



October 18, 2005

Mr. Robert Schaaf  
Sr. Project Manager  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Stop O-11F1  
Washington, DC 20555

**Palisades Nuclear Plant, Response to Supplemental Questions Concerning Radioactive Solid Waste Management**

Dear Mr. Schaaf:

Enclosed, please find the supplemental information regarding Palisades Nuclear Generating Plant radioactive solid waste management. This information is in response to your supplemental questions in a September 9, 2005 e-mail and subsequent September 12, 2005 conference call. Enclosure 1 and Table 1 provides responses and information to address your inquiries.

Please contact me at 763-295-1309 should you need further clarification.

Sincerely,

James Holthaus  
Environmental Project Manager  
Nuclear Management Company, LLC  
Palisades Nuclear Plant

## Enclosure 1

### **NRC Question 1a:**

1. Attachment 4 of the Annual Radioactive Effluent Release and Waste Disposal Reports (RERWDRs) summarizes all solid radwaste classification, sources, volume shipped, and curie and nuclide content.

a. Please clarify whether this table indicates waste shipped from a third party processing center to a disposal facility or shipped from the Palisades site.

### **NMC Response to NRC Question 1a:**

The tables contained in Attachment 4 of the RERWDRs for 2000-2004 summarize waste shipped from the Palisades site for treatment or processing. These totals may include waste sent out for volume reduction; thereby the final waste volume will be lower and may not be realized until following years.

### **NRC Question 1b:**

1b. Provide the volumes listed in Attachment 4 of the RERWDRs are for waste shipped from a third party to a disposal facility, what were the volumes shipped from Palisades in 2000, 2001, 2002, 2003 and 2004? Provide tables similar to those given in Attachment 4 of the RERWDs for the waste shipped from the site in each year.

### **NMC Response to NRC question 1b:**

Attachment 4 of the RERWDRs summarizes waste shipped from the Palisades site. Table 1 (see attached) identifies the number of shipments of solid waste from the Palisades site, waste class (AS, AU, B, C), location of shipments, total volumes shipped, total curie counts and principal radionuclide compositions for the years 2000, 2001, 2002, 2003 and 2004.

### **NRC Question 2:**

2. How many waste shipments were made from the Palisades site in 2000, 2001, 2002, 2003 and 2004 and where were the shipments sent?

### **NMC Response to NRC Question 2:**

During the period 2000-2004, Palisades made an average of 16 shipments of LLW per year. Table 1(see attached) provides the number of waste shipments made per year from the Palisades site and locations of where the shipments were sent.

**NRC Question 4: (No Question 3 was provided)**

4. What were the quantities (in terms of volume and curie content) of LLW by class (A, B, and C) and mixed LLW generated during 2000, 2001, 2002, 2003, and 2004? What were the inventories stored on site at the end of each year? Where were they stored?

**NMC Response to NRC Question 4:**

The quantities of LLW generated in the years 2000-2004 are as follows (after volume reduction):

| Year              | Amount Generated  | Year-end Estimate Stored On-Site <sub>2</sub> | Storage Location               |
|-------------------|---|---|--------------------------------|
| 2000              | 2834 ft <sup>3</sup> total  | 7106 ft <sup>3</sup>                          | East Radwaste Storage Building |
| 2001              | 3185 ft <sup>3</sup> total  | 3357 ft <sup>3</sup>                          | East Radwaste Storage Building |
| 2002 <sub>1</sub> | Class A: 1784.7 ft <sup>3</sup><br>Class B: <u>145.8 ft<sup>3</sup></u><br>1930.5 ft <sup>3</sup> | 2860 ft <sup>3</sup>                          | East Radwaste Storage Building |
| 2003 <sub>1</sub> | Class A: 1214.0 ft <sup>3</sup><br>Class C: <u>180.1 ft<sup>3</sup></u><br>1394.1 ft <sup>3</sup> | 3230.2 ft <sup>3</sup>                        | East Radwaste Storage Building |
| 2004 <sub>1</sub> | Class A: 1400 ft <sup>3</sup><br>Class B: <u>100 ft<sup>3</sup></u><br>1500 ft <sup>3</sup>       | 4234 ft <sup>3</sup>                          | East Radwaste Storage Building |

<sub>1</sub> From Michigan Department of Environmental Quality Annual Low-Level Radioactive Waste Management Surveys.

<sub>2</sub> Year-end estimates include 1900 ft<sup>3</sup> of containment building concrete material (D-block) removed during steam generator replacement, currently stored adjacent to the Steam Generator Storage Building. This number was not accounted for in Palisades' Annual Low-Level Radioactive Waste Management Surveys to the Michigan Department of Environmental Quality, 2000-2004. The numbers provided here serve as an update to Question 14 A in Palisades' Annual Low-Level Radioactive Waste Management Surveys to the Michigan Department of Environmental Quality, 2000-2004.

Curie content of LLW generated is usually calculated during shipping; therefore, there is currently no estimate of the curie content of waste generated for each year.

Yearly volume estimates of LLW generated do not include 20,000 ft<sup>3</sup> designated for disposal of old steam generators, currently stored on-site in the Steam Generator Storage Building. Palisades' old steam generators (2) are designated as decommissioning disposal items.

No mixed waste was stored on the Palisades site from 2000-2004, nor is any stored at present. However, Palisades is permitted per the site Treatment Storage and Disposal (TSD) permit to store up to two 55-gallon drums of lead waste from plant operations (i.e. lead paint removal). The Low Level Mixed Waste Unit is located in the East Radwaste Storage Building, inside the Palisades owner controlled area.

**Table 1****January-December 2004**

| Waste Class  | Source of Waste                | Container Type           | Number of Shipments | Shipping Location           | Total Volume Released(ft <sup>3</sup> ) <sub>1</sub> | Total Curies (Ci) <sub>1</sub> | Principal Radionuclides <sub>1</sub>   |
|--------------|--------------------------------|--------------------------|---------------------|-----------------------------|--|--------------------------------|--|
| AS           | Evaporator Bottoms             | High Integrity Container | 3                   | Barnwell                    | 307.2  | 2.81                           | Co-60, Cs-137, Sb-125, Ni-63, Cs-134, Mn-54, Co-58, Fe-55, Ag-110m, Ru-106   |
| B            | Other Reformed Residue (Resin) | High Integrity Container | 1                   | Duratek                     | 2.7  | 3.246                          | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Cs-134, Zn-65, H-3 |
| C            | Other Reformed Residue (Resin) | High Integrity Container | 1                   | Studsvik                    | 42.5   | 41.2                           | Co-60, Ag-110m, Mn-54, Cs-137, Cs-134, Ni-63, Fe-55, H-3                     |
| AU           | Dry Active Waste               | Low Specific Activity    | 6<br>2<br>1         | Duratek<br>RACE<br>Studsvik | 143.8  | 0.606                          | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Ru-106, Pu-241     |
| <b>TOTAL</b> |                                |                          | <b>14</b>           |                             | <b>496.2</b>   | <b>47.862</b>                  |  |

<sub>1</sub> Data obtained from 2004 Radioactive Effluent Release Report, Attachment 4

**January-December 2003**

| Waste Class  | Source of Waste    | Container Type           | Number of Shipments | Shipping Location           | Total Volume Released(ft <sup>3</sup> ) <sub>1</sub> | Total Curies (Ci) <sub>1</sub> | Principal Radionuclides <sub>1</sub>   |
|--------------|--------------------|--------------------------|---------------------|-----------------------------|--|--------------------------------|--|
| AS           | Evaporated Bottoms | High Integrity Container | 1                   | Barnwell                    | 102.4  | 1.877                          | Co-60, Cs-137, Sb-125, Ni-63, Cs-134, Mn-54, Co-58, Fe-55, Ag-110m, Ru-106   |
| AS           | Dry Active Waste   | High Integrity Container | 1                   | Barnwell                    | 194.1  | 0.726                          | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55                     |
| C            | Resin              | High Integrity Container | 1                   | Studsvik                    | 9.3  | 6.23                           | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Cs-134, Zn-65, H-3 |
| C            | Filters            | High Integrity Container | 1                   | Barnwell                    | 170.8  | 3.287                          | Co-60, Ag-110m, Mn-54, Cs-137, Cs-134, Ni-63, Fe-55, H-3                     |
| AU           | Dry Active Waste   | LSA                      | 2<br>1<br>7         | RACE<br>Duratek<br>Studsvik | 557.4  | 0.37                           | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Ru-106, Pu-241     |
| <b>TOTAL</b> |                    |                          | <b>14</b>           |                             | <b>1034</b>  | <b>12.49</b>                   |  |

<sub>1</sub> Data obtained from 2003 Radioactive Effluent Release Report, Attachment 4

**Table 1 continued**

**January-December 2002**

| Waste Class  | Source of Waste    | Container Type           | Number of Shipments | Shipping Location                         | Total Volume Released(ft <sup>3</sup> ) <sub>1</sub> | Total Curies (Ci) <sub>1</sub> | Principal Radionuclides <sub>1</sub>   |
|--------------|--------------------|--------------------------|---------------------|---|--|--------------------------------|--|
| AS           | Evaporator Bottoms | High Integrity Container | 2                   | Barnwell                                  | 256  | 1.493                          | Co-60, Cs-137, Sb-125, Ni-63, Cs-134, Mn-54, Co-58, Fe-55                    |
| AS           | Dry Active Waste   | High Integrity Container | 1                   | Barnwell                                  | 194.1  | 0.555                          | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Ru-106, Pu-241     |
| B            | Resin              | High Integrity Container | 1                   | Barnwell                                  | 145.8  | 75.1                           | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Cs-134, Zn-65, H-3 |
| AU           | Dry Active Waste   | Low Specific Activity    | 2<br>2<br>1<br>1    | US Ecology<br>Duratek<br>Barnwell<br>RACE | 1334.6   | 0.291                          | Co-60, Cs-137, Sb-125, Ni-63, Sr-90, Mn-54, Co-58, Fe-55, Ru-106, Pu-241     |
| <b>TOTAL</b> |                    |                          | <b>10</b>           |   | <b>1930.5</b>  | <b>77.439</b>                  |  |

<sub>1</sub> Data obtained from 2002 Radioactive Effluent Release Report, Attachment 4

**January- December 2001**

| Waste Class  | Source of Waste    | Container Type           | Number of Shipments | Shipping Location     | Total Volume Released(ft <sup>3</sup> ) <sub>1</sub> | Total Curies (Ci) <sub>1</sub> | Principal Radionuclides <sub>1</sub>   |
|--------------|--------------------|--------------------------|---------------------|-----------------------|--|--------------------------------|--|
| AS           | Dry Active Waste   | High Integrity Container | 1                   | Barnwell              | 194.1  | 1.05                           | Co-60, Cs-137, Co-58, Cs-134, Mn-54, Fe-55, Nb-95, Ag-100m, Zr-95, Sb-125, Ni-63 |
| B            | Dry Active Waste   | High Integrity Container | 1                   | Barnwell              | 195.7  | 0.63                           | Same as above  |
| AU           | Dry Active Waste   | LSA                      | 17<br>4             | Duratek<br>US Ecology | 1638.8   | 0.47                           | Same as above  |
| AS           | Evaporated Bottoms | High Integrity Container | 3                   | Barnwell              | 256  | 4.25                           | Co-60, Cs-137, Co-58, Cs-134, Mn-54, Fe-55, Zn-65, Sb-125, Ni-63, Ag-110m        |
| <b>TOTAL</b> |                    |                          | <b>26</b>           |                       | <b>2284.6</b>  | <b>6.4</b>                     |  |

<sub>1</sub> Data Obtained from 2001 Radioactive Effluent Release Report, Attachment 4

**Table 1 continued**

**January-December 2000**

| <b>Waste Class</b> | <b>Source of Waste</b> | <b>Container Type</b>    | <b>Number of Shipments</b> | <b>Shipping Location</b> | <b>Total Volume Released(ft<sup>3</sup>)<sub>1</sub></b> | <b>Total Curies (Ci)<sub>1</sub></b> | <b>Principal Radionuclides<sub>1</sub></b>                                       |
|--------------------|------------------------|--------------------------|----------------------------|--------------------------|--|--------------------------------------|--|
| AS                 | Dry Active Waste       | High Integrity Container | 3                          | Barnwell                 | 362.1  | 1.4                                  | Co-60, Cs-137, Co-58, Cs-134, Mn-54, Fe-55, Cr-51, Ag-110m, Zr-95, Ce-144, Ni-63 |
| AU                 | Dry Active Waste       | LSA                      | 11                         | Duratek                  | 1313.7   | 0.3                                  | Same as above  |
| AS                 | Evaporated Bottoms     | High Integrity Container | 1                          | Barnwell                 | 102.4  | 0.5                                  | Co-60, Cs-137, Co-58, Cs-134, Mn-54, Fe-55                                       |
| AS                 | Resins                 | High Integrity Container | 1                          | Barnwell                 | 132.4  | 3.3                                  | Cs-137, H-3, Cs-134  |
| C                  | Resins                 | High Integrity Container | 1                          | Barnwell                 | 132.4  | 188                                  | Cs-137, Co-60  |
| C                  | Irradiated Hardware    | Steel Liner              | 1                          | Barnwell                 | 14.6   | 8360                                 | Co-60, Co-58, Mn-54, Fe-55, Ni-63, Ni-59   |
| <b>TOTAL</b>       |                        |                          | <b>18</b>                  |                          | <b>2057.6</b>  | <b>8553.5</b>                        |  |

<sub>1</sub> Data Obtained from 2000 Radioactive Effluent Release Report, Attachment 4