



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLE OBTAINED FROM YOUR PROPERTY

Dear [ ]:

With your permission, on December 4, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from your property. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property indicated a U-238 concentration of 2.0 pCi/g and 1.4 pCi/g of soil, respectively. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50 to 80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

Enclosed for your information is a copy of the Joint Report of Offsite Soil Sampling by the MDPH-RCP and NRC RI. Should you have any questions, please contact me at (610) 337-5200 or Marie Miller of my staff at (610) 337-5205.

Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
Division of Nuclear Material Safety

Enclosure: Joint Report

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PDR STPRG ESGMA  
PDR



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**NUCLEAR REGULATORY COMMISSION**  
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475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLE OBTAINED FROM ESSCO'S PROPERTY

Dear [ ]:

With your permission, on December 4, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from the field owned by Essco, adjacent to the Essco facility. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from Essco's property indicated a U-238 concentration of 2.5 pCi/g and 2.3 pCi/g of soil, respectively. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50-80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

Enclosed for your information is a copy of the Joint Report of Offsite Soil Sampling by the MDPH-RCP and NRC RI. Should you have any questions, please contact me at (610) 337-5200 or Marie Miller of my staff at (610) 337-5205.

Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
Division of Nuclear Material Safety

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December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLE OBTAINED FROM YOUR PROPERTY

Dear [ ]:

With your permission, on December 5, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from the yard behind your facility building. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property indicated a U-238 concentration of 1.0 pCi/g and 3.0 pCi/g of soil, respectively. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50 to 80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

Enclosed for your information is a copy of the Joint Report of Offsite Soil Sampling by the MDPH-RCP and NRC RI. Should you have any questions, please contact me at (610) 337-5200 or Marie Miller of my staff at (610) 337-5205.

Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
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December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLE OBTAINED FROM YOUR PROPERTY

Dear Ms. [ ]:

With your permission, on December 3, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from your property. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property indicated a U-238 concentration of 2.2 pCi/g and 2.6 pCi/g of soil, respectively. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50-80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

Enclosed for your information is a copy of the Joint Report of Offsite Soil Sampling by the MDPH-RCP and NRC RI. Should you have any questions, please contact me at (610) 337-5200 or Marie Miller of my staff at (610) 337-5205.

Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
Division of Nuclear Material Safety

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December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLE OBTAINED FROM YOUR PROPERTY

Dear Mr. & Mrs. [ ]:

With your permission, on December 4, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from your property. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property both indicated a U-238 concentration of 1 pCi/g of soil. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50-80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

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Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
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December 13, 1996

**NAME & ADDRESS DELETED  
UNDER 10 CFR 2.790**

Subject: RESULTS OF SOIL SAMPLES OBTAINED FROM [Deleted]

Dear Mr. [Deleted]:

With your permission, on December 5, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained two soil samples from areas from the front and rear of the Powder Mill Plaza, which is managed by your company. These samples were brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the two samples (G-2 and G-2-A) obtained from [Deleted] indicated a U-238 concentration which ranged from 0.9 to 1.9 pCi/g and 1.5 to 3.3 pCi/g of soil, respectively. In addition, sample G-2 was analyzed by ORISE, the NRC Reference Laboratory, by alpha spectrometry for a more sensitive analysis of U-238 and for total uranium (U-238, U-234 and U-235). This analysis indicated a U-238 concentration of 1.04 pCi/g and a total uranium concentration of 1.82 pCi/g. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil.

Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50 to 80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

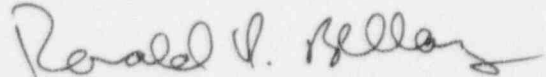
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J. Zinc, Vice President  
Atlantic Management Corp.

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Enclosed for your information is a copy of the Joint Report of Offsite Soil Sampling by the MDPH-RCP and NRC RI. Should you have any questions, please contact me at (610) 337-5200 or Marie Miller of my staff at (610) 337-5205.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ronald R. Bellamy".

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
Division of Nuclear Material Safety

Enclosure: Joint Report



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Dear Mr. [ ]:

With your permission, on December 3, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from your property. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property indicated a U-238 concentration of 3.1 pCi/g and 3.8 pCi/g of soil, respectively. This sample was also analyzed by ORISE, the NRC Reference Laboratory, by alpha spectrometry for a more sensitive analysis for U-238, and for total uranium (U-238, U-235, and U-234). This analysis indicated a U-238 concentration of 2.11 pCi/g and a total uranium concentration of 2.98 pCi/g. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is slightly outside the range typical for natural background in the area. Further, the ratio of U-238 to U-234 indicates depleted uranium. However, the concentration of U-238 is not considered significant to require any remediation action. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50-80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

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Sincerely,

Ronald R. Bellamy, Chief  
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Dear Mrs. [ ]:

With your permission, on December 5, 1995, representatives of the U.S. Nuclear Regulatory Commission (NRC) and the Commonwealth of Massachusetts Department of Public Health, Radiation Control Program (MDPH-RCP), obtained a soil sample from your property. This sample was brought back to the NRC Region I laboratory and MDPH-RCP laboratory and analyzed for the concentration of uranium-238 (U-238) in the soil. The analysis would determine if there were concentrations of U-238 from depleted uranium processing at Nuclear Metals, Inc., (NMI), in addition to naturally occurring U-238.

The amount of naturally occurring U-238 varies in soil sampled from areas in Massachusetts at least 5 miles from NMI. Gamma spectrometry results from past and present soil sampling conducted by the NRC, MDPH and the Oak Ridge Institute for Science and Education (ORISE) range from 0.7 to 5.0 picocuries per gram (pCi/g) of U-238 in soil, with an average background for U-238 of  $1.9 \pm 1.1$  pCi/g of soil. The NRC and MDPH-RCP results for the sample obtained from your property indicated a U-238 concentration of 2.3 pCi/g and 2.2 pCi/g of soil, respectively. The criteria that the NRC is using to determine when soil remediation is necessary for residual uranium contamination from NMI is 35 pCi of depleted uranium per gram of soil. Based on the results of analyzing this sample, the measured soil concentration is within the range typical for natural background in the area. The 35 pCi/g of soil concentration specified by the NRC may be compared with naturally occurring uranium ore concentration of 1.3 pCi/g in igneous (volcanic) rock, 1.9 to 4 pCi/g of uranium in western Pennsylvania soils, 50-80 pCi/g of uranium in Tennessee bituminous shale and 120 pCi/g uranium in Florida phosphate rock.

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Sincerely,

Ronald R. Bellamy, Chief  
Decommissioning and Lab Branch  
Division of Nuclear Material Safety

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Distribution:

Region I Docket Room (w/concurrences) Docket No. 040-00672

PUBLIC (non-proprietary version)

Nuclear Safety and Information Center (NSIC) (non-proprietary version)

DOCUMENT NAME: S: Soil.mer

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|--------|--------------------|----------------------------|---------|---------|---------|---------|
| OFFICE | DNMS/RI- <i>mm</i> | DNMS/RI <i>mm</i> <b>N</b> |         |         |         |         |
| NAME   | MMiller            | RBellamy                   |         |         |         |         |
| DATE   | 12/12/96           | 12/12/96                   | 12/ /96 | 12/ /96 | 12/ /96 | 12/ /96 |

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