00	0 84	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0140	0 0000	0 0000	
43 BACK	Raw 104 10	0 00	0 00	81 26	74 42	0 00	78 38
	Raw 98 02	0 00	0 00	78 62	76 22	0 00	74 53
	Raw 99 82	0 00	0 00	75 18	70 88	0 00	75 64
	Ave 100.65 +/- 3%	0 00 +/- 0%	0 00 +/- 0%	78.35 +/- 4%	73.84 +/- 4%	0 00 +/- 0%	76.18 +/- 3%
	Beta 24 46	0 00	0 00	2 17	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0887	0 0000	0 0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
44 FRONT	Raw 151 90	0 00	0 00	92 25	96 26	0 00	88 58
	Raw 150 40	0 00	0 00	92 07	94 73	0 00	95 34
	Raw 143 60	0 00	0 00	92 46	96 04	0 00	94 45
	Ave 148 63+/- 3%	0 00+/- 0%	0 00+/- 0%	92 26+/- 0%	95 68+/- 1%	0 00+/- 0%	92 79+/- 4%
	Beta 55 84	0 00	0 00	0 00	2 89	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0517	0 0000	
44 BACK	Raw 388 70	0 00	0 00	110 10	107 00	0 00	89 91
	Raw 368 30	0 00	0 00	110 10	102 10	0 00	88 09
	Raw 364 80	0 30	0 00	122 70*	102 10	0 00	91 73
	Ave 373 93+/- 3%	0 00+/- 0%	0 00+/- 0%	110 10+/- 0%	103 73+/- 3%	0 00+/- 0%	89 91+/- 2%
	Beta 284 02	0 00	0 00	20 19	13 82	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0711	0 0487	0 0000	
45 FRONT	Raw 112 80	0 00	0 00	81 73	81 45	0 00	73 35
	Raw 103 00*	0 00	0 00	82 56	82 06	0 00	76 77
	Raw 112 70	0 00	0 00	78 13	80 69	0 00	75 88
	Ave 112 75+/- 0%	0 00+/- 0%	0 00+/- 0%	80 81+/- 3%	81 40+/- 1%	0 00+/- 0%	75 33+/- 2%
	Beta 37 42	0 00	0 00	5 47	6 07	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1463	0 1621	0 0000	
45 BACK	Raw 86 81	0 00	0 00	76 65	71 03	0 00	73 33
	Raw 82 71	0 00	0 00	77 62	77 00	0 00	76 88
	Raw 87 19	0 00	0 00	76 32	72 18	0 00	73 04
	Ave 85 57+/- 3%	0 00+/- 0%	0 00+/- 0%	76 86+/- 1%	73 40+/- 4%	0 00+/- 0%	74 42+/- 3%
	Beta 11 15	0 00	0 00	2 45	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2194	0 0000	0 0000	
46 FRONT	Raw 275 20	0 00	0 00	185 50	172 30	0 00	176 90
	Raw 208 00	0 00	0 00	194 60	166 20	0 00	166 60
	Raw 307 50	0 00	0 00	184 80	157 80	0 00	178 30
	Ave 263 57+/- 19%	0 00+/- 0%	0 00+/- 0%	188 30+/- 3%	165 43+/- 4%	0 00+/- 0%	173 93+/- 4%
	Beta 89 63	0 00	0 00	14 37	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1603	0 0000	0 0000	
46 BACK	Raw 1238 00	0 00	0 00	228 10	196 40	0 00	163 56
	Raw 1185 00	0 00	0 00	216 50	193 80	0 00	169 30
	Raw 1127 00	0 00	0 00	214 30	204 10	0 00	160 30
	Ave 1183 33+/- 5%	0 00+/- 0%	0 00+/- 0%	219 63+/- 3%	198 10+/- 3%	0 00+/- 0%	164 37+/- 3%
	Beta 1018 97	0 00	0 00	55 27	33 73	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0542	0 0331	0 0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	OC5" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
48 FRONT	Raw 68.67	0.00	0.00	56.97	51.87	0.00	53.48
	Raw 65.01	0.00	0.00	53.30	54.05	0.00	47.38*
	Raw 68.39	0.00	0.00	55.67	54.06	0.00	51.99
	Ave 67.36+/- 3%	0.00+/- 0%	0.00+/- 0%	55.31+/- 3%	53.33+/- 2%	0.00+/- 0%	52.74+/- 2%
	Beta 14.62	0.00	0.00	2.58	0.59	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1763	0.0405	0.0000	
48 BACK	Raw 61.67	0.00	0.00	50.13	51.52	0.00	51.22
	Raw 57.63	0.00	0.00	51.74	48.31	0.00	47.94
	Raw 52.56	0.00	0.00	52.70	51.01	0.00	50.84
	Ave 57.29+/- 8%	0.00+/- 0%	0.00+/- 0%	51.52+/- 3%	50.28+/- 3%	0.00+/- 0%	50.00+/- 4%
	Beta 7.29	0.00	0.00	1.52	0.28	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2091	0.0384	0.0000	
49 FRONT	Raw11710.00	0.00	0.00	3991.00	5838.00	0.00	4711.00
	Raw12600.00	0.00	0.00	4425.00*	5897.00	0.00	5550.00
	Raw14610.00	0.00	0.00	4107.00	4400.00*	0.00	4269.00
	Ave12973.33+/-11%	0.00+/- 0%	0.00+/- 0%	4044.00+/- 2%	5867.50+/- 1%	0.00+/- 0%	4843.33+/-13%
	Beta 8130.00	0.00	0.00	0.00	1024.17	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.1260	0.0000	
49 BACK	Raw49580.00	0.00	0.00	10820.00	7611.00	0.00	3949.00
	Raw53970.00	0.00	0.00	10490.00	7059.00	0.00	3597.00
	Raw47020.00	0.00	0.00	9225.00*	7497.00	0.00	3720.00
	Ave50190.00+/- 7%	0.00+/- 0%	0.00+/- 0%	10655.00+/- 2%	7389.00+/- 4%	0.00+/- 0%	3755.33+/- 5%
	Beta46434.67	0.00	0.00	6899.67	3633.67	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1486	0.0783	0.0000	
50 FRONT	Raw 386.70	0.00	0.00	280.10	275.00	0.00	288.00
	Raw 383.90	0.00	0.00	263.50	267.10	0.00	278.80
	Raw 362.30	0.00	0.00	260.10	232.70*	0.00	284.50
	Ave 377.63+/- 4%	0.00+/- 0%	0.00+/- 0%	270.57+/- 3%	271.05+/- 2%	0.00+/- 0%	283.77+/- 2%
	Beta 93.87	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
50 BACK	Raw 2136.00	0.00	0.00	355.60	332.30	0.00	278.30
	Raw 1991.00	0.00	0.00	370.10	308.00	0.00	294.70
	Raw 2049.00	0.00	0.00	360.40	338.60	0.00	269.70
	Ave 2058.67+/- 4%	0.00+/- 0%	0.00+/- 0%	362.03+/- 2%	326.30+/- 5%	0.00+/- 0%	280.90+/- 5%
	Beta 1777.77	0.00	0.00	81.13	45.40	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0456	0.0255	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
51 FRONT	Raw 112 80	0.00	0.00	92.28	83.42	0.00	79.07
	Raw 116 80	0.00	0.00	89.51	82.22	0.00	75.09
	Raw 116 80	0.00	0.00	88.47	85.48	0.00	79.23
	Ave 115.47 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	90.09 +/- 2%	83.71 +/- 2%	0.00 +/- 0%	77.80 +/- 3%
	Beta 37.67	0.00	0.00	12.29	5.91	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3263	0.1569	0.0000	
51 BACK	Raw 82 62	0.00	0.00	81.68	70.00	0.00	79.42
	Raw 78 50	0.00	0.00	81.37	74.23	0.00	76.53
	Raw 90 15	0.00	0.00	77.99	77.28	0.00	73.61
	Ave 83.76 +/- 7%	0.00 +/- 0%	0.00 +/- 0%	80.35 +/- 3%	73.84 +/- 5%	0.00 +/- 0%	76.52 +/- 4%
	Beta 7.24	0.00	0.00	3.83	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.5288	0.0000	0.0000	
52 FRONT	Raw 1.53	0.00	0.00	1.24	1.28	0.00	1.34
	Raw 1.61	0.00	0.00	1.30	1.18	0.00	1.28
	Raw 1.51	0.00	0.00	1.26	1.28	0.00	1.26
	Ave 1.55 +/- 3%	0.00 +/- 0%	0.00 +/- 0%	1.26 +/- 2%	1.25 +/- 4%	0.00 +/- 0%	1.29 +/- 3%
	Beta 0.25	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
52 BACK	Raw 2.05	0.00	0.00	1.37	1.35	0.00	1.24
	Raw 2.09	0.00	0.00	1.29	1.30	0.00	1.30
	Raw 2.64*	0.00	0.00	1.28	1.25	0.00	1.24
	Ave 2.07 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	1.31 +/- 4%	1.30 +/- 4%	0.00 +/- 0%	1.26 +/- 3%
	Beta 0.81	0.00	0.00	0.05	0.04	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0627	0.0478	0.0000	
53 FRONT	Raw 1.45	0.00	0.00	1.25	1.06*	0.00	1.12
	Raw 1.37	0.00	0.00	1.24	1.18	0.00	1.15
	Raw 1.39	0.00	0.00	1.23	1.15	0.00	1.10
	Ave 1.40 +/- 3%	0.00 +/- 0%	0.00 +/- 0%	1.24 +/- 1%	1.17 +/- 2%	0.00 +/- 0%	1.12 +/- 2%
	Beta 0.28	0.00	0.00	0.12	0.04	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.4143	0.1500	0.0000	
53 BACK	Raw 1.44*	0.00	0.00	1.18	1.16	0.00	1.04
	Raw 1.58	0.00	0.00	1.12	1.04*	0.00	1.20*
	Raw 1.57	0.00	0.00	1.12	1.18	0.00	1.08
	Ave 1.57 +/- 0%	0.00 +/- 0%	0.00 +/- 0%	1.14 +/- 3%	1.17 +/- 1%	0.00 +/- 0%	1.06 +/- 3%
	Beta 0.51	0.00	0.00	0.08	0.11	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1530	0.2140	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
54 FRONT	Raw	1.13	0.00	0.00	1.15	1.10*	0.00	1.07
	Raw	1.19	0.00	0.00	1.21	1.22	0.00	1.11
	Raw	1.31	0.00	0.00	1.10	1.16	0.00	1.10
	Ave	1.21+/- 8%	0.00+/- 0%	0.00+/- 0%	1.16+/- 5%	1.19+/- 3%	0.00+/- 1%	1.09+/- 2%
	Beta	0.11	0.00	0.00	0.06	0.10	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.5412	0.8588	0.0000	
54 BACK	Raw	1.39	0.00	0.00	1.14	1.16	0.00	1.15
	Raw	1.37	0.00	0.00	1.13	1.21	0.00	1.10
	Raw	1.48	0.00	0.00	1.14	1.12	0.00	1.12
	Ave	1.41+/- 4%	0.00+/- 0%	0.00+/- 0%	1.14+/- 1%	1.16+/- 4%	0.00+/- 0%	1.12+/- 2%
	Beta	0.29	0.00	0.00	0.01	0.04	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0463	0.1389	0.0000	
55 FRONT	Raw	2.48	0.00	0.00	1.65	1.63	0.00	1.58
	Raw	1.71*	0.00	0.00	1.57	1.50	0.00	1.70
	Raw	2.54	0.00	0.00	1.59	1.73	0.00	1.63
	Ave	2.51+/- 2%	0.00+/- 0%	0.00+/- 0%	1.60+/- 3%	1.62+/- 7%	0.00+/- 0%	1.64+/- 4%
	Beta	0.87	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
55 BACK	Raw	2.01	0.00	0.00	1.59	1.54	0.00	1.54
	Raw	2.22	0.00	0.00	1.61	1.51	0.00	1.54
	Raw	2.53	0.00	0.00	1.63	1.50	0.00	1.43
	Ave	2.25+/- 12%	0.00+/- 0%	0.00+/- 0%	1.61+/- 1%	1.52+/- 1%	0.00+/- 0%	1.50+/- 4%
	Beta	0.75	0.00	0.00	0.11	0.02	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1474	0.0231	0.0000	
56 FRONT	Raw	2.29	0.00	0.00	1.54	1.67	0.00	1.50
	Raw	2.17	0.00	0.00	1.65	1.72	0.00	1.44
	Raw	2.44	0.00	0.00	1.66	1.62	0.00	1.53
	Ave	2.30+/- 6%	0.00+/- 0%	0.00+/- 0%	1.61+/- 4%	1.67+/- 3%	0.00+/- 0%	1.49+/- 3%
	Beta	0.81	0.00	0.00	0.12	0.18	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1535	0.2211	0.0000	
56 BACK	Raw	2.28	0.00	0.00	1.60	1.38	0.00	1.53
	Raw	2.21	0.00	0.00	1.58	1.42	0.00	1.35*
	Raw	2.44	0.00	0.00	1.59	1.54*	0.00	1.51
	Ave	2.31+/- 5%	0.00+/- 0%	0.00+/- 0%	1.59+/- 1%	1.40+/- 2%	0.00+/- 0%	1.52+/- 1%
	Beta	0.79	0.00	0.00	0.07	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0901	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	054" #6 (nc)	125" #7 (nc)
57 FRONT							
Raw	2.49	0.00	0.00	1.74	1.68	0.00	1.62
Raw	2.53	0.00	0.00	1.66	1.68	0.00	1.56
Raw	2.60	0.00	0.00	1.83	1.72	0.00	1.58
Ave	2.54+/- 2%	0.00+/- 0%	0.00+/- 0%	1.75+/- 5%	1.69+/- 1%	0.00+/- 0%	1.59+/- 2%
Beta	0.96	0.00	0.00	0.16	0.11	0.00	0.00
Ratio	1.00	0.0000	0.0000	0.1675	0.1104	0.0000	
57 BACK							
Raw	2.94	0.00	0.00	1.74	1.67	0.00	1.50*
Raw	2.78	0.00	0.00	1.68	1.62	0.00	1.67
Raw	3.12	0.00	0.00	1.74	1.61	0.00	1.61
Ave	2.95+/- 6%	0.00+/- 0%	0.00+/- 0%	1.72+/- 2%	1.63+/- 2%	0.00+/- 0%	1.64+/- 3%
Beta	1.31	0.00	0.00	0.08	0.00	0.00	0.00
Ratio	1.00	0.0000	0.0000	0.0616	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Cross Decontamination Experiment, exposed J2/B1 (TLD set #1)

*** RESULTS ***

CALCULATED DOSES

Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factor 030" (rad/nc)	064" (rad/nc)	Ave (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
1 FRONT	0.00	0.00	0.45	0.99	0.00	0.72	14.82	10.65	5.80	14.07	1.32
1 BACK	0.00	0.00	0.99	0.99	0.00	0.99	38.04	37.67	35.89	19.64	3.48
2 FRONT	0.00	0.00	0.99	0.99	0.00	0.67	48.43	32.67	26.53	159.01	14.87
2 BACK	0.00	0.00	0.62	0.99	0.00	0.74	709.53	524.15	125.76	174.47	16.38
3 FRONT	0.00	0.00	0.76	0.99	0.00	0.79	299.70	238.05	16.32	44.87	4.46
3 BACK	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	47.98	4.49
4 FRONT	0.00	0.00	0.88	0.99	0.00	0.91	443.12	401.97	25.80	32.69	3.16
4 BACK	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	39.74	3.90
5 FRONT	0.00	0.00	0.85	0.99	0.00	0.92	162.43	148.65	77.18	39.81	3.76
5 BACK	0.00	0.00	0.99	0.99	0.00	0.99	9.60	9.50	6.59	44.73	4.37
6 FRONT	0.00	0.00	0.88	0.99	0.00	0.93	102.73	95.85	23.92	112.61	11.26
6 BACK	0.00	0.00	0.86	0.99	0.00	0.86	1235.25	1056.22	22.86	120.12	11.19
7 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	55.68	55.13	20.83	114.50	11.44
7 BACK	0.00	0.00	0.82	0.99	0.00	0.86	1021.17	882.73	70.81	123.37	11.70
8 FRONT	0.00	0.00	0.64	0.99	0.00	0.70	45.43	31.70	6.58	109.25	10.21
8 BACK	0.00	0.00	0.90	0.99	0.00	0.87	1333.77	1156.39	79.11	126.58	11.89
9 FRONT	0.00	0.00	0.35	0.99	0.00	0.35	57.35	20.14	9.65	190.33	18.23
9 BACK	0.00	0.00	0.98	0.99	0.00	0.98	3420.77	3362.59	1092.07	224.37	21.21
10 FRONT	0.00	0.00	0.61	0.99	0.00	0.66	0.07	0.05	0.02	0.22	0.02
10 BACK	0.00	0.00	0.35	0.99	0.00	0.61	0.08	0.05	0.03	0.22	0.02
11 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	92.70	9.17
11 BACK	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	98.66	9.33
12 FRONT	0.00	0.00	0.35	0.99	0.00	0.35	67.77	23.79	9.44	63.37	6.02
12 BACK	0.00	0.00	0.85	0.99	0.00	0.92	148.63	136.74	85.24	69.27	6.60
13 FRONT	0.00	0.00	0.76	0.99	0.00	0.82	86.02	70.60	7.42	23.42	2.20
13 BACK	0.00	0.00	0.99	0.99	0.00	0.99	20.22	20.02	2.35	23.75	2.23
14 FRONT	0.00	0.00	0.46	0.99	0.00	0.57	64.37	36.53	15.47	84.90	8.12
14 BACK	0.00	0.00	0.99	0.99	0.00	0.67	8.50	5.70	12.06	82.26	8.03
15 FRONT	0.00	0.00	0.35	0.99	0.00	0.66	1611.83	1069.78	713.26	322.59	31.41
15 BACK	0.00	0.00	0.35	0.99	0.00	0.67	3286.33	2203.82	1487.14	390.86	36.78
16 FRONT	0.00	0.00	0.54	0.99	0.00	0.44	37.60	16.73	5.88	85.83	8.06
16 BACK	0.00	0.00	0.66	0.99	0.00	0.51	59.87	30.41	14.78	85.23	8.48

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** RESULTS ***

CALCULATED DOSES

Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
17 FRONT	0 00	0 00	0 82	0 91	0 00	0 87	0 23	0 20	0 05	0 29	0 03
17 BACK	0 00	0 00	0 99	0 99	0 00	0 99	0 17	0 17	0 05	0 30	0 03
18 FRONT	0 00	0 00	0 99	0 91	0 00	0 95	98 80	94 08	42 00	138 81	16 30
18 BACK	0 00	0 00	0 90	0 82	0 00	0 86	473 37	406 94	292 73	133 34	12 41
19 FRONT	0 00	0 00	0 35	0 35	0 00	0 35	286 60	100 63	7 73	0 00	0 00
19 BACK	0 00	0 00	0 99	0 99	0 00	0 99	89 57	88 68	7 24	57 51	5 47
21 FRONT	0 00	0 00	0 86	0 61	0 00	0 74	61 40	45 15	13 51	61 13	6 24
21 BACK	0 00	0 00	0 97	0 99	0 00	0 98	760 30	742 74	136 99	60 78	5 75
23 FRONT	0 00	0 00	0 99	0 99	0 00	0 99	0 00	0 00	0 00	767 44	71 71
23 BACK	0 00	0 00	0 35	0 35	0 00	0 35	3381 00	1187 07	90 92	788 10	77 03
25 FRONT	0 00	0 00	0 99	0 35	0 00	0 67	38 80	26 02	28 41	214 80	21 56
25 BACK	0 00	0 00	0 45	0 99	0 00	0 72	114 13	82 39	47 32	196 37	19 08
26 FRONT	0 00	0 00	0 84	0 87	0 00	0 86	237 10	202 81	13 97	42 27	4 10
26 BACK	0 00	0 00	0 90	0 99	0 00	0 95	41 73	39 51	7 93	45 19	4 53
27 FRONT	0 00	0 00	0 99	0 35	0 00	0 67	11 37	7 62	5 86	42 79	3 99
27 BACK	0 00	0 00	0 99	0 99	0 00	0 99	0 00	0 00	0 00	39 87	3 82
29 FRONT	0 00	0 00	0 60	0 53	0 00	0 57	19 29	10 93	2 06	13 87	1 41
29 BACK	0 00	0 00	0 69	0 99	0 00	0 84	5 09	4 28	2 07	13 09	1 23
30 FRONT	0 00	0 00	0 77	0 78	0 00	0 78	41 73	32 41	1 14	14 12	1 35
30 BACK	0 00	0 00	0 99	0 99	0 00	0 99	13 85	13 71	1 46	13 83	1 33
34 FRONT	0 00	0 00	0 63	0 49	0 00	0 56	33 79	19 06	3 64	17 84	1 72
34 BACK	0 00	0 00	0 99	0 99	0 00	0 99	5 85	5 80	2 58	17 93	1 68
36 FRONT	0 00	0 00	0 62	0 99	0 00	0 81	16 63	13 41	4 83	10 04	1 04
36 BACK	0 00	0 00	0 99	0 99	0 00	0 99	2 46	2 43	1 41	8 81	0 82
37 FRONT	0 00	0 00	0 47	0 60	0 00	0 53	62 70	33 52	6 18	35 87	3 47
37 BACK	0 00	0 00	0 87	0 73	0 00	0 80	714 73	568 94	88 54	39 32	3 92
39 FRONT	0 00	0 00	0 71	0 43	0 00	0 57	12 93	7 38	2 86	13 30	1 34
39 BACK	0 00	0 00	0 44	0 53	0 00	0 48	9 10	4 41	1 13	12 71	1 26
40 FRONT	0 00	0 00	0 99	0 99	0 00	0 99	52 55	52 03	4 99	51 17	4 76
40 BACK	0 00	0 00	0 91	0 93	0 00	0 92	1270 00	1172 42	120 11	55 30	5 36
41 FRONT	0 00	0 00	0 99	0 35	0 00	0 67	40 03	26 85	20 13	112 98	10 67
41 BACK	0 00	0 00	0 67	0 84	0 00	0 76	102 60	77 48	18 11	109 65	10 38
43 FRONT	0 00	0 00	0 97	0 99	0 00	0 98	59 96	58 73	4 48	19 83	2 04
43 BACK	0 00	0 00	0 86	0 99	0 00	0 92	24 46	22 58	4 13	18 24	1 76

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** RESULTS ***

CALCULATED DOSES

Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave. (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
44 FRONT	0.00	0.00	0.99	0.87	0.00	0.93	55.84	51.91	7.17	22.21	2.25
44 BACK	0.00	0.00	0.88	0.88	0.00	0.88	284.02	249.79	11.54	21.52	2.05
45 FRONT	0.00	0.00	0.77	0.61	0.00	0.69	37.42	25.82	4.37	18.03	1.73
45 BACK	0.00	0.00	0.66	0.99	0.00	0.82	11.15	9.20	3.76	17.82	1.73
46 FRONT	0.00	0.00	0.75	0.99	0.00	0.87	89.63	77.90	47.03	41.64	4.16
46 BACK	0.00	0.00	0.91	0.91	0.00	0.91	1018.97	927.68	50.82	39.35	3.82
48 FRONT	0.00	0.00	0.72	0.90	0.00	0.81	14.62	11.84	2.57	12.62	1.20
48 BACK	0.00	0.00	0.67	0.90	0.00	0.79	7.29	5.74	4.03	11.97	1.19
49 FRONT	0.00	0.00	0.99	0.70	0.00	0.84	8130.00	6851.34	2176.99	1159.49	189.45
49 BACK	0.00	0.00	0.77	0.81	0.00	0.79	46434.67	36513.66	3082.13	899.03	93.91
50 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	93.87	92.94	14.00	67.93	6.41
50 BACK	0.00	0.00	0.92	0.93	0.00	0.93	1777.77	1645.79	69.54	67.25	6.95
51 FRONT	0.00	0.00	0.50	0.62	0.00	0.56	37.67	21.10	3.82	18.62	1.82
51 BACK	0.00	0.00	0.35	0.99	0.00	0.67	7.24	4.85	5.49	18.32	1.84
52 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.25	0.25	0.07	0.31	0.03
52 BACK	0.00	0.00	0.90	0.88	0.00	0.89	0.81	0.72	0.04	0.30	0.03
53 FRONT	0.00	0.00	0.36	0.64	0.00	0.50	0.28	0.14	0.06	0.27	0.03
53 BACK	0.00	0.00	0.76	0.49	0.00	0.62	0.51	0.32	0.10	0.25	0.02
54 FRONT	0.00	0.00	0.35	0.35	0.00	0.35	0.11	0.04	0.03	0.26	0.03
54 BACK	0.00	0.00	0.92	0.67	0.00	0.79	0.29	0.23	0.07	0.27	0.03
55 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.87	0.86	0.07	0.39	0.04
55 BACK	0.00	0.00	0.77	0.94	0.00	0.85	0.75	0.64	0.25	0.36	0.04
56 FRONT	0.00	0.00	0.76	0.47	0.00	0.62	0.81	0.50	0.19	0.36	0.04
56 BACK	0.00	0.00	0.85	0.99	0.00	0.92	0.79	0.73	0.13	0.36	0.03
57 FRONT	0.00	0.00	0.74	0.73	0.00	0.73	0.96	0.70	0.05	0.38	0.04
57 BACK	0.00	0.00	0.90	0.99	0.00	0.94	1.31	1.23	0.19	0.39	0.04

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate Error		Gamma Dose Rate Error	
				(rad/hr)	(rad/hr)	(rad/hr)	(rad/hr)
1 FRONT	10 65	14 07	288 0	3 70E-02	2 01E-02	4 88E-02	4 57E-03
1 BACK	37 67	19 64	288 0	1 31E-01	1 25E-01	6 82E-02	1 21E-02
2 FRONT	32 67	159 01	288 0	1 13E-01	9 21E-02	5 52E-01	5 16E-02
2 BACK	521 15	174 47	288 0	1 82E+00	4 37E-01	6 06E-01	5 69E-02
3 FRONT	238 05	44 87	288 0	8 27E-01	5 67E-02	1 56E-01	1 55E-02
3 BACK	0 00	47 98	288 0	0 00E+00	0 00E+00	1 67E-01	1 56E-02
4 FRONT	401 97	32 69	288 0	1 40E+00	8 96E-02	1 13E-01	1 10E-02
4 BACK	0 00	39 74	288 0	0 00E+00	0 00E+00	1 38E-01	1 36E-02
5 FRONT	148 65	39 81	288 0	5 16E-01	2 68E-01	1 38E-01	1 31E-02
5 BACK	9 50	44 73	288 0	3 30E-02	2 29E-02	1 55E-01	1 52E-02
6 FRONT	95 85	112 61	288 0	3 33E-01	8 31E-02	3 91E-01	3 91E-02
6 BACK	1056 22	120 12	288 0	3 67E+00	7 94E-02	4 17E-01	3 88E-02
7 FRONT	55 13	1 4 50	288 0	1 91E-01	7 23E-02	3 98E-01	3 97E-02
7 BACK	882 73	123 37	288 0	3 07E+00	2 46E-01	4 28E-01	4 06E-02
8 FRONT	31 70	109 25	288 0	1 10E-01	2 28E-02	3 79E-01	3 55E-02
8 BACK	1156 39	126 58	288 0	4 02E+00	2 75E-01	4 40E-01	4 13E-02
9 FRONT	20 14	190 33	288 0	6 99E-02	3 35E-02	6 61E-01	6 33E-02
9 BACK	3362 59	224 37	288 0	1 17E+01	3 79E+00	7 79E-01	7 36E-02
10 FRONT	0 05	0 22	1 0	4 59E-02	2 02E-02	2 21E-01	2 06E-02
10 BACK	0 05	0 22	1 0	4 90E-02	3 33E-02	2 19E-01	2 05E-02
11 FRONT	0 00	92 70	148 2	0 00E+00	0 00E+00	6 25E-01	6 19E-02
11 BACK	0 00	98 66	148 2	0 00E+00	0 00E+00	6 66E-01	6 30E-02
12 FRONT	23 79	63 37	148 2	1 61E-01	6 37E-02	4 28E-01	4 06E-02
12 BACK	136 74	69 27	148 2	9 23E-01	5 75E-01	4 67E-01	4 45E-02
13 FRONT	70 60	23 42	148 2	4 76E-01	5 01E-02	1 58E-01	1 48E-02
13 BACK	20 02	23 75	148 2	1 35E-01	1 59E-02	1 60E-01	1 51E-02
14 FRONT	36 53	84 90	148 2	2 47E-01	1 04E-01	5 73E-01	5 48E-02
14 BACK	5 70	82 26	148 2	3 85E-02	8 13E-02	5 55E-01	5 42E-02
15 FRONT	1069 78	322 59	148 2	7 22E+00	4 81E+00	2 18E+00	2 12E-01
15 BACK	2203 82	390 86	148 2	1 49E+01	1 00E+01	2 64E+00	2 48E-01
16 FRONT	16 73	85 83	148 2	1 13E-01	3 97E-02	5 79E-01	5 44E-02
16 BACK	30 41	85 23	148 2	2 05E-01	9 98E-02	5 75E-01	5 72E-02

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Dose Rate Error (rad/hr)	Gamma Dose Rate (rad/hr)	Dose Rate Error (rad/hr)
17 FRONT	0.20	0.29	1.0	1.97E-01	5.26E-02	2.89E-01	3.01E-02
17 BACK	0.17	0.30	1.0	1.73E-01	4.53E-02	3.01E-01	2.88E-02
18 FRONT	94.08	138.81	148.2	6.35E-01	2.83E-01	9.37E-01	1.10E-01
18 BACK	406.94	133.34	148.2	2.75E+00	1.98E+00	9.00E-01	8.37E-02
19 FRONT	100.63	0.00	148.2	6.79E-01	5.22E-02	0.00E+00	0.00E+00
19 BACK	88.68	57.51	148.2	5.98E-01	4.89E-02	3.88E-01	3.69E-02
21 FRONT	45.15	61.13	148.2	3.05E-01	9.11E-02	4.13E-01	4.21E-02
21 BACK	742.74	60.78	148.2	5.01E+00	9.24E-01	4.10E-01	3.88E-02
23 FRONT	0.00	767.44	148.2	0.00E+00	0.00E+00	5.18E+00	4.84E-01
23 BACK	1187.07	788.10	148.2	8.01E+00	6.14E-01	5.32E+00	5.20E-01
25 FRONT	26.02	214.80	148.2	1.76E-01	1.92E-01	1.45E+00	1.44E-01
25 BACK	82.39	196.37	148.2	5.56E-01	3.19E-01	1.33E+00	1.29E-01
26 FRONT	202.81	42.27	148.2	1.37E+00	9.43E-02	2.85E-01	2.77E-02
26 BACK	39.51	45.19	148.2	2.67E-01	5.35E-02	3.05E-01	3.06E-02
27 FRONT	7.62	42.79	148.2	5.14E-02	3.95E-02	2.89E-01	2.69E-02
27 BACK	0.00	39.87	148.2	0.00E+00	0.00E+00	2.69E-01	2.57E-02
29 FRONT	10.93	13.87	147.5	7.41E-02	1.39E-02	9.40E-02	9.53E-03
29 BACK	4.28	13.09	147.5	2.90E-02	1.40E-02	8.87E-02	8.32E-03
30 FRONT	32.41	14.12	147.5	2.20E-01	7.73E-03	9.57E-02	9.18E-03
30 BACK	13.71	13.83	147.5	9.29E-02	9.91E-03	9.37E-02	9.04E-03
34 FRONT	19.06	17.84	147.5	1.29E-01	2.47E-02	1.21E-01	1.17E-02
34 BACK	5.80	17.93	147.5	3.93E-02	1.75E-02	1.22E-01	1.14E-02
36 FRONT	13.41	10.04	147.5	9.09E-02	3.27E-02	6.81E-02	7.04E-03
36 BACK	2.43	8.81	147.5	1.65E-02	9.56E-03	5.98E-02	5.58E-03
37 FRONT	33.52	35.87	147.5	2.27E-01	4.19E-02	2.43E-01	2.35E-02
37 BACK	568.94	39.32	147.5	3.86E+00	6.00E-01	2.67E-01	2.66E-02
39 FRONT	7.38	13.30	147.5	5.00E-02	1.94E-02	9.01E-02	9.08E-03
39 BACK	4.41	12.71	147.5	2.99E-02	7.68E-03	8.61E-02	8.53E-03
40 FRONT	52.03	51.17	147.5	3.53E-01	3.38E-02	3.47E-01	3.23E-02
40 BACK	1172.42	55.30	147.5	7.95E+00	8.14E-01	3.75E-01	3.64E-02
41 FRONT	26.85	112.98	147.5	1.82E-01	1.36E-01	7.66E-01	7.24E-02
41 BACK	77.48	109.65	147.5	5.25E-01	1.23E-01	7.43E-01	7.04E-02
43 FRONT	58.73	19.83	147.5	3.98E-01	3.17E-02	1.34E-01	1.38E-02
43 BACK	22.58	18.24	147.5	1.53E-01	2.80E-02	1.24E-01	1.19E-02

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Error (rad/hr)	Gamma Dose Rate (rad/hr)	Error (rad/hr)
44 FRONT	51.91	22.21	147.5	3.52E-01	4.86E-02	1.51E-01	1.52E-02
44 BACK	249.79	21.52	147.5	1.69E+00	7.82E-02	1.46E-01	1.39E-02
45 FRONT	25.82	18.03	1.0	2.58E+01	4.37E+00	1.80E+01	1.73E+00
45 BACK	9.20	17.82	1.0	9.20E+00	3.76E+00	1.78E+01	1.73E+00
46 FRONT	77.90	41.64	147.5	5.28E-01	3.19E-01	2.82E-01	2.82E-02
46 BACK	927.68	39.35	147.5	6.29E+00	3.44E-01	2.67E-01	2.59E-02
48 FRONT	11.84	12.62	147.5	8.02E-02	1.74E-02	8.56E-02	8.14E-03
48 BACK	5.74	11.97	147.5	3.89E-02	2.73E-02	8.11E-02	8.09E-03
49 FRONT	6851.34	1159.49	147.5	4.64E+01	1.48E+01	7.86E+00	1.28E+00
49 BACK	36513.66	899.03	147.5	2.48E+02	2.09E+01	6.09E+00	6.37E-01
50 FRONT	92.94	67.93	147.5	6.30E-01	9.49E-02	4.61E-01	4.35E-02
50 BACK	1645.79	67.25	147.5	1.12E+01	4.71E-01	4.56E-01	4.71E-02
51 FRONT	21.10	18.62	147.5	1.43E-01	2.59E-02	1.26E-01	1.23E-02
51 BACK	4.85	18.32	147.5	3.29E-02	3.72E-02	1.24E-01	1.25E-02
52 FRONT	0.25	0.31	1.0	2.52E-01	6.62E-02	3.10E-01	3.04E-02
52 BACK	0.72	0.30	1.0	7.17E-01	4.40E-02	3.02E-01	2.94E-02
53 FRONT	0.14	0.27	1.0	1.40E-01	5.91E-02	2.69E-01	2.57E-02
53 BACK	0.32	0.25	1.0	3.21E-01	9.96E-02	2.54E-01	2.46E-02
54 FRONT	0.04	0.26	1.0	3.98E-02	3.32E-02	2.62E-01	2.50E-02
54 BACK	0.23	0.27	1.0	2.28E-01	7.18E-02	2.69E-01	2.58E-02
55 FRONT	0.86	0.39	1.0	8.63E-01	7.47E-02	3.93E-01	3.93E-02
55 BACK	0.64	0.36	1.0	6.39E-01	2.46E-01	3.59E-01	3.67E-02
56 FRONT	0.50	0.36	1.0	4.97E-01	1.85E-01	3.57E-01	3.52E-02
56 BACK	0.73	0.36	1.0	7.27E-01	1.32E-01	3.64E-01	3.41E-02
57 FRONT	0.70	0.38	1.0	7.03E-01	4.66E-02	3.79E-01	3.59E-02
57 BACK	1.23	0.39	1.0	1.23E+00	1.88E-01	3.92E-01	3.79E-02

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VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS
VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS
VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS

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S      C      H  H  E
S      C      H  H  E
SSS    C      HHHH  EEEE
S      C      H  H  E
S      C      H  H  E
SSSS  CCCC  H  H  EEEEE

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RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RRRRRRRR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RRRRRRRR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AAAAAAAAAA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AAAAAAAAAA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
RR  RR  AA  AA  TT  II  00  00  00  00  UU  UU  TT
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RR  RR  AA  AA  TT  IIIIII  000000  000000  UUUUUUUUUU  TT

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DD  DD  AA  AA  TT  IIII  22  22
DD  DD  AA  AA  TT  22
DD  DD  AA  AA  TT  22
DD  DD  AA  AA  TT  IIII  22
DD  DD  AA  AA  TT  IIII  22
DD  DD  AAAAAAAAAA  TT  IIII  22
DD  DD  AAAAAAAAAA  TT  IIII  22
DD  DD  AA  AA  TT  II  22
DD  DD  AA  AA  TT  II  22
DDDDDDDD  AA  AA  TT  II  2222222222
DDDDDDDD  AA  AA  TT  II  2222222222

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SSSS  CCCC  H  H  EEEEE
S      C      H  H  E
S      C      H  H  E
SSS    C      HHHH  EEEE
S      C      H  H  E
S      C      H  H  E
SSSS  CCCC  H  H  EEEEE

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VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS
VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS
VAX/VMS SCHE      RATIOOUT 13-JUN-1983 13:39  TTA4: 13-JUN-1983 13:43  DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;2  VAX/VMS

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TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nr)	005" #2 (nr)	010" #3 (nr)	020" #4 (nr)	032" #5 (nr)	064" #6 (nr)	125" #7 (nr)
1 FRONT	Raw 706 50	718 20	675 50	627 10	567 50	576 70	663 90
	Raw 722 80	730 40	755 60	623 20	572 60	530 10	681 10
	Raw 700 70	765 80	813 70	573 80	607 80	563 90	645 20
	Ave 710 00+/- 2%	738 13+/- 3%	748 27+/- 9%	608 03+/- 5%	582 63+/- 4%	556 90+/- 4%	663 40+/- 3%
	Beta 46 60	74 73	84 87	0 00	0 00	0 00	0 00
1 BACK	Raw 698 50	725 50	698 00	540 60	530 70	500 20	663 70
	Raw 674 40	746 20	735 30	576 20	547 30	534 60	677 20
	Raw 695 60	697 00	753 10	547 30	587 00*	577 70	656 90
	Ave 689 50+/- 2%	722 90+/- 3%	728 80+/- 4%	554 70+/- 3%	539 00+/- 2%	537 50+/- 7%	665 93+/- 2%
	Beta 23 57	56 97	62 87	0 00	0 00	0 00	0 00
2 FRONT	Raw 1076 00	749 90	753 60	917 60*	852 30	918 60	774 60
	Raw 1112 00	802 10	784 10	833 40	832 80	907 80	723 80
	Raw 967 60*	777 00	791 00	849 40	835 70	900 00	744 80
	Ave 1094 00+/- 2%	776 33+/- 3%	776 23+/- 3%	841 40+/- 1%	840 27+/- 1%	908 80+/- 1%	747 73+/- 3%
	Beta 346 27	28 60	28 50	93 67	92 53	161 07	0 00
2 BACK	Raw 873 80*	787 20	811 80	883 80	849 10	920 90	821 90
	Raw 1012 00	832 70	760 00	890 40	874 60	898 80	771 50
	Raw 989 90	766 00	862 40	889 80	928 80	948 60	774 60
	Ave 1000 95+/- 2%	795 30+/- 4%	811 40+/- 6%	888 00+/- 0%	884 17+/- 5%	922 77+/- 3%	789 33+/- 4%
	Beta 211 62	5 97	22 07	98 67	94 83	133 43	0 00
3 FRONT	Raw 4913 00	1493 00	1351 00	1385 00	1337 00	1315 00	1223 00
	Raw 6111 00	1502 00	1356 00	1533 00*	1175 00*	1395 00*	1349 00*
	Raw 6827 00	1627 00	1376 00	1352 00	1284 00	1259 00	1235 00
	Ave 5950 33+/- 16%	1540 67+/- 5%	1361 00+/- 1%	1368 50+/- 2%	1310 50+/- 3%	1287 00+/- 3%	1229 00+/- 1%
	Beta 4721 33	311 67	132 00	139 50	81 50	58 00	0 00
3 BACK	Raw 1136 00	1126 00	1090 00	1195 00	1163 00	1138 00	1093 00
	Raw 1173 00	1088 00	1029 00	1121 00	1159 00	1251 00	1109 00
	Raw 1269 00*	1077 00	1043 00	1174 00	974 20*	1183 00	1124 00
	Ave 1154 50+/- 2%	1097 00+/- 2%	1054 00+/- 3%	1163 33+/- 3%	1161 00+/- 0%	1190 67+/- 5%	1108 67+/- 1%
	Beta 45 83	0 00	0 00	54 67	52 33	82 00	0 00

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
4 FRONT	Raw 1363.00 Raw 1404.00 Raw 1371.00	1239.00 1244.00 1217.00	1237.00 1194.00 1282.00	1378.00* 1254.00 1239.00	1247.00 1223.00 1141.00	1276.00 1105.00 1190.00	1118.00 1189.00 1171.00
	Ave 1379.33+/- 2%	1233.33+/- 1%	1237.67+/- 4%	1246.50+/- 1%	1203.67+/- 5%	1190.33+/- 7%	1159.33+/- 3%
	Beta 220.00	74.00	78.33	87.17	44.33	31.00	0.00
	Ratio 1.00	0.3364	0.3561	0.3962	0.2015	0.1409	
4 BACK	Raw 1141.00 Raw 1086.00 Raw 1079.00	1056.00 1121.00 1146.00	1108.00 1050.00 1110.00	1166.00 1153.00 1170.00	1056.00 1112.00 1163.00	1036.00 1190.00 1123.00	1130.00 1041.00* 1172.00
	Ave 1102.00+/- 3%	1107.67+/- 4%	1089.33+/- 3%	1163.00+/- 1%	1110.33+/- 5%	1116.33+/- 7%	1151.00+/- 3%
	Beta 0.00	0.00	0.00	12.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
5 FRONT	Raw 9408.00 Raw 8805.00 Raw 9172.00	10070.00 15070.00* 10000.00	9682.00 12290.00 16010.00	11860.00 12440.00 12250.00	11710.00 11250.00 11520.00	13740.00 13840.00 15070.00*	9390.00 9638.00 9768.00
	Ave 9128.33+/- 3%	10035.00+/- 0%	12660.67+/- 25%	12183.33+/- 2%	11493.33+/- 2%	13790.00+/- 1%	9598.67+/- 2%
	Beta 0.00	436.33	3062.00	2584.67	1894.67	4191.33	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
5 BACK	Raw 11030.00 Raw 11740.00 Raw 10700.00	10870.00 10710.00 13310.00*	10240.00 10780.00 10200.00	11980.00 11980.00 13780.00*	12490.00 10990.00* 11920.00	18770.00 17100.00 17430.00	8962.00 8918.00 9308.00
	Ave 11156.67+/- 5%	10790.00+/- 1%	10406.67+/- 3%	11980.00+/- 0%	12205.00+/- 3%	17766.67+/- 5%	9062.67+/- 2%
	Beta 2094.00	1727.33	1344.00	2917.33	3142.33	8704.00	0.00
	Ratio 1.00	0.8249	0.6418	1.3932	1.5006	4.1566	
6 FRONT	Raw 1311.00 Raw 1143.00* Raw 1268.00	1101.00 1205.00 1275.00	978.20 1085.00 1233.00	1191.00* 1325.00* 1011.00*	1062.00 1060.00 1042.00	1285.00 1111.00* 1233.00	1094.00 1064.00 1113.00
	Ave 1289.50+/- 2%	1193.67+/- 7%	1098.73+/- 12%	0.00+/- 13%	1054.67+/- 1%	1259.00+/- 3%	1090.33+/- 2%
	Beta 199.17	103.33	8.40	0.00	0.00	168.67	0.00
	Ratio 1.00	0.5188	0.0422	0.0000	0.0000	0.8469	
6 BACK	Raw 1221.00 Raw 1390.00 Raw 1550.00	1179.00 1138.00 1085.00	1173.00 1123.00 1060.00*	1167.00 1220.00 1204.00	1050.00 1135.00 1046.00	1283.00 1226.00 1128.00*	949.50* 1141.00 1138.00
	Ave 1387.00+/- 12%	1134.00+/- 4%	1148.00+/- 3%	1197.00+/- 2%	1077.00+/- 5%	1254.50+/- 3%	1139.50+/- 0%
	Beta 247.50	0.00	8.50	57.50	0.00	115.00	0.00
	Ratio 1.00	0.0000	0.0343	0.2323	0.0000	0.4646	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') --- DCH-5-B2

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
7 FRONT	Raw 2084 00	1801 00	1614 00	2760 00	2604 00	2116 00	1771 00
	Raw 2019 00	1687 00	1718 00	2868 00	2443 00	2114 00	1792 00
	Raw 2052 00	1773 00	1661 00	2835 00	2463 00	2046 00	1704 00
	Ave 2051.67+/- 2%	1753.67+/- 3%	1664.33+/- 3%	2887.67+/- 2%	2503.33+/- 4%	2092.00+/- 2%	1755.67+/- 3%
	Beta 296.00	0 00	0 00	1132.00	747.67	336.33	0 00
	Ratio 1 00	0.0000	0.0000	3.8243	2.5259	1.1363	
7 BACK	Raw 6020 00	2312 00	2000 00	2457 00	3435 00*	1946 00	1703 00
	Raw 6077 00	2207 00	2020 00	2518 00	3718 00*	1899 00	1799 00
	Raw 6035 00	2281 00	2013 00	2589 00	4458 00*	1956 00	1647 00
	Ave 6044.00+/- 0%	2266.67+/- 2%	2011.00+/- 1%	2521.33+/- 3%	0.00+/-14%	1933.67+/- 2%	1716.33+/- 4%
	Beta 4327.67	550.33	294.67	805.00	0 00	217.33	0 00
	Ratio 1 00	0.1272	0.0681	0.1860	0.0000	0.0502	
8 FRONT	Raw 670 10	564 70	531 00	472 60	483 60	489 30	509 10
	Raw 560 50*	538 90	660 10	449 90	452 20	480 90	514 20
	Raw 652 10	502 80*	620 00	454 00	494 70	435 10*	503 90
	Ave 661.10+/- 2%	551.80+/- 3%	603.70+/-11%	458.83+/- 3%	476.83+/- 5%	485.10+/- 1%	509.07+/- 1%
	Beta 152.03	42.73	94.63	0 00	0 00	0 00	0 00
	Ratio 1 00	0.2811	0.6225	0.0000	0.0000	0.0000	
8 BACK	Raw 530 90	520 50	508 40	441 10	458 40	563 00*	503 60
	Raw 529 40	526 50	517 50	467 00	514 90*	474 70*	469 50
	Raw 571 00	516 10	480 40	459 10	449 70	518 70*	501 90
	Ave 543.77+/- 4%	521.03+/- 1%	502.10+/- 4%	455.73+/- 3%	454.05+/- 1%	0 00+/- 9%	491.67+/- 4%
	Beta 52.10	29.37	10 43	0 00	0 00	0 00	0 00
	Ratio 1 00	0.5637	0.2003	0.0000	0.0000	0.0000	
11 FRONT	Raw 1212.00*	828 70	992 30	888 90	1154 00	2295 00	1728 00
	Raw 1328 00	849 90	1018 00	936 80	1095 00	1867 00*	1880 00
	Raw 1391 00	843 80	999 00	933 50	1177 00	2321 00	1769 00
	Ave 1359.50+/- 3%	840.80+/- 1%	1003.10+/- 1%	919.73+/- 3%	1142.00+/- 4%	2308.00+/- 1%	1792.33+/- 4%
	Beta 0 00	0 00	0 00	0 00	0 00	515.67	0 00
	Ratio 1 00	0.0000	0.0000	0.0000	0.0000	0.0000	
11 BACK	Raw 1391 00	1026 00	813 60	1213 00	1814 00*	2210 00	1040 00
	Raw 1378 00	1010 00	907 70*	1227 00	1649 00	2581 00*	1095 00
	Raw 1288 00	1035 00	810 60	1127 00	1588 00	2210 00	1013 00
	Ave 1352.33+/- 4%	1023.67+/- 1%	812.10+/- 0%	1189.00+/- 5%	1618.50+/- 3%	2210.00+/- 0%	1049.33+/- 4%
	Beta 303 00	0 00	0 00	137 67	569 17	1160.67	0 00
	Ratio 1 00	0.0000	0.0000	0.4609	1.8784	3.8306	

(* indicates a rejected flier)

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
12 FRONT	Raw 230 70	221 70	202 40	188 50	197 10	182 70	182 70
	Raw 250 20*	212 90	210 10	187 30	201 10	195 20	181 80
	Raw 220 10	220 00	205 90	177 90	181 90*	192 10	172 70
	Ave 225 40+/- 3%	218 20+/- 2%	206 13+/- 2%	184 57+/- 3%	199 10+/- 1%	190 00+/- 3%	179 07+/- 3%
	Beta 46 33	39 13	27 07	5 50	20 03	10 93	0 00
	Ratio 1 00	0 8446	0 5842	0 1187	0 4224	0 2360	
12 BACK	Raw 172 90	186 50	186 90	178 40*	161 70	169 10	171 90
	Raw 194 20*	194 60	181 80	158 90	171 30	179 30	163 00
	Raw 181 00	194 50	184 20	161 90	171 60	165 90	165 10
	Ave 176 95+/- 3%	191 87+/- 2%	184 30+/- 1%	160 40+/- 1%	168 20+/- 3%	171 43+/- 4%	166 67+/- 3%
	Beta 10 28	25 20	17 63	0 00	1 53	4 77	9 00
	Ratio 1 00	2 4506	1 7147	0 0000	0 1491	0 4635	
13 FRONT	Raw 253 90	203 10	229 00	207 90	201 30	199 50	174 20*
	Raw 249 00	255 40	230 70	219 80	179 80*	200 10	193 70
	Raw 238 10	228 30	245 70	212 10	201 50	202 00	201 90
	Ave 247 00+/- 3%	228 93+/- 11%	235 13+/- 4%	213 27+/- 3%	201 40+/- 0%	200 53+/- 1%	197 80+/- 3%
	Beta 49 20	31 13	37 33	15 47	3 60	2 73	0 00
	Ratio 1 00	0 6328	0 7588	0 3144	0 0732	0 0556	
13 BACK	Raw 197 60	187 10*	200 40	184 90	167 50	189 10	184 80
	Raw 202 80	212 70	189 80	189 50	183 80*	194 20	186 10
	Raw 216 00	205 00	214 10	186 10	170 10	183 60	197 80
	Ave 205 47+/- 5%	208 85+/- 3%	201 43+/- 6%	186 83+/- 1%	168 80+/- 1%	188 97+/- 3%	189 57+/- 4%
	Beta 15 90	19 28	11 87	0 00	0 00	0 00	0 00
	Ratio 1 00	1 2128	0 7463	0 0000	0 0000	0 0000	
14 FRONT	Raw 367 60	250 40	219 80*	240 40	204 70	215 40	191 60*
	Raw 357 30	261 70	250 80	210 30	218 90	206 70	219 90
	Raw 378 50	259 30	251 90	223 30	203 80	221 40	212 00
	Ave 367 80+/- 3%	257 13+/- 2%	251 35+/- 0%	224 67+/- 7%	209 13+/- 4%	214 50+/- 3%	215 95+/- 3%
	Beta 151 85	41 18	35 40	8 72	0 00	0 00	0 00
	Ratio 1 00	0 2712	0 2331	0 0574	0 0000	0 0000	
14 BACK	Raw 219 30	214 00	214 80	205 90	187 90	202 30	191 50
	Raw 236 00	210 40	186 80*	189 90	194 30	203 30	189 50
	Raw 234 30	206 70	205 60	194 10	199 40	202 80	201 60
	Ave 229 87+/- 4%	210 37+/- 2%	210 20+/- 3%	196 63+/- 4%	193 87+/- 3%	202 80+/- 0%	194 20+/- 3%
	Beta 35 67	16 17	16 00	2 43	0 00	8 60	0 00
	Ratio 1 00	0 4533	0 4486	0 0682	0 0000	0 2411	

(* indicates a rejected flier)

MI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
15 FRONT	Raw 123.50 Raw 132.90* Raw 120.20 Ave 121.85+/- 2% Beta 13.65 Ratio 1.00	130.40 123.10 126.90 126.80+/- 3% 18.60 1.3626	116.20 110.30 121.80 116.10+/- 5% 7.90 0.5788	119.60 121.70 123.10 121.47+/- 1% 13.27 0.9719	104.20 103.10 110.40 105.90+/- 4% 0.00 0.0000	96.64 111.10 103.80 103.85+/- 7% 0.00 0.0000	112.40 106.00 106.20 108.20+/- 3% 0.00
15 BACK	Raw 118.80 Raw 105.70* Raw 123.60 Ave 121.20+/- 3% Beta 18.17 Ratio 1.00	99.01 92.28 106.20 99.16+/- 7% 0.00 0.0000	99.98 100.20 94.10 98.09+/- 4% 0.00 0.0000	106.40 98.16 105.50 103.35+/- 4% 0.32 0.0176	105.70 94.45 99.77 99.97+/- 6% 0.00 0.0000	95.63 94.50 92.70 94.28+/- 2% 0.00 0.0000	103.40 100.30 105.40 103.03+/- 2% 0.00
17 FRONT	Raw 4.08 Raw 3.53* Raw 4.01 Ave 4.05+/- 1% Beta 1.48 Ratio 1.00	2.97 2.65* 2.84 2.91+/- 3% 0.34 0.2273	2.84 2.96 2.91 2.90+/- 2% 0.33 0.2259	3.05 2.76* 3.12 3.09+/- 2% 0.52 0.3507	2.56 2.91 2.77 2.75+/- 6% 0.18 0.1193	2.78 2.86 2.34* 2.82+/- 2% 0.25 0.1676	2.58 2.48 2.65 2.57+/- 3% 0.00
17 BACK	Raw 4.13 Raw 4.11 Raw 3.98 Ave 4.07+/- 2% Beta 1.50 Ratio 1.00	3.12 3.17 3.46* 3.15+/- 1% 0.57 0.3816	2.97 3.04 2.66* 3.00+/- 2% 0.43 0.2867	2.56 2.76 2.71 2.68+/- 4% 0.10 0.0695	2.78 2.82 2.53* 2.80+/- 1% 0.23 0.1505	2.53 2.44 2.42 2.47+/- 2% 0.00 0.0000	2.63 2.53 2.56 2.57+/- 2% 0.00
18 FRONT	Raw 262.10 Raw 260.30 Raw 198.60* Ave 261.20+/- 0% Beta 100.70 Ratio 1.00	197.80 197.70 179.10* 197.75+/- 0% 37.25 0.3699	176.70 184.00 195.80* 180.35+/- 3% 19.85 0.1971	179.80 174.70 176.60 177.03+/- 1% 16.53 0.1642	137.90 165.40 165.90 163.07+/- 3% 2.57 0.0255	168.00* 151.00 157.20 154.10+/- 3% 0.00 0.0000	158.10 159.90 163.50 160.50+/- 2% 0.00
18 BACK	Raw 152.60* Raw 198.40 Raw 191.30 Ave 194.85+/- 3% Beta 58.70 Ratio 1.00	171.00* 144.40 145.40 144.90+/- 0% 8.75 0.1491	164.00 173.50 175.60 171.03+/- 4% 34.88 0.5943	139.60 143.50 139.60 140.90+/- 2% 4.75 0.0809	141.70* 158.90 159.30 159.10+/- 0% 22.95 0.3910	141.30 139.90 139.00 140.07+/- 1% 3.92 0.0667	136.10 136.20 154.70* 136.15+/- 0% 0.00

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
19 FRONT	Raw 176.40 Raw 174.10 Raw 197.70*	182.50 178.00 183.30	175.30 174.20 175.10	144.40 144.80 142.30	167.40* 151.40 144.50	128.50 130.40 130.20	152.00 151.60 144.20
	Ave 175.25+/- 1%	181.27+/- 2%	174.87+/- 0%	143.83+/- 1%	147.95+/- 3%	129.70+/- 1%	149.27+/- 3%
	Beta 25.98	32.00	25.60	0.00	0.00	0.00	0.00
	Ratio 1.00	1.2316	0.9852	0.0000	0.0000	0.0000	0.0000
19 BACK	Raw 123.60 Raw 126.10 Raw 125.80	139.50 147.80 148.70	156.10 150.90 149.00	128.40 127.10 136.80	118.70* 132.40 126.10	118.90 120.00 121.40	158.70 136.00* 157.90
	Ave 125.17+/- 1%	145.33+/- 3%	152.00+/- 2%	130.77+/- 4%	129.25+/- 3%	120.10+/- 1%	158.30+/- 0%
	Beta 0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21 FRONT	Raw 0.89 Raw 0.90 Raw 0.89	0.82 0.97* 0.83	1.06 1.07 1.02	0.88 0.87 0.87	0.90 0.83 0.86	1.02 0.97 1.03	1.04 1.04 1.04
	Ave 0.89+/- 1%	0.83+/- 1%	1.05+/- 3%	0.87+/- 1%	0.86+/- 4%	1.00+/- 3%	1.04+/- 0%
	Beta 0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21 BACK	Raw 1.02 Raw 1.06 Raw 1.02	0.93 0.93 0.98	1.05 1.10 1.08	0.94 1.05* 0.94	0.95 0.97 1.04	0.95 1.05* 0.94	0.90 0.93 0.92
	Ave 1.03+/- 2%	0.95+/- 3%	1.08+/- 2%	0.94+/- 0%	0.99+/- 5%	0.94+/- 1%	0.92+/- 1%
	Beta 0.11	0.03	0.16	0.03	0.07	0.03	0.00
	Ratio 1.00	0.2870	1.4000	0.2406	0.6000	0.2406	0.0000
33 FRONT	Raw 336.30 Raw 344.60 Raw 330.40	0.00 0.00 0.00	0.00 0.00 0.00	214.60 204.60 229.20*	200.30 207.90 205.60	0.00 0.00 0.00	205.70 183.40* 202.70
	Ave 337.10+/- 2%	0.00+/- 0%	0.00+/- 0%	209.60+/- 3%	204.60+/- 2%	0.00+/- 0%	204.20+/- 1%
	Beta 132.90	0.00	0.00	5.40	0.40	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0406	0.0030	0.0000	0.0000
33 BACK	Raw 207.40 Raw 204.10 Raw 219.20	0.00 0.00 0.00	0.00 0.00 0.00	197.70 193.10 195.70	180.10 178.50 166.60	0.00 0.00 0.00	170.90 188.50* 171.70
	Ave 210.23+/- 4%	0.00+/- 0%	0.00+/- 0%	195.50+/- 1%	175.07+/- 4%	0.00+/- 0%	171.30+/- 0%
	Beta 38.93	0.00	0.00	24.20	3.77	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.6216	0.0967	0.0000	0.0000

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
58 FRONT	Raw 973.30 Raw 1029.00 Raw 894.10 Ave 965.47 +/- 7% Beta 49.13 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	931.40 919.90 926.30 926.03 +/- 1% 9.70 0.1974	990.20 917.40 927.50 945.03 +/- 4% 28.70 0.5841	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	913.10 898.70 937.20 916.33 +/- 2% 0.00 0.00
58 BACK	Raw 971.50* Raw 1086.00 Raw 1048.00 Ave 1067.00 +/- 3% Beta 172.20 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	922.00 893.40 903.30 906.23 +/- 2% 11.43 0.0664	825.20* 908.30 909.20 908.75 +/- 0% 13.95 0.0810	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	909.30 876.40 898.70 894.80 +/- 2% 0.00 0.00
59 FRONT	Raw 1.06 Raw 1.07 Raw 1.03 Ave 1.05 +/- 2% Beta 0.08 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.96 0.96 0.99 0.97 +/- 2% 0.00 0.0000	0.94 0.92 0.98 0.95 +/- 4% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.96 0.93 1.02 0.97 +/- 4% 0.00 0.00
59 BACK	Raw 1.01 Raw 0.98 Raw 0.99 Ave 0.99 +/- 2% Beta 0.06 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.95 0.92 0.99 0.95 +/- 4% 0.01 0.2558	0.90 0.95 0.96 0.93 +/- 3% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.95 1.02 0.84 0.94 +/- 10% 0.00 0.00
61 FRONT	Raw 2657.00 Raw 2508.00 Raw 2690.00 Ave 2618.33 +/- 4% Beta 0.00 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	2444.00 2418.00 2570.00 2477.33 +/- 3% 0.00 0.0000	2670.00 2716.00 2674.00 2686.67 +/- 1% 58.67 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	2369.00* 2583.00 2673.00 2628.00 +/- 2% 0.00 0.00
61 BACK	Raw 2694.00 Raw 2694.00 Raw 2624.00 Ave 2670.67 +/- 2% Beta 320.00 Ratio 1.00	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	2466.00 2621.00 2615.00 2567.33 +/- 3% 216.67 0.6771	2225.00 2275.00 2314.00 2271.33 +/- 2% 0.00 0.0000	0.00 0.00 0.00 0.00 +/- 0% 0.00 0.0000	2278.00 2400.00 2374.00 2350.67 +/- 3% 0.00 0.00

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
63 FRONT	Raw 652.90	0.00	0.00	415.90	385.60	0.00	368.70
	Raw 646.90	0.00	0.00	418.00	412.70	0.00	396.50
	Raw 617.10	0.00	0.00	401.00	395.50	0.00	401.60
	Ave 638.97+/- 3%	0.00+/- 0%	0.00+/- 0%	411.63+/- 2%	397.93+/- 3%	0.00+/- 0%	388.93+/- 5%
	Beta 250.03	0.00	0.00	22.70	9.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0908	0.0360	0.0000	
63 BACK	Raw 819.80	0.00	0.00	434.00	369.00	0.00	342.40
	Raw 753.20	0.00	0.00	466.60	369.00	0.00	368.20
	Raw 774.10	0.00	0.00	473.20	367.80	0.00	369.30
	Ave 782.37+/- 4%	0.00+/- 0%	0.00+/- 0%	457.93+/- 5%	368.60+/- 0%	0.00+/- 0%	359.97+/- 4%
	Beta 422.40	0.00	0.00	97.97	8.63	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2319	0.0204	0.0000	
64 FRONT	Raw 761.40	0.00	0.00	720.00	654.50	0.00	656.80
	Raw 779.60	0.00	0.00	700.70	690.50	0.00	613.70
	Raw 731.30	0.00	0.00	721.20	667.80	0.00	648.10
	Ave 757.43+/- 3%	0.00+/- 0%	0.00+/- 0%	713.97+/- 2%	670.93+/- 3%	0.00+/- 0%	639.53+/- 4%
	Beta 117.90	0.00	0.00	74.43	31.40	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.6313	0.2663	0.0000	
64 BACK	Raw 651.70	0.00	0.00	607.40	618.40	0.00	622.50
	Raw 656.00	0.00	0.00	597.30	606.90	0.00	668.30
	Raw 647.40	0.00	0.00	667.00*	617.80	0.00	608.10
	Ave 651.70+/- 1%	0.00+/- 0%	0.00+/- 0%	602.35+/- 1%	614.37+/- 1%	0.00+/- 0%	632.97+/- 5%
	Beta 18.73	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
65 FRONT	Raw 1294.00	0.00	0.00	917.50	890.50	0.00	861.50
	Raw 1251.00	0.00	0.00	927.30	923.80	0.00	824.30
	Raw 1290.00	0.00	0.00	894.90	847.20	0.00	894.30
	Ave 1278.33+/- 2%	0.00+/- 0%	0.00+/- 0%	913.23+/- 2%	887.17+/- 4%	0.00+/- 0%	860.03+/- 4%
	Beta 418.30	0.00	0.00	53.20	27.13	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1272	0.0649	0.0000	
65 BACK	Raw 1188.00	0.00	0.00	897.30	889.10	0.00	881.70
	Raw 1133.00	0.00	0.00	913.20	869.00	0.00	924.80
	Raw 1163.00	0.00	0.00	851.90	873.50	0.00	899.90
	Ave 1161.33+/- 2%	0.00+/- 0%	0.00+/- 0%	887.47+/- 4%	877.20+/- 1%	0.00+/- 0%	902.13+/- 2%
	Beta 259.20	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
66 FRONT	Raw 1023.00	0.00	0.00	842.90*	896.10	0.00	879.30
	Raw 992.40	0.00	0.00	943.60	885.60	0.00	921.90
	Raw 1901.00*	0.00	0.00	932.80	880.60	0.00	908.30
	Ave 1007.70 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	938.20 +/- 1%	887.43 +/- 1%	0.00 +/- 0%	903.17 +/- 2%
	Beta 104.53	0.00	0.00	35.03	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3351	0.0000	0.0000	
66 BACK	Raw 1426.00	0.00	0.00	803.40	847.30	0.00	814.70
	Raw 1494.00	0.00	0.00	973.70*	857.80	0.00	839.60
	Raw 1453.00	0.00	0.00	808.30	898.50	0.00	820.00
	Ave 1458.33 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	805.85 +/- 0%	867.87 +/- 3%	0.00 +/- 0%	824.77 +/- 2%
	Beta 633.57	0.00	0.00	0.00	43.10	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0680	0.0000	
67 FRONT	Raw 247.40*	0.00	0.00	211.90	226.80*	0.00	208.60
	Raw 284.30	0.00	0.00	218.60	208.10	0.00	210.00
	Raw 292.10	0.00	0.00	119.60	204.30	0.00	203.70
	Ave 288.20 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	216.70 +/- 2%	206.20 +/- 1%	0.00 +/- 0%	207.43 +/- 2%
	Beta 80.77	0.00	0.00	9.27	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1147	0.0000	0.0000	
67 BACK	Raw 234.30*	0.00	0.00	212.40	201.50	0.00	206.60
	Raw 260.90	0.00	0.00	212.00	197.40	0.00	199.60
	Raw 250.40	0.00	0.00	206.30	198.10	0.00	197.70
	Ave 255.65 +/- 3%	0.00 +/- 0%	0.00 +/- 0%	210.23 +/- 2%	199.00 +/- 1%	0.00 +/- 0%	201.30 +/- 2%
	Beta 54.35	0.00	0.00	8.93	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1644	0.0000	0.0000	
68 FRONT	Raw 384.20	0.00	0.00	307.60	308.00	0.00	295.70
	Raw 359.20	0.00	0.00	281.00	294.20	0.00	299.60
	Raw 359.20	0.00	0.00	297.90	301.50	0.00	302.20
	Ave 367.53 +/- 4%	0.00 +/- 0%	0.00 +/- 0%	295.50 +/- 5%	301.23 +/- 2%	0.00 +/- 0%	299.17 +/- 1%
	Beta 68.37	0.00	0.00	0.00	2.07	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0302	0.0000	
68 BACK	Raw 668.10	0.00	0.00	313.80	287.10	0.00	275.50
	Raw 675.90	0.00	0.00	326.50	303.90	0.00	281.00
	Raw 679.90	0.00	0.00	319.00	293.60	0.00	282.60
	Ave 674.63 +/- 1%	0.00 +/- 0%	0.00 +/- 0%	319.77 +/- 2%	294.87 +/- 3%	0.00 +/- 0%	279.70 +/- 1%
	Beta 394.93	0.00	0.00	40.07	15.17	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1015	0.0384	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	125" #7 (nc)
70 FRONT	Raw 668.20 Raw 653.40 Raw 634.10 Ave 651.90+/- 3% Beta 114.40 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	527.40 509.60 502.70 513.23+/- 2% 0.00 0.0000	512.90 520.10 495.90 509.63+/- 2% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	535.40 504.90 542.20 537.50+/- 1% 0.00 0.0000
70 BACK	Raw 1276.00 Raw 2968.00 Raw 3233.00 Ave 2492.33+/-43% Beta 1810.37 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	687.00 649.20 674.80 670.33+/- 3% 0.00 0.0000	742.40* 818.80* 677.10* 0.00+/-10% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	717.80 664.40 663.70 681.97+/- 5% 0.00 0.0000
71 FRONT	Raw 832.10 Raw 811.30 Raw 846.90 Ave 830.10+/- 2% Beta 180.17 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	656.80 650.30 692.80 666.63+/- 3% 16.70 0.0927	668.60 682.60 695.80 682.33+/- 2% 32.40 0.1798	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	629.50 659.70 650.60 649.93+/- 3% 0.00 0.0000
71 BACK	Raw 4490.00 Raw 4197.00 Raw 4382.00 Ave 4356.33+/- 3% Beta 3622.67 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	1014.00 1028.00 1021.00 1021.00+/- 1% 287.33 0.0793	929.30 918.00 915.80 921.03+/- 1% 187.37 0.0517	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	730.90 742.40 727.70 733.67+/- 1% 0.00 0.0000
72 FRONT	Raw 1926.00 Raw 1834.00 Raw 1987.00 Ave 1915.67+/- 4% Beta 218.00 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	1866.00 1813.00 1843.00 1840.67+/- 1% 143.00 0.6560	1871.00 1874.00 1680.00* 1872.50+/- 0% 174.83 0.8020	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	1700.00 1708.00 1685.00 1697.67+/- 1% 0.00 0.0000
72 BACK	Raw 2115.00 Raw 2199.00 Raw 2189.00 Ave 2167.67+/- 2% Beta 358.33 Ratio 1.00	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	1758.00 1778.00 1780.00 1772.00+/- 1% 0.00 0.0000	1772.00 1628.00 1743.00 1714.33+/- 4% 0.00 0.0000	0.00 0.00 0.00 0.00+/- 0% 0.00 0.0000	1782.00 1851.00 1795.00 1809.33+/- 2% 0.00 0.0000

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
73 FRONT	Raw 543 50	0 00	0 00	396 60	354 10	0 00	351 00
	Raw 545 30	0 00	0 00	425 90	379 00	0 00	342 50
	Raw 540 30	0 00	0 00	397 20	365 00	0 00	333 90
	Ave 543.03+/- 0%	0.00+/- 0%	0.00+/- 0%	406.90+/- 4%	366.03+/- 3%	0.00+/- 0%	342.47+/- 2%
	Beta 200 57	0 00	0 00	64 43	23 57	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.3213	0.1175	0.0000	
73 BACK	Raw 356 30	0 00	0 00	338 60	333 40*	0 00	348 50
	Raw 362 60	0 00	0 00	342 50	359 50	0 00	344 00
	Raw 357 30	0 00	0 00	339 30	367 30	0 00	341 20
	Ave 358.73+/- 1%	0.00+/- 0%	0.00+/- 0%	340.13+/- 1%	363.40+/- 2%	0.00+/- 0%	344.57+/- 1%
	Beta 14 17	0 00	0 00	0 00	18 83	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.0000	1.3294	0.0000	
74 FRONT	Raw 380.10*	0 00	0 00	223 40	212 80	0 00	219 40
	Raw 337 10	0 00	0 00	219 60	231 80	0 00	220 60
	Raw 342 20	0 00	0 00	229 10	247 90	0 00	231 80
	Ave 339.65+/- 1%	0.00+/- 0%	0.00+/- 0%	224.03+/- 2%	230.83+/- 8%	0.00+/- 0%	223.93+/- 3%
	Beta 115 72	0 00	0 00	0 10	6 90	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.0009	0.0596	0.0000	
74 BACK	Raw 918 70	0 00	0 00	270 90	268 10	0 00	228 00
	Raw 848 10	0 00	0 00	284 80	239 20*	0 00	213 70
	Raw 916 80	0 00	0 00	305 80*	255 30	0 00	229 10
	Ave 894.53+/- 4%	0.00+/- 0%	0.00+/- 0%	277.85+/- 4%	261.70+/- 3%	0.00+/- 0%	223.60+/- 4%
	Beta 670 93	0 00	0 00	54 25	38 10	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.0809	0.0568	0.0000	
75 FRONT	Raw 284 90	0 00	0 00	229 90	235 30	0 00	213 80
	Raw 272 80	0 00	0 00	240 30	237 20	0 00	224 00
	Raw 280 70	0 00	0 00	225 00	235 90	0 00	225 70
	Ave 279.47+/- 2%	0.00+/- 0%	0.00+/- 0%	231.73+/- 3%	236.13+/- 0%	0.00+/- 0%	221.17+/- 3%
	Beta 58 30	0 00	0 00	10 57	14 97	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.1812	0.2567	0.0000	
75 BACK	Raw 224 20	0 00	0 00	215 50	213 70	0 00	227 30
	Raw 226 10	0 00	0 00	190.00*	223 30	0 00	215 00
	Raw 229 20	0 00	0 00	218 10	231 50	0 00	226 50
	Ave 226.50+/- 1%	0.00+/- 0%	0.00+/- 0%	216.80+/- 1%	222.83+/- 4%	0.00+/- 0%	222.93+/- 3%
	Beta 3 57	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
76 FRONT	Raw 309 20	0 00	0 00	258 10	246 70	0 00	243 10
	Raw 305 20	0 00	0 00	258 60	249 20	0 00	238 90
	Raw 306 10	0 00	0 00	262 90	246 70	0 00	243 10
	Ave 306 83+/- 1%	0 00+/- 0%	0 00+/- 0%	259 87+/- 1%	247 53+/- 1%	0 00+/- 0%	241 70+/- 1%
	Beta 65 13	0 00	0 00	18 17	5 83	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2789	0 0896	0 0000	
76 BACK	Raw 242 60	0 00	0 00	219 10	236 70	0 00	241 80
	Raw 254 20	0 00	0 00	218 80	248 00	0 00	244 90
	Raw 273 80*	0 00	0 00	217 20	239 50	0 00	248 20
	Ave 248 40+/- 3%	0 00+/- 0%	0 00+/- 0%	218 37+/- 0%	241 40+/- 2%	0 00+/- 0%	244 97+/- 1%
	Beta 3 43	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
77 FRONT	Raw 376 20	0 00	0 00	348 90	351 30	0 00	338 90
	Raw 391 80	0 00	0 00	354 90	318 20*	0 00	341 20
	Raw 418 00*	0 00	0 00	355 90	348 20	0 00	351 80
	Ave 384 00+/- 3%	0 00+/- 0%	0 00+/- 0%	353 23+/- 1%	349 75+/- 1%	0 00+/- 0%	343 97+/- 2%
	Beta 40 03	0 00	0 00	9 27	5 78	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2315	0 1445	0 0000	
77 BACK	Raw 348 60*	0 00	0 00	346 40	347 00	0 00	316 20
	Raw 413 80	0 00	0 00	372 90	334 70	0 00	304 50
	Raw 398 40	0 00	0 00	343 20	330 40	0 00	307 30
	Ave 406 10+/- 3%	0 00+/- 0%	0 00+/- 0%	354 17+/- 5%	337 37+/- 3%	0 00+/- 0%	309 33+/- 2%
	Beta 96 77	0 00	0 00	44 83	28 03	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 4633	0 2897	0 0000	
78 FRONT	Raw 522 90	0 00	0 00	437 70	407 80	0 00	394 10
	Raw 582 80*	0 00	0 00	449 90	432 40	0 00	397 80
	Raw 523 30	0 00	0 00	462 70	403 10	0 00	420 70
	Ave 523 10+/- 0%	0 00+/- 0%	0 00+/- 0%	450 10+/- 3%	414 43+/- 4%	0 00+/- 0%	404 20+/- 4%
	Beta 118 90	0 00	0 00	45 90	10 23	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 3860	0 0861	0 0000	
78 BACK	Raw 1296 00	0 00	0 00	456 80	532 80	0 00	434 60
	Raw 1377 00	0 00	0 00	479 50	504 50	0 00	424 70
	Raw 1494 00	0 00	0 00	489 00	524 10	0 00	444 90
	Ave 1387 00+/- 7%	0 00+/- 0%	0 00+/- 0%	475 10+/- 3%	520 47+/- 3%	0 00+/- 0%	434 73+/- 2%
	Beta 954 27	0 00	0 00	40 37	85 73	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0423	0 0878	0 0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
80 FRONT	Raw 194 40	0 00	0 00	174 80	172 90	0 00	148 20*
	Raw 202 10	0 00	0 00	164 70	171 10	0 00	164 00
	Raw 204 10	0 00	0 00	166 30	164 50	0 00	165 80
	Ave 200 20+/- 3%	0 00+/- 0%	0 00+/- 0%	168 60+/- 3%	169 50+/- 3%	0 00+/- 0%	164 90+/- 1%
	Beta 35 30	0 00	0 00	3 70	4 60	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1048	0 1303	0 0000	
80 BACK	Raw 175 00	0 00	0 00	160 50	158 90	0 00	165 50
	Raw 177 00	0 00	0 00	148 20	168 10	0 00	156 50
	Raw 176 70	0 00	0 00	157 10	153 50	0 00	158 90
	Ave 176 23+/- 1%	0 00+/- 0%	0 00+/- 0%	155 27+/- 4%	160 17+/- 5%	0 00+/- 0%	160 30+/- 3%
	Beta 15 93	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
98 FRONT	Raw 1 65	0 00	0 00	1 54*	1 49	0 00	1 54
	Raw 1 67	0 00	0 00	1 39	1 50	0 00	1 53
	Raw 1 76	0 00	0 00	1 44	1 47	0 00	1 53
	Ave 1 69+/- 3%	0 00+/- 0%	0 00+/- 0%	1 4+/- 2%	1 49+/- 1%	0 00+/- 0%	1 53+/- 1%
	Beta 0 16	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
98 BACK	Raw 1 75	0 00	0 00	1 46	1 53	0 00	1 56
	Raw 1 79	0 00	0 00	1 59	1 50	0 00	1 60
	Raw 1 74	0 00	0 00	1 51	1 58	0 00	1 50
	Ave 1 76+/- 2%	0 00+/- 0%	0 00+/- 0%	1 52+/- 4%	1 53+/- 3%	0 00+/- 0%	1 55+/- 3%
	Beta 0 21	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
99 FRONT	Raw 2 84	0 00	0 00	2 38	2 42	0 00	2 46
	Raw 2 88	0 00	0 00	2 40	2 33	0 00	2 39
	Raw 2 87	0 00	0 00	2 50	2 44	0 00	2 35
	Ave 2 86+/- 1%	0 00+/- 0%	0 00+/- 0%	2 43+/- 3%	2 39+/- 2%	0 00+/- 0%	2 40+/- 2%
	Beta 0 46	0 00	0 00	0 03	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0552	0 0000	0 0000	
99 BACK	Raw 3 04*	0 00	0 00	2 48	2 58	0 00	2 36
	Raw 3 37	0 00	0 00	2 49	2 56	0 00	2 44
	Raw 3 27	0 00	0 00	2 50	2 53	0 00	2 37
	Ave 3 32+/- 2%	0 00+/- 0%	0 00+/- 0%	2 49+/- 0%	2 56+/- 1%	0 00+/- 0%	2 39+/- 2%
	Beta 0 93	0 00	0 00	0 10	0 17	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1032	0 1863	0 0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

*** RESULTS ***

CALCULATED DOSES

Dosimeter	Calibration Factors						Mylar Chip Reading (nc)	Calculated Beta		Calculated Gamma	
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave. (rad/nc)		Dose (rad)	Error (rad)	Dose (rad)	Error (rad)
1 FRONT	0.22	0.22	0.00	0.00	0.00	0.22	46.60	10.16	4.64	135.13	13.09
1 BACK	0.22	0.22	0.00	0.00	0.00	0.22	23.57	5.14	3.65	135.65	12.79
2 FRONT	0.91	0.86	0.00	0.29	0.22	0.57	346.27	197.12	128.21	152.31	15.09
2 BACK	0.97	0.83	0.26	0.22	0.22	0.50	211.62	105.42	79.86	160.79	16.02
3 FRONT	0.93	0.92	0.00	0.00	0.00	0.92	4721.33	4354.33	892.77	250.35	23.35
3 BACK	0.99	0.95	0.22	0.22	0.22	0.52	45.83	23.79	24.63	225.84	21.24
4 FRONT	0.66	0.56	0.31	0.36	0.22	0.42	220.00	92.57	43.74	236.16	23.21
4 BACK	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	234.46	22.63
5 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	1955.25	186.00
5 BACK	0.22	0.24	0.22	0.22	0.22	0.22	2094.00	467.23	130.04	1846.07	177.11
6 FRONT	0.47	0.90	0.00	0.00	0.22	0.53	199.17	105.74	71.79	222.10	21.26
6 BACK	0.99	0.91	0.00	0.00	0.22	0.71	247.50	175.05	157.00	232.12	21.59
7 FRONT	0.99	0.95	0.22	0.22	0.22	0.52	296.00	153.65	125.58	357.63	34.55
7 BACK	0.87	0.87	0.00	0.00	0.31	0.68	4327.67	2959.21	1393.99	349.62	36.09
8 FRONT	0.71	0.26	0.00	0.00	0.00	0.49	152.03	74.28	48.57	103.70	9.70
8 BACK	0.43	0.73	0.00	0.00	0.00	0.58	52.10	30.13	20.76	100.15	10.10
11 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	365.10	37.54
11 BACK	0.99	0.95	0.26	0.22	0.22	0.53	303.00	159.82	128.23	213.75	21.62
12 FRONT	0.22	0.31	0.00	0.22	0.22	0.24	46.33	11.13	3.04	36.48	3.57
12 BACK	0.22	0.22	0.00	0.00	0.22	0.22	10.28	2.24	1.61	33.95	3.30
13 FRONT	0.36	0.22	0.37	0.00	0.28	0.31	49.20	15.08	4.65	40.29	3.93
13 BACK	0.22	0.22	0.00	0.00	0.00	0.22	15.90	3.47	2.59	38.61	3.88
14 FRONT	0.72	0.69	0.00	0.00	0.00	0.71	151.85	107.34	9.09	43.99	4.25
14 BACK	0.54	0.46	0.00	0.00	0.22	0.40	35.67	14.42	7.49	39.56	3.91
15 FRONT	0.22	0.31	0.22	0.00	0.00	0.25	13.65	3.41	1.31	22.04	2.18
15 BACK	0.99	0.95	0.00	0.00	0.00	0.97	18.17	17.63	4.18	20.99	2.02
17 FRONT	0.77	0.70	0.34	0.00	0.22	0.51	1.48	0.75	0.40	0.52	0.05
17 BACK	0.61	0.63	0.00	0.00	0.00	0.62	1.50	0.93	0.07	0.52	0.05
18 FRONT	0.62	0.73	0.00	0.00	0.00	0.68	100.70	68.19	7.95	32.69	3.09
18 BACK	0.84	0.30	0.00	0.22	0.22	0.39	58.70	23.14	17.88	27.73	2.58
19 FRONT	0.22	0.22	0.00	0.00	0.00	0.22	25.98	5.66	1.02	30.41	2.97
19 BACK	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	32.25	3.00

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** RESULTS ***

CALCULATED DOSES

Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Beta Error (rad)	Calculated Gamma Dose (rad)	Gamma Error (rad)
21 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.21	0.02
21 BACK	0.71	0.22	0.00	0.22	0.22	0.34	0.11	0.04	0.03	0.19	0.02
33 FRONT	0.00	0.00	0.57	0.59	0.00	0.58	132.90	76.93	4.47	41.60	3.89
33 BACK	0.00	0.00	0.22	0.48	0.00	0.35	38.93	13.60	7.75	34.89	3.25
58 FRONT	0.00	0.00	0.46	0.22	0.00	0.34	49.13	16.56	25.16	186.66	17.81
58 BACK	0.00	0.00	0.55	0.50	0.00	0.53	172.20	90.55	17.96	182.27	17.29
59 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.08	0.05	0.03	0.20	0.02
59 BACK	0.00	0.00	0.41	0.59	0.00	0.50	0.06	0.03	0.05	0.19	0.03
61 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.00	0.00	0.00	535.32	51.45
61 BACK	0.00	0.00	0.22	0.59	0.00	0.40	320.00	129.04	89.25	478.83	46.42
63 FRONT	0.00	0.00	0.54	0.55	0.00	0.54	250.03	135.48	14.33	79.23	8.20
63 BACK	0.00	0.00	0.43	0.57	0.00	0.50	422.40	210.36	44.51	73.33	7.49
64 FRONT	0.00	0.00	0.22	0.29	0.00	0.25	117.90	30.05	10.50	130.27	12.97
64 BACK	0.00	0.00	0.60	0.59	0.00	0.60	18.73	11.16	18.90	128.94	13.59
65 FRONT	0.00	0.00	0.51	0.52	0.00	0.51	418.30	214.26	21.81	175.19	17.79
65 BACK	0.00	0.00	0.60	0.59	0.00	0.60	259.20	154.39	21.02	183.76	17.65
66 FRONT	0.00	0.00	0.35	0.59	0.00	0.47	104.53	49.24	22.60	183.98	17.67
66 BACK	0.00	0.00	0.60	0.51	0.00	0.56	633.57	353.37	45.03	168.00	15.85
67 FRONT	0.00	0.00	0.52	0.59	0.00	0.55	80.77	44.66	5.40	42.25	3.99
67 BACK	0.00	0.00	0.48	0.59	0.00	0.53	54.35	29.05	6.26	41.00	3.93
68 FRONT	0.00	0.00	0.60	0.55	0.00	0.58	68.37	39.57	8.87	60.94	5.71
68 BACK	0.00	0.00	0.53	0.55	0.00	0.54	394.93	211.89	6.38	56.97	5.35
70 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	114.40	68.14	10.53	109.49	10.22
70 BACK	0.00	0.00	0.60	0.59	0.00	0.60	1810.37	1078.34	632.92	138.92	14.38
71 FRONT	0.00	0.00	0.53	0.39	0.00	0.46	180.17	83.06	22.33	132.39	12.98
71 BACK	0.00	0.00	0.54	0.53	0.00	0.54	3622.67	1946.60	86.34	149.45	13.99
72 FRONT	0.00	0.00	0.22	0.22	0.00	0.22	218.00	47.52	16.98	345.81	32.25
72 BACK	0.00	0.00	0.60	0.59	0.00	0.60	358.33	213.44	35.17	368.56	35.08
73 FRONT	0.00	0.00	0.36	0.46	0.00	0.41	200.57	82.38	13.79	69.76	6.72
73 BACK	0.00	0.00	0.60	0.22	0.00	0.41	14.17	5.81	4.37	70.19	6.57
74 FRONT	0.00	0.00	0.60	0.52	0.00	0.56	115.72	65.05	7.86	45.62	4.47
74 BACK	0.00	0.00	0.54	0.53	0.00	0.53	670.93	358.24	23.47	45.55	4.58
75 FRONT	0.00	0.00	0.47	0.30	0.00	0.39	58.30	22.46	7.64	45.05	4.39
75 BACK	0.00	0.00	0.60	0.59	0.00	0.60	3.57	2.12	4.37	45.41	4.45

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** RESULTS ***

CALCULATED DOSES

Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave. (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Beta Error (rad)	Calculated Gamma Dose (rad)	Gamma Error (rad)
76 FRONT	0.00	0.00	0.40	0.49	0.00	0.44	65.13	28.79	4.53	49.23	4.61
76 BACK	0.00	0.00	0.60	0.59	0.00	0.60	3.43	2.05	5.24	49.90	4.69
77 FRONT	0.00	0.00	0.43	0.43	0.00	0.43	40.03	17.18	5.58	70.07	6.67
77 BACK	0.00	0.00	0.26	0.27	0.00	0.26	96.77	25.35	3.31	63.01	5.99
78 FRONT	0.00	0.00	0.32	0.49	0.00	0.40	118.90	48.05	15.98	82.34	8.20
78 BACK	0.00	0.00	0.57	0.49	0.00	0.53	954.27	505.63	77.09	88.56	8.49
80 FRONT	0.00	0.00	0.52	0.44	0.00	0.48	35.30	17.09	3.27	33.59	3.13
80 BACK	0.00	0.00	0.60	0.59	0.00	0.60	15.93	9.49	2.85	32.65	3.18
98 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.16	0.10	0.03	0.31	0.03
98 BACK	0.00	0.00	0.60	0.59	0.00	0.60	0.21	0.12	0.04	0.32	0.03
99 FRONT	0.00	0.00	0.56	0.59	0.00	0.58	0.46	0.26	0.04	0.49	0.05
99 BACK	0.00	0.00	0.53	0.38	0.00	0.45	0.93	0.42	0.10	0.49	0.05

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate Error (rad/hr) (rad/hr)	Gamma Dose Rate Error (rad/hr) (rad/hr)
1 FRONT	10 16	135 13	668 0	1 52E-02 6 95E-03	2 02E-01 1 96E-02
1 BACK	5 14	135 65	668 0	7 69E-03 5 46E-03	2 03E-01 1 91E-02
2 FRONT	197 12	152 31	668 0	2 95E-01 1 92E-01	2 28E-01 2 26E-02
2 BACK	105 42	160 79	668 0	1 58E-01 1 20E-01	2 41E-01 2 40E-02
3 FRONT	4354 33	250 35	668 0	6 52E+00 1 34E+00	3 75E-01 3 49E-02
3 BACK	23 79	225 84	668 0	3 56E-02 3 69E-02	3 38E-01 3 18E-02
4 FRONT	92 57	236 16	668 0	1 39E-01 6 55E-02	3 54E-01 3 48E-02
4 BACK	0 00	234 46	668 0	0 00E+00 0 00E+00	3 51E-01 3 39E-02
5 FRONT	0 00	1955 25	668 0	0 00E+00 0 00E+00	2 93E+00 2 78E-01
5 BACK	467 23	1846 07	668 0	6 99E-01 1 95E-01	2 76E+00 2 65E-01
6 FRONT	105 74	222 10	668 0	1 58E-01 1 07E-01	3 32E-01 3 18E-02
6 BACK	175 05	232 12	668 0	2 62E-01 2 35E-01	3 47E-01 3 23E-02
7 FRONT	153 65	357 63	668 0	2 30E-01 1 88E-01	5 35E-01 5 17E-02
7 BACK	2959 21	349 62	668 0	4 43E+00 2 09E+00	5 23E-01 5 40E-02
8 FRONT	74 28	103 70	668 0	1 11E-01 7 27E-02	1 55E-01 1 45E-02
8 BACK	30 13	100 15	668 0	4 51E-02 3 11E-02	1 50E-01 1 51E-02
11 FRONT	0 00	365 10	645 5	0 00E+00 0 00E+00	5 66E-01 5 82E-02
11 BACK	159 82	213 75	645 5	2 48E-01 1 99E-01	3 31E-01 3 35E-02
12 FRONT	11 13	36 48	645 5	1 72E-02 4 71E-03	5 65E-02 5 54E-03
12 BACK	2 24	33 95	645 5	3 47E-03 2 49E-03	5 26E-02 5 11E-03
13 FRONT	15 08	40 29	645 5	2 34E-02 7 21E-03	6 24E-02 6 09E-03
13 BACK	3 47	38 61	645 5	5 37E-03 4 01E-03	5 98E-02 6 00E-03
14 FRONT	107 34	43 99	645 5	1 66E-01 1 41E-02	6 81E-02 6 58E-03
14 BACK	14 42	39 56	645 5	2 23E-02 1 16E-02	6 13E-02 6 06E-03
15 FRONT	3 41	22 04	645 5	5 28E-03 2 03E-03	3 41E-02 3 38E-03
15 BACK	17 63	20 99	645 5	2 73E-02 6 47E-03	3 25E-02 3 13E-03
17 FRONT	0 75	0 52	1 0	7 47E-01 3 98E-01	5 24E-01 5 16E-02
17 BACK	0 93	0 52	1 0	9 32E-01 6 57E-02	5 24E-01 4 99E-02
18 FRONT	68 19	32 69	645 5	1 06E-01 1 23E-02	5 06E-02 4 79E-03
18 BACK	23 14	27 73	645 5	3 58E-02 2 77E-02	5 30E-02 4 00E-03
19 FRONT	5 66	30 41	645 5	8 78E-03 1 58E-03	4 71E-02 4 59E-03
19 BACK	0 00	32 25	645 5	0 00E+00 0 00E+00	5 00E-02 4 65E-03

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate Error (rad/hr) (rad/hr)		Gamma Dose Rate Error (rad/hr) (rad/hr)	
21 FRONT	0.00	0.21	1.0	0.00E+00	0.00E+00	2.12E-01	1.97E-02
21 BACK	0.04	0.19	1.0	3.91E-02	2.92E-02	1.87E-01	1.75E-02
33 FRONT	76.93	41.60	1.0	7.69E+01	4.47E+00	4.16E+01	3.89E+00
33 BACK	13.60	34.89	1.0	1.36E+01	7.75E+00	3.49E+01	3.25E+00
58 FRONT	16.56	186.66	668.0	2.48E-02	3.77E-02	2.79E-01	2.67E-02
58 BACK	90.55	182.27	668.0	1.36E-01	2.69E-02	2.73E-01	2.59E-02
59 FRONT	0.05	0.20	1.0	4.84E-02	2.82E-02	1.98E-01	2.03E-02
59 BACK	0.03	0.19	1.0	2.87E-02	4.67E-02	1.91E-01	2.56E-02
61 FRONT	0.00	535.32	668.0	0.00E+00	0.00E+00	8.01E-01	7.70E-02
61 BACK	129.04	478.83	668.0	1.93E-01	1.34E-01	7.17E-01	6.95E-02
63 FRONT	135.48	79.23	668.0	2.03E-01	2.15E-02	1.19E-01	1.23E-02
63 BACK	210.36	73.33	668.0	3.15E-01	6.66E-02	1.10E-01	1.12E-02
64 FRONT	30.05	130.27	668.0	4.50E-02	1.57E-02	1.95E-01	1.94E-02
64 BACK	11.16	128.94	668.0	1.67E-02	2.83E-02	1.93E-01	2.03E-02
65 FRONT	214.26	175.19	668.0	3.21E-01	3.26E-02	2.62E-01	2.66E-02
65 BACK	154.39	183.76	668.0	2.31E-01	3.15E-02	2.75E-01	2.64E-02
66 FRONT	49.24	183.98	668.0	7.37E-02	3.38E-02	2.75E-01	2.65E-02
66 BACK	353.37	168.00	668.0	5.29E-01	6.74E-02	2.52E-01	2.37E-02
67 FRONT	44.66	42.25	645.5	6.92E-02	8.36E-03	6.55E-02	6.18E-03
67 BACK	29.05	41.00	645.5	4.50E-02	9.70E-03	6.35E-02	6.09E-03
68 FRONT	39.57	60.94	645.5	6.13E-02	1.37E-02	9.44E-02	8.84E-03
68 BACK	211.89	56.97	645.5	3.28E-01	9.88E-03	8.83E-02	8.29E-03
70 FRONT	68.14	109.49	645.5	1.06E-01	1.63E-02	1.70E-01	1.58E-02
70 BACK	1078.34	138.92	645.5	1.67E+00	9.81E-01	2.15E-01	2.23E-02
71 FRONT	83.06	132.39	645.5	1.29E-01	3.46E-02	2.05E-01	2.01E-02
71 BACK	1946.50	149.45	645.5	3.02E+00	1.34E-01	2.32E-01	2.17E-02
72 FRONT	47.52	345.81	645.5	7.36E-02	2.63E-02	5.36E-01	5.00E-02
72 BACK	213.44	368.56	645.5	3.31E-01	5.45E-02	5.71E-01	5.43E-02
73 FRONT	82.38	69.76	645.5	1.28E-01	2.14E-02	1.08E-01	1.04E-02
73 BACK	5.81	70.19	645.5	9.01E-03	6.76E-03	1.09E-01	1.02E-02
74 FRONT	65.05	45.62	645.5	1.01E-01	1.22E-02	7.07E-02	6.92E-03
74 BACK	358.24	45.55	645.5	5.55E-01	2.64E-02	7.06E-02	7.10E-03
75 FRONT	22.46	45.05	645.5	3.48E-02	1.18E-02	6.98E-02	6.80E-03
75 BACK	2.12	45.41	645.5	3.29E-03	6.74E-03	7.04E-02	6.89E-03

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Dose Rate Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Dose Rate Error (rad/hr)
76 FRONT	28.79	49.23	645.5	4.46E-02	7.01E-03	7.63E-02	7.13E-03
76 BACK	2.05	49.90	645.5	3.17E-03	8.12E-03	7.73E-02	7.26E-03
77 FRONT	17.18	70.07	645.5	2.66E-02	8.64E-03	1.09E-01	1.03E-02
77 BACK	25.35	63.01	645.5	3.93E-02	5.13E-03	9.76E-02	9.28E-03
78 FRONT	48.05	82.34	645.5	7.44E-02	2.47E-02	1.28E-01	1.27E-02
78 BACK	505.63	88.56	645.5	7.83E-01	1.19E-01	1.37E-01	1.32E-02
80 FRONT	17.09	33.59	645.5	2.65E-02	5.06E-03	5.20E-02	4.86E-03
80 BACK	9.49	32.65	645.5	1.47E-02	4.42E-03	5.06E-02	4.93E-03
98 FRONT	0.10	0.31	1.0	9.53E-02	3.46E-02	3.13E-01	2.91E-02
98 BACK	0.12	0.32	1.0	1.25E-01	3.51E-02	3.16E-01	3.13E-02
99 FRONT	0.26	0.49	1.0	2.64E-01	3.55E-02	4.89E-01	4.70E-02
99 BACK	0.42	0.49	1.0	4.22E-01	1.02E-01	4.87E-01	4.63E-02

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
B1 FRONT	Raw 631.70	0.00	0.00	319.00	312.40	0.00	244.20
	Raw 634.00	0.00	0.00	338.40	298.90	0.00	253.00
	Raw 688.00	0.00	0.00	326.20	281.00*	0.00	271.10*
	Ave 651.23 +/- 5%	0.00 +/- 0%	0.00 +/- 0%	327.87 +/- 3%	305.65 +/- 3%	0.00 +/- 0%	248.60 +/- 3%
	Beta 402.63	0.00	0.00	79.27	57.05	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1969	0.1417	0.0000	
B1 BACK	Raw 824.40	0.00	0.00	375.50	303.50	0.00	245.40
	Raw 822.00	0.00	0.00	369.50	270.50*	0.00	228.30
	Raw 744.10*	0.00	0.00	367.30	302.50	0.00	215.70
	Ave 823.20 +/- 0%	0.00 +/- 0%	0.00 +/- 0%	370.77 +/- 1%	303.00 +/- 0%	0.00 +/- 0%	229.80 +/- 6%
	Beta 593.40	0.00	0.00	140.97	73.20	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2376	0.1234	0.0000	
B2 FRONT	Raw 537.00	0.00	0.00	263.90	253.30	0.00	231.80
	Raw 553.00	0.00	0.00	287.40	216.10	0.00	247.70
	Raw 589.50	0.00	0.00	273.20	234.50	0.00	218.70
	Ave 559.83 +/- 5%	0.00 +/- 0%	0.00 +/- 0%	274.83 +/- 4%	234.63 +/- 8%	0.00 +/- 0%	232.73 +/- 6%
	Beta 327.10	0.00	0.00	42.10	1.90	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1287	0.0058	0.0000	
B2 BACK	Raw 457.90	0.00	0.00	275.30	234.30	0.00	225.00
	Raw 461.10	0.00	0.00	289.30	246.90	0.00	209.20
	Raw 475.40	0.00	0.00	261.30*	254.20	0.00	220.50
	Ave 464.80 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	282.30 +/- 4%	245.13 +/- 4%	0.00 +/- 0%	218.23 +/- 4%
	Beta 246.57	0.00	0.00	64.07	26.90	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2598	0.1091	0.0000	
B3 FRONT	Raw 0.98	0.00	0.00	1.06*	0.74	0.00	0.87
	Raw 0.98	0.00	0.00	0.88*	0.76	0.00	0.85
	Raw 0.95	0.00	0.00	0.92*	0.86*	0.00	0.90
	Ave 0.97 +/- 2%	0.00 +/- 0%	0.00 +/- 0%	0.95 +/- 10%	0.95 +/- 1%	0.00 +/- 0%	0.87 +/- 3%
	Beta 0.09	0.00	0.00	0.00	0.08	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.8406	0.0000	
B3 BACK	Raw 0.94	0.00	0.00	0.89	0.74	0.00	0.82
	Raw 0.94	0.00	0.00	0.93	0.72	0.00	0.92*
	Raw 0.87	0.00	0.00	0.95	0.75	0.00	0.85
	Ave 0.92 +/- 4%	0.00 +/- 0%	0.00 +/- 0%	0.92 +/- 4%	0.94 +/- 2%	0.00 +/- 0%	0.84 +/- 2%
	Beta 0.08	0.00	0.00	0.09	0.10	0.00	0.00
	Ratio 1.00	0.0000	0.0000	1.1000	1.3000	0.0000	

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
B4 FRONT	Raw 50.02*	0.00	0.00	50.88	45.74	0.00	47.10
	Raw 53.24	0.00	0.00	47.55	42.38	0.00	43.50
	Raw 55.88	0.00	0.00	46.59	46.34	0.00	43.12
	Ave 54.56+/- 3%	0.00+/- 0%	0.00+/- 0%	48.34+/- 5%	44.82+/- 5%	0.00+/- 0%	44.57+/- 5%
	Beta 9.99	0.00	0.00	3.77	0.25	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3772	0.0247	0.0000	0.00
B4 BACK	Raw 71.23	0.00	0.00	53.76	47.41	0.00	45.70
	Raw 64.84*	0.00	0.00	51.90	46.99	0.00	44.18
	Raw 70.96	0.00	0.00	58.14*	43.04*	0.00	49.14*
	Ave 71.10+/- 0%	0.00+/- 0%	0.00+/- 0%	52.83+/- 2%	47.20+/- 1%	0.00+/- 0%	44.94+/- 2%
	Beta 26.16	0.00	0.00	7.89	2.26	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3017	0.0864	0.0000	0.00
B5 FRONT	Raw 16.99	0.00	0.00	16.35	14.76	0.00	17.12
	Raw 16.94	0.00	0.00	17.28	15.06	0.00	16.66
	Raw 18.19	0.00	0.00	16.06	15.46	0.00	16.81
	Ave 17.37+/- 4%	0.00+/- 0%	0.00+/- 0%	16.56+/- 4%	15.09+/- 2%	0.00+/- 0%	16.86+/- 1%
	Beta 0.51	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.00
B5 BACK	Raw 15.73	0.00	0.00	18.82	17.92	0.00	16.39
	Raw 16.92	0.00	0.00	17.68	17.38	0.00	15.94
	Raw 16.89	0.00	0.00	18.36	18.06	0.00	15.52
	Ave 16.51+/- 4%	0.00+/- 0%	0.00+/- 0%	18.29+/- 3%	17.79+/- 2%	0.00+/- 0%	15.95+/- 3%
	Beta 0.56	0.00	0.00	2.34	1.84	0.00	0.00
	Ratio 1.00	0.0000	0.0000	4.1479	3.2603	0.0000	0.00
B6 FRONT	Raw 1062.00	0.00	0.00	795.60	763.70	0.00	753.50
	Raw 1141.00	0.00	0.00	774.70	774.00	0.00	736.10
	Raw 1002.00	0.00	0.00	787.90	775.20	0.00	750.80
	Ave 1068.33+/- 7%	0.00+/- 0%	0.00+/- 0%	786.07+/- 1%	770.97+/- 1%	0.00+/- 0%	746.80+/- 1%
	Beta 321.53	0.00	0.00	39.27	24.17	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.1221	0.0752	0.0000	0.00
B6 BACK	Raw 1029.00	0.00	0.00	855.30	806.30	0.00	732.50
	Raw 975.10	0.00	0.00	800.30	834.70	0.00	769.00
	Raw 921.30	0.00	0.00	853.90	790.50	0.00	686.50*
	Ave 975.13+/- 6%	0.00+/- 0%	0.00+/- 0%	836.50+/- 4%	810.50+/- 3%	0.00+/- 0%	750.75+/- 3%
	Beta 224.38	0.00	0.00	85.75	59.75	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3822	0.2663	0.0000	0.00

(* indicates a rejected filer)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
B7 FRONT	Raw 594 90	0 00	0 00	559 20	521 60	0 00	544 10
	Raw 604 40	0 00	0 00	529 40	549 80	0 00	539 30
	Raw 563 30	0 00	0 00	547 00	535 30	0 00	519 90
	Ave 587 53+/- 4%	0 00+/- 0%	0 00+/- 0%	545 20+/- 3%	535 57+/- 3%	0 00+/- 0%	534 43+/- 2%
	Beta 53 10	0 00	0 00	10 77	1 13	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2028	0 0213	0 0000	0 00
B7 BACK	Raw 559 80	0 00	0 00	535 60	513 70	0 00	515 50
	Raw 532 00	0 00	0 00	576 60	544 00	0 00	503 10
	Raw 564 20	0 00	0 00	534 40	545 60	0 00	525 80
	Ave 552 00+/- 3%	0 00+/- 0%	0 00+/- 0%	548 93+/- 4%	534 43+/- 3%	0 00+/- 0%	514 80+/- 2%
	Beta 37 20	0 00	0 00	34 13	19 63	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 9176	0 5278	0 0000	0 00
B8 FRONT	Raw 292 20	0 00	0 00	255 10	266 40	0 00	254 40
	Raw 296 60	0 00	0 00	250 00	267 10	0 00	253 70
	Raw 292 50	0 00	0 00	266 30	290 20	0 00	247 50
	Ave 293 77+/- 1%	0 00+/- 0%	0 00+/- 0%	257 13+/- 3%	274 57+/- 5%	0 00+/- 0%	251 87+/- 2%
	Beta 41 90	0 00	0 00	5 27	22 70	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1257	0 5418	0 0000	0 00
B8 BACK	Raw 262 00	0 00	0 00	252 40	262 80	0 00	254 50
	Raw 275 50	0 00	0 00	275 00	252 40	0 00	252 00
	Raw 276 80	0 00	0 00	255 50	267 00	0 00	253 70
	Ave 271 43+/- 3%	0 00+/- 0%	0 00+/- 0%	260 97+/- 5%	260 73+/- 3%	0 00+/- 0%	253 40+/- 1%
	Beta 18 03	0 00	0 00	7 57	7 33	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 4196	0 4067	0 0000	0 00
B9 FRONT	Raw 112 90	0 00	0 00	103 80	108 10	0 00	108 20
	Raw 112 00	0 00	0 00	104 40	102 40	0 00	110 60
	Raw 111 90	0 00	0 00	108 50	111 50	0 00	101 10
	Ave 112 27+/- 0%	0 00+/- 0%	0 00+/- 0%	105 57+/- 2%	107 33+/- 4%	0 00+/- 0%	106 63+/- 5%
	Beta 5 63	0 00	0 00	0 00	0 70	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 1243	0 0000	0 00
B9 BACK	Raw 113 50	0 00	0 00	102 10	103 80	0 00	99 45
	Raw 106 20	0 00	0 00	107 90	99 72	0 00	98 90
	Raw 105 30	0 00	0 00	95 43	100 00	0 00	104 00
	Ave 108 33+/- 4%	0 00+/- 0%	0 00+/- 0%	101 81+/- 6%	101 17+/- 2%	0 00+/- 0%	100 78+/- 3%
	Beta 7 55	0 00	0 00	1 03	0 39	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 1360	0 0517	0 0000	0 00

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
90 FRONT	Raw 373 80	0.00	0.00	263 50	220 40	0.00	201.50
	Raw 375 30	0.00	0.00	260 30	211 80	0.00	201.10
	Raw 370 40	0.00	0.00	262 80	228.80	0.00	198.70
	Ave 373 17+/- 1%	0.00+/- 0%	0.00+/- 0%	262 20+/- 1%	220 33+/- 4%	0.00+/- 0%	200.43+/- 1%
	Beta 172 73	0.00	0.00	61 77	19 90	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.3576	0.1152	0.0000	
90 BACK	Raw 1030 00	0.00	0.00	482 30*	299 90	0.00	219.40
	Raw 1005 00	0.00	0.00	381 90*	244 40*	0.00	231.80
	Raw 951 40	0.00	0.00	455 00*	294 50	0.00	236.90
	Ave 995 47+/- 4%	0.00+/- 0%	0.00+/- 0%	0.00+/- 12%	297 20+/- 1%	0.00+/- 0%	229.37+/- 4%
	Beta 766 10	0.00	0.00	0.00	67 83	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0885	0.0000	
91 FRONT	Raw 3330 00	0.00	0.00	932 00	751.40	0.00	288.00
	Raw 3265 00	0.00	0.00	950 60	702 90	0.00	261.60*
	Raw 3327 00	0.00	0.00	941 30	684.30	0.00	297.80
	Ave 3307 33+/- 1%	0.00+/- 0%	0.00+/- 0%	941.30+/- 1%	712.87+/- 5%	0.00+/- 0%	292.90+/- 2%
	Beta 3014 43	0.00	0.00	648 40	419.97	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2151	0.1393	0.0000	
91 BACK	Raw 369 20*	0.00	0.00	299 20	277 60	0.00	245.10*
	Raw 412 40	0.00	0.00	313 80	257 40	0.00	272.60
	Raw 397 10	0.00	0.00	286 20	261 70	0.00	267.80
	Ave 404 75+/- 3%	0.00+/- 0%	0.00+/- 0%	299 73+/- 5%	265 57+/- 4%	0.00+/- 0%	270.20+/- 1%
	Beta 134 55	0.00	0.00	29 33	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.2195	0.0000	0.0000	
92 FRONT	Raw 151 20	0.00	0.00	132.70	127 20	0.00	126.70
	Raw 152 60	0.00	0.00	128.60	126 10	0.00	126.60
	Raw 152 10	0.00	0.00	131 30	127 70	0.00	132.40
	Ave 151 97+/- 0%	0.00+/- 0%	0.00+/- 0%	130.87+/- 2%	127.00+/- 1%	0.00+/- 0%	128.57+/- 3%
	Beta 23 40	0.00	0.00	2.30	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0983	0.0000	0.0000	
92 BACK	Raw 155 20	0.00	0.00	137 30	119 10	0.00	119.90
	Raw 142 70	0.00	0.00	127 90	131.20	0.00	121.60
	Raw 153 20	0.00	0.00	137 90	126 20	0.00	139.80*
	Ave 150 37+/- 4%	0.00+/- 0%	0.00+/- 0%	134.37+/- 4%	125.50+/- 5%	0.00+/- 0%	120.75+/- 1%
	Beta 29 62	0.00	0.00	13 62	4.75	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.4598	0.1604	0.0000	

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement. ILD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
96 FRONT	Raw 53 59	0 00	0 00	48 43	45 79	0 00	42 23
	Raw 55 91	0 00	0 00	46 67	42 77	0 00	40 80
	Raw 51 50	0 00	0 00	47 25	15 31	0 00	40 71
	Ave 53 67+/- 4%	0 00+/- 0%	0 00+/- 0%	47 45+/- 2%	44 62+/- 4%	0 00+/- 0%	41 25+/- 2%
	Beta 12 42	0 00	0 00	6 20	3 38	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 4995	0 2719	0 0000	
96 BACK	Raw 51 13	0 00	0 00	43 55	39 66	0 00	34 05*
	Raw 51 09	0 00	0 00	44 64	39 53	0 00	42 33
	Raw 52 01	0 00	0 00	44 94	41 39	0 00	40 40
	Ave 51 41+/- 1%	0 00+/- 0%	0 00+/- 0%	44 38+/- 2%	40 19+/- 3%	0 00+/- 0%	41 37+/- 3%
	Beta 10 04	0 00	0 00	3 01	0 00	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 2998	0 0000	0 0000	
97 FRONT	Raw 20 55	0 00	0 00	19 91	18 87	0 00	18 00
	Raw 20 37	0 00	0 00	18 94	18 52	0 00	18 34
	Raw 19 89	0 00	0 00	18 71	17 60	0 00	18 02
	Ave 20 27+/- 2%	0 00+/- 0%	0 00+/- 0%	19 19+/- 3%	18 33+/- 4%	0 00+/- 0%	18 12+/- 1%
	Beta 2 15	0 00	0 00	1 07	0 21	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 4961	0 0977	0 0000	
97 BACK	Raw 18 74	0 00	0 00	17 15	19 67	0 00	19 25
	Raw 18 32	0 00	0 00	18 08	19 75	0 00	18 35
	Raw 16 64*	0 00	0 00	18 38	18 75	0 00	18 45
	Ave 18 53+/- 2%	0 00+/- 0%	0 00+/- 0%	18 20+/- 1%	19 39+/- 3%	0 00+/- 0%	18 68+/- 3%
	Beta 0 00	0 00	0 00	0 00	0 71	0 00	0 00
	Ratio 1 00	0 0000	0 0000	0 0000	0 0000	0 0000	

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
93 FRONT	Raw	92 12	0 00	0 00	96 34	92 24	0 00	84 32
	Raw	94 96	0 00	0 00	92 76	87 96	0 00	92 92
	Raw	93 34	0 00	0 00	93 77	92 32	0 00	88 72
	Ave	93 47+/- 2%	0 00+/- 0%	0 00+/- 0%	94 29+/- 2%	90 84+/- 3%	0 00+/- 0%	88 65+/- 5%
	Beta	4 82	0 00	0 00	5 64	2 19	0 00	0 00
	Ratio	1 00	0 0000	0 0000	1 1694	0 4537	0 0000	
93 BACK	Raw	91 78	0 00	0 00	86 92	81 70	0 00	82 74
	Raw	89 95	0 00	0 00	89 44	85 26	0 00	81 21
	Raw	87 64	0 00	0 00	89 84	85 14	0 00	81 12
	Ave	89 79+/- 2%	0 00+/- 0%	0 00+/- 0%	88 73+/- 2%	84 03+/- 2%	0 00+/- 0%	81 69+/- 1%
	Beta	8 10	0 00	0 00	7 04	2 34	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 8695	0 2893	0 0000	
94 FRONT	Raw	907 70	0 00	0 00	424 50	338 80	0 00	269 90
	Raw	936 20	0 00	0 00	424 00	338 60	0 00	276 20
	Raw	955 20	0 00	0 00	408 20	324 80	0 00	237 00*
	Ave	933 03+/- 3%	0 00+/- 0%	0 00+/- 0%	418 90+/- 2%	334 07+/- 2%	0 00+/- 0%	273 05+/- 2%
	Beta	659 98	0 00	0 00	145 85	61 02	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 2210	0 0925	0 0000	
94 BACK	Raw	393 20	0 00	0 00	265 00	226 40	0 00	224 90
	Raw	397 90	0 00	0 00	267 00	234 60	0 00	226 00
	Raw	385 30	0 00	0 00	227 00*	226 10	0 00	211 00
	Ave	392 13+/- 2%	0 00+/- 0%	0 00+/- 0%	266 00+/- 1%	229 03+/- 2%	0 00+/- 0%	220 63+/- 4%
	Beta	171 50	0 00	0 00	45 37	8 40	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 2645	0 0490	0 0000	
95 FRONT	Raw	475 90	0 00	0 00	260 00*	195 40	0 00	157 10*
	Raw	463 90	0 00	0 00	225 20	188 90	0 00	136 70
	Raw	465 00	0 00	0 00	216 70	200 10	0 00	132 50
	Ave	468 27+/- 1%	0 00+/- 0%	0 00+/- 0%	220 95+/- 3%	194 80+/- 3%	0 00+/- 0%	134 60+/- 2%
	Beta	333 67	0 00	0 00	86 35	60 20	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 2588	0 1804	0 0000	
95 BACK	Raw	298 60	0 00	0 00	145 10*	127 50	0 00	116 70
	Raw	306 50	0 00	0 00	170 90*	128 50	0 00	120 60
	Raw	308 30	0 00	0 00	160 00*	137 40	0 00	119 00
	Ave	304 47+/- 2%	0 00+/- 0%	0 00+/- 0%	0 00+/- 8%	131 13+/- 4%	0 00+/- 0%	118 77+/- 2%
	Beta	185 70	0 00	0 00	0 00	12 37	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0666	0 0000	

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-B2

*** RESULTS ***							CALCULATED DOSES				
Dosimeter	005" (rad/nc)	010" (rad/nc)	Calibration 020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave (rad/nc)	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
81 FRONT	0 00	0 00	0 46	0 43	0 00	0 44	402 63	178 57	16 16	50 64	4 88
81 BACK	0 00	0 00	0 43	0 45	0 00	0 44	593 40	260 25	12 37	46 81	5 31
82 FRONT	0 00	0 00	0 51	0 58	0 00	0 54	327 10	178 12	24 04	47 41	5 31
82 BACK	0 00	0 00	0 41	0 47	0 00	0 44	246 57	108 06	11 38	44 45	4 45
83 FRONT	0 00	0 00	0 60	0 22	0 00	0 41	0 09	0 04	0 03	0 18	0 02
83 BACK	0 00	0 00	0 22	0 22	0 00	0 22	0 08	0 02	0 01	0 17	0 02
84 FRONT	0 00	0 00	0 32	0 56	0 00	0 44	9 99	4 41	2 11	9 08	0 96
84 BACK	0 00	0 00	0 38	0 49	0 00	0 44	26 16	11 39	2 16	9 15	0 88
85 FRONT	0 00	0 00	0 60	0 59	0 00	0 60	0 51	0 30	0 44	3 44	0 32
85 BACK	0 00	0 00	0 22	0 22	0 00	0 22	0 56	0 12	0 18	3 25	0 31
86 FRONT	0 00	0 00	0 51	0 50	0 00	0 51	321 53	163 45	35 80	152 12	14 28
86 BACK	0 00	0 00	0 32	0 29	0 00	0 31	224 38	68 48	18 71	152 93	15 16
87 FRONT	0 00	0 00	0 45	0 56	0 00	0 51	53 10	26 99	13 42	108 86	10 46
87 BACK	0 00	0 00	0 22	0 22	0 00	0 22	37 20	8 11	4 54	104 86	10 02
88 FRONT	0 00	0 00	0 51	0 22	0 00	0 36	41 90	15 24	8 79	51 31	4 83
88 BACK	0 00	0 00	0 29	0 22	0 00	0 25	18 03	4 59	2 30	51 62	4 81
89 FRONT	0 00	0 00	0 60	0 45	0 00	0 53	5 63	2 97	2 69	21 72	2 26
89 BACK	0 00	0 00	0 50	0 53	0 00	0 52	7 55	3 90	2 74	20 53	1 99
90 FRONT	0 00	0 00	0 34	0 46	0 00	0 40	172 73	68 83	15 11	40 83	3 81
90 BACK	0 00	0 00	0 60	0 49	0 00	0 55	766 10	418 54	65 19	46 72	4 72
91 FRONT	0 00	0 00	0 44	0 43	0 00	0 44	3014 43	1320 44	26 10	59 66	5 73
91 BACK	0 00	0 00	0 44	0 59	0 00	0 51	134 55	69 16	15 32	55 04	5 17
92 FRONT	0 00	0 00	0 53	0 59	0 00	0 56	23 40	13 08	2 13	26 19	2 53
92 BACK	0 00	0 00	0 26	0 41	0 00	0 34	29 62	9 93	3 87	24 60	2 30
93 FRONT	0 00	0 00	0 22	0 22	0 00	0 22	4 82	1 05	0 99	18 06	1 89
93 BACK	0 00	0 00	0 22	0 27	0 00	0 24	8 10	1 96	0 61	16 64	1 56
94 FRONT	0 00	0 00	0 44	0 49	0 00	0 46	659 98	304 89	24 67	55 62	5 25
94 BACK	0 00	0 00	0 41	0 53	0 00	0 47	171 50	80 60	16 28	44 94	4 51
95 FRONT	0 00	0 00	0 41	0 37	0 00	0 40	333 67	133 10	6 12	27 42	2 62
95 BACK	0 00	0 00	0 60	0 51	0 00	0 56	185 70	103 72	12 02	24 19	2 29
96 FRONT	0 00	0 00	0 23	0 29	0 00	0 26	12 42	3 21	0 78	8 40	0 80
96 BACK	0 00	0 00	0 38	0 59	0 00	0 48	10 04	4 86	1 64	8 43	0 83

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

*** RESULTS ***

CALCULATED DOSES

Dosimeter	Calibration Factors					Mylar Chip Reading (nc)	Calculated Beta		Calculated Gamma	
	005" (rad/nc)	010" (rad/nc)	020" (rad/nc)	032" (rad/nc)	064" (rad/nc)		Dose (rad)	Error (rad)	Dose (rad)	Error (rad)
97 FRONT	0.00	0.00	0.23	0.48	0.00	2.15	0.77	0.40	3.69	0.35
97 BACK	0.00	0.00	0.60	0.59	0.00	0.00	0.00	0.00	3.81	0.37

Pre-Flushing of the Reactor Building Basement. ILD Measurements -- DCH-6-82

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Dose Rate Error (rad/hr)	Gamma Dose Rate (rad/hr)	Dose Rate Error (rad/hr)
81 FRONT	178 57	50 64	3 1	5 72E+01	5 18E+00	1 62E+01	1 56E+00
81 BACK	260 25	46 81	3 1	8 34E+01	3 96E+00	1 50E+01	1 70E+00
82 FRONT	178 12	47 41	3 1	5 71E+01	7 70E+00	1 52E+01	1 70E+00
82 BACK	108 06	44 45	3 1	3 46E+01	3 65E+00	1 42E+01	1 43E+00
83 FRONT	0 04	0 18	1 0	3 78E-02	2 83E-02	1 78E-01	1 75E-02
83 BACK	0 02	0 17	1 0	1 74E-02	9 10E-03	1 70E-01	1 62E-02
84 FRONT	4 41	9 08	3 1	1 41E+00	6 77E-01	2 91E+00	3 06E-01
84 BACK	11 39	9 15	3 1	3 65E+00	6 92E-01	2 93E+00	2 82E-01
85 FRONT	0 30	3 44	3 1	9 74E-02	1 42E-01	1 10E+00	1 04E-01
85 BACK	0 12	3 25	3 1	3 94E-02	5 63E-02	1 04E+00	1 01E-01
86 FRONT	163 45	152 12	2 3	7 02E+01	1 54E+01	6 53E+01	6 13E+00
86 BACK	68 48	152 93	2 3	2 94E+01	8 03E+00	6 56E+01	6 51E+00
87 FRONT	26 99	108 86	2 3	1 16E+01	5 76E+00	4 67E+01	4 49E+00
87 BACK	8 11	104 86	2 3	3 48E+00	1 95E+00	4 50E+01	4 30E+00
88 FRONT	15 24	51 31	2 3	6 54E+00	3 77E+00	2 20E+01	2 07E+00
88 BACK	4 59	51 62	2 3	1 97E+00	9 89E-01	2 22E+01	2 06E+00
89 FRONT	2 97	21 72	2 3	1 27E+00	1 15E+00	9 32E+00	9 69E-01
89 BACK	3 90	20 53	2 3	1 67E+00	1 18E+00	8 81E+00	8 55E-01
90 FRONT	68 83	40 83	3 1	2 23E+01	4 90E+00	1 33E+01	1 24E+00
90 BACK	418 54	46 72	3 1	1 36E+02	2 12E+01	1 52E+01	1 53E+00
91 FRONT	1320 44	57 66	3 1	4 29E+02	8 47E+00	1 94E+01	1 86E+00
91 BACK	69 16	55 04	3 1	2 25E+01	4 98E+00	1 79E+01	1 66E+00
92 FRONT	13 08	26 19	3 1	4 25E+00	6 92E-01	8 50E+00	8 21E-01
92 BACK	9 93	24 60	3 1	3 22E+00	1 26E+00	7 99E+00	7 47E-01
93 FRONT	1 05	18 06	3 1	3 41E-01	3 21E-01	5 86E+00	6 15E-01
93 BACK	1 96	16 64	3 1	6 37E-01	1 99E-01	5 40E+00	5 06E-01
94 FRONT	304 89	55 62	3 1	9 90E+01	8 01E+00	1 81E+01	1 71E+00
94 BACK	80 60	44 94	3 1	2 62E+01	5 23E+00	1 46E+01	1 47E+00
95 FRONT	133 10	27 42	3 1	4 32E+01	1 99E+00	8 90E+00	8 51E-01
95 BACK	103 72	24 19	3 1	3 37E+01	3 90E+00	7 85E+00	7 42E-01
96 FRONT	3 21	8 40	3 1	1 04E+00	2 52E-01	2 73E+00	2 60E-01
96 BACK	4 86	8 43	3 1	1 58E+00	5 33E-01	2 74E+00	2 70E-01

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-B2

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate Error (rad/hr) (rad/hr)	Gamma Dose Rate Error (rad/hr) (rad/hr)
97 FRONT	0.77	3.69	3.1	2.49E-01 1.30E-01	1.20E+00 1.12E-01
97 BACK	0.00	3.81	3.1	0.00E+00 0.00E+00	1.24E+00 1.19E-01