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Mr. Stuart A. Richards, Deputy Director  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
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Prairie Island Nuclear Generating Plant  
Units 1 and 2  
Dockets 50-282 and 50-306  
License Nos. DPR-40 and DPR-60

Point Beach Nuclear Plant  
Units 1 and 2  
Dockets 50-266 and 50-301  
License Nos. DPR-24 and DPR-27

Monticello Nuclear Generating Plant  
Docket 50-263  
License No. DPR-22

Palisades Nuclear Plant  
Docket 50-255  
License No. DPR-20

Groundwater Protection – Data Collection Questionnaire

The nuclear industry, in conjunction with the Nuclear Energy Institute, has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with NRC. The completed questionnaires for the above listed sites operated by Nuclear Management Company, LLC are enclosed.

This submittal contains no new regulatory commitments.



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Enclosures

cc: Document Control Desk  
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## ENCLOSURE 1

### INDUSTRY GROUNDWATER PROTECTION INITIATIVE VOLUNTARY DATA COLLECTION QUESTIONNAIRE

#### PRAIRIE ISLAND NUCLEAR GENERATING PLANT

The Nuclear Energy Institute has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with the NRC. The completed questionnaire for Prairie Island Nuclear Generating Plant (PINGP) follows.

1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.
  - The PINGP has a leakage detection system installed in the annulus of the double-walled liquid radioactive waste discharge line. Leaks into the annulus are detected and location identified using this system.
  - The PINGP has a Spent Fuel Leakage Detection system which is used to monitor for leakage from the spent fuel pool.
  - Engineers perform periodic walkdowns of the systems for which they are responsible. These walkdowns include the requirement to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Operations personnel conduct shiftly walkdowns of plant systems and are required to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - The site corrective action program is used for reporting and trending leaks and spills. The process facilitates anonymous reporting.
2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.
  - PINGP has a special tritium sampling program in addition to that of the Radiological Environmental Monitoring Program (REMP) and consists of the following:

- Twenty-two onsite groundwater monitoring wells surrounding the plant
  - Seven offsite residential groundwater wells
  - Five surface water sample locations
  - All samples analyzed to a Minimum Detectable Activity (MDA) of 19 pCi/L
  - All locations sampled annually and four locations sampled quarterly
- PINGP has a water sampling program as part of the REMP that consists of the following:
    - Six onsite and offsite drinking water wells
    - Two surface water sample locations
    - The surface water locations and one drinking water well are sampled weekly, the other five wells are sampled quarterly
    - All samples are analyzed for radionuclides with the following MDAs.

Nuclide	Typical MDA (pCi/l)
<sup>3</sup> H	500
<sup>54</sup> Mn	10
<sup>59</sup> Fe	30
<sup>58</sup> Co	10
<sup>60</sup> Co	30
<sup>65</sup> Zn	10
<sup>95</sup> Zr-Nb	15
<sup>134</sup> Cs	10
<sup>137</sup> Cs	10
<sup>140</sup> Ba-La	15
<sup>144</sup> Ce	40

3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).
  - Elevated levels of tritium, which were below U.S. EPA drinking water limits, were detected in a nearby residence well in 1989. Evaluation of this incident indicated that the source of the groundwater tritium was from planned discharges of liquid radioactive waste that seeped from the discharge canal and possibly leaked from the liquid radioactive waste discharge piping.
  - Low levels of Co-60, Cs-134, and Cs-137 were found in 1992 when sampling an area where high turbidity water is discharged from the turbine building sump. The contaminated area was inside the owner controlled area.
4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of

radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the U.S. EPA for drinking water.

Not applicable. No groundwater monitoring results have exceeded the maximum contaminant levels established by the U.S. EPA for drinking water.

5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.
  - The 1989 discharge canal and liquid radioactive seepage was remediated in 1991 by installing a double-walled discharge pipe. The pipe extended the discharge of liquid radioactive waste near the outfall of the discharge canal to reduce the residence time of the tritium in the discharge canal and minimize any underground leakage from the discharge piping. A special groundwater monitoring program was initiated after the repairs. Regular samplings of groundwater on and off the site are significantly below the limit established by the U.S. EPA for drinking water.
  - In 1998, contaminated soil from the turbine building sump discharge area event of 1992 was removed and shipped for radioactive disposal.

## ENCLOSURE 2

### INDUSTRY GROUNDWATER PROTECTION INITIATIVE VOLUNTARY DATA COLLECTION QUESTIONNAIRE

#### POINT BEACH NUCLEAR PLANT

The Nuclear Energy Institute has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with the NRC. The completed questionnaire for Point Beach Nuclear Plant (PBNP) follows.

1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.
  - Storm drains are sampled monthly as part of the Radiological Effluent Control Program (RECP).
  - Lake water and well water samples and vegetation samples are obtained within the owner controlled area as part of the Radiological Effluent Monitoring Program (REMP).
  - Engineers perform periodic walk downs of the systems for which they are responsible. These walkdowns include the requirement to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Operations personnel conduct shiftly walkdowns of plant systems and are required to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Chemistry and Radiation Protection (RP) personnel perform on the job observations and are trained to report spills.
  - PBNP has a Spent Fuel Leakage Detection system which is used to monitor for leakage from the spent fuel pool.
  - Tanks that contain radionuclides have level monitoring gauges and alarms. This would provide indication of leakage from the tank.

- Tanks containing radioactive liquids at PBNP are located within the plant; there are no outside radioactive liquid storage tanks. The former retention pond has been remediated as described in Item 5 and monitoring continues as described in Item 2.
  - The site corrective action program is used for reporting and trending leaks and spills. The process facilitates anonymous reporting.
2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.
- Intermittent streams are sampled monthly for tritium to monitor the status of existing groundwater tritium concentrations associated with the remediated retention pond.
  - Three onsite potable wells are periodically sampled. The Energy Information Center well is sampled monthly; the others are sampled quarterly.
  - Tritium lower limits of detection (LLDs) are set at a fraction of the U.S. Environmental Protection Agency (EPA) drinking water standard.
  - Typical LLDs for well and stream samples are listed below.

Nuclide	Typical LLD (pCi/l)
<sup>3</sup> H	200
<sup>54</sup> Mn	15
<sup>59</sup> Fe	30
<sup>58</sup> Co/ <sup>60</sup> Co	15
<sup>65</sup> Zn	30
<sup>95</sup> Zr-Nb	15
<sup>131</sup> I	2
<sup>134</sup> Cs	15
<sup>137</sup> Cs	18
<sup>140</sup> Ba-La	15
<sup>89</sup> Sr	10
<sup>90</sup> Sr	2

3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).
- During 1975, a steam generator tube rupture resulted in a release of about 10,000 gallons of low level contaminated water, which included tritium, to the onsite retention pond. Some of this leaked into the upper surface aquifer through

the earthen pond sides before the pond was remediated. Also, some of this water was released via the approved effluent discharge pathway.

- In 1997, the buried discharge line to the retention pond developed a leak sending sewage treatment plant and secondary side sump water into the ground, where it welled up to the surface. This water contained slight amounts of radioactivity. Most of this water ran into the intermittent stream on the east side of the sewage treatment plant and then into Lake Michigan.
4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the U.S. EPA for drinking water.

Not applicable. No groundwater monitoring results have exceeded the maximum contaminant levels established by the U.S. EPA for drinking water.

5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.

The retention pond was closed and remediated to a fraction of the NRC unrestricted access dose guideline of 25 mrem/year. All Cs-137 contaminated soil outside the pond was remediated to produce residual Cs-137 levels below the NRC generic decommissioning screening level for unrestricted access.

A large segment of the buried discharge line to the retention pond that leaked in 1997 was replaced. The stream is now sampled monthly and tritium levels are significantly below the limit established by the U.S. EPA for drinking water.



## ENCLOSURE 3

### INDUSTRY GROUNDWATER PROTECTION INITIATIVE VOLUNTARY DATA COLLECTION QUESTIONNAIRE

#### MONTICELLO NUCLEAR GENERATING PLANT

The Nuclear Energy Institute has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with NRC. The completed questionnaire for Monticello Nuclear Generating Plant (MNGP) follows.

1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.
  - Permanent outdoor radioactive water storage tanks at MNGP (condensate water) are located within a basin designed to contain leakage. Leakage from the tanks would be detected either visually or during routine sampling and analysis, which is performed prior to periodic removal of accumulated precipitation.
  - The MNGP spent fuel pool has a leak detection system that includes a skimmer surge tank low level alarm, a fuel pool low level alarm, and an inspection of the fuel pool liner drains once per shift.
  - Engineers perform periodic walk downs of the systems for which they are responsible. These walkdowns include the requirement to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Operations personnel conduct shiftly walkdowns of plant systems and are required to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - The site corrective action program is used for reporting and trending leaks and spills. The process facilitates anonymous reporting.
  - The Radiological Environmental Monitoring Program (REMP) includes periodic sampling and analysis of onsite and offsite groundwater wells.

2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.

- MNGP has one onsite groundwater monitoring well, which is sampled as part of the REMP. This well is one of several that supply water for employee consumption.
- In addition, MNGP samples two offsite groundwater wells (one residential and one public) as part of the REMP.
- The wells are sampled quarterly and analyzed for gamma-emitting radionuclides and tritium.
- The samples are analyzed to the site's REMP criteria.
- Typical sample Minimum Detectable Activities (MDAs) are as follows.

Nuclide	Typical MDA (pCi/l)
<sup>3</sup> H	500
<sup>54</sup> Mn	10
<sup>59</sup> Fe	30
<sup>58</sup> Co/ <sup>60</sup> Co	10
<sup>65</sup> Zn	30
<sup>95</sup> Zr-Nb	15
<sup>131</sup> I	1
<sup>134</sup> Cs/ <sup>137</sup> Cs	10
<sup>140</sup> Ba-La	15

3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).

Not applicable. There are no inadvertent releases of radioactive liquids documented in accordance with 10 CFR 50.75(g).

4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the U.S. EPA for drinking water.

Not applicable. No groundwater monitoring results have exceeded the maximum contaminant levels established by the U.S. EPA for drinking water.

5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.

Not applicable. No remediation efforts have been planned or undertaken to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.

## ENCLOSURE 4

### INDUSTRY GROUNDWATER PROTECTION INITIATIVE VOLUNTARY DATA COLLECTION QUESTIONNAIRE

#### PALISADES NUCLEAR PLANT

The Nuclear Energy Institute has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with the NRC. The completed questionnaire for Palisades Nuclear Plant (PNP) follows.

1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.
  - The PNP spent fuel pool (SFP) consists of a stainless steel liner surrounded by several feet of concrete. Leak chases are located between the stainless steel liner and the concrete. The leak chases route any leakage past the liner to a monitored drain system (commonly referred to as tell tale drains). If the SFP were to leak past the concrete liner, leakage should be contained in the auxiliary building.
  - Engineers perform periodic walk downs of the systems for which they are responsible. These walkdowns include the requirement to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Operations personnel conduct shiftly walkdowns of plant systems and are required to identify and report leaks and spills. Leaks and spills are addressed through any of the following: decontamination, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Other periodic inspections and walk downs include personnel from Engineering, Chemistry and Radiological Protection and Security Departments.
  - Tanks that contain radionuclides have continuous level monitoring and recording capabilities.
  - The site corrective action program is used for reporting and trending leaks and spills. The process facilitates anonymous reporting.

2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.
  - There are three monitoring wells located around the interim steam generator building, which houses two steam generators, and are sampled quarterly per the Radiological Effluent Monitoring Program (REMP).
  - The table below lists the required lower limit of detection (LLD) that the vendor will achieve for liquid environmental samples.

Nuclide	Typical LLD (pCi/l)
<sup>3</sup> H	500
Gross Beta	4
<sup>89</sup> Sr	5
<sup>90</sup> Sr	1
<sup>131</sup> I	1
<sup>134</sup> Cs	15
<sup>137</sup> Cs	18
<sup>140</sup> Ba-La	15

3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).
  - The utility water storage tank (T-91) leaked 2,790 gallons of processed liquid radioactive waste from a flange onto the ground, with some seepage through the wall of the vault below ground level. This event is documented in the 10 CFR 50.75(g) file.
  - The 10 CFR 50.75(g) file also contains reports that describe historical cooling tower overflow incidents. The non-radioactive circulating water subsequently flowed through the south storage building, which contained radiologically contaminated equipment. Surveys confirmed that the surface contamination was to a depth of approximately six inches. The soils in the affected area were retained in accordance with approval from the NRC per 10 CFR 20.302.
4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the U.S. EPA for drinking water.

Not applicable. No groundwater monitoring results have exceeded the maximum contaminant levels established by the U.S. EPA for drinking water.

5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.
- The utility water storage tank release summarized in question 3, and referenced in the 10 CFR 50.75 (g) file, was remediated by removing approximately six inches of soil from the surface. Approval was obtained for disposal per 10 CFR 20.2002.
  - The cooling tower overflow incidents, which flooded the south storage building containing radiologically contaminated equipment, was remediated by retaining the majority of the 4,200 cubic feet of affected soil in accordance with 10 CFR 20.302.