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NUCLEAR REGULATORY COMMISSION
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December 17, 2017

Dana Stalcup, Director
Division of Assessment and Remediation
Office of Superfund Remediation
and Technology
U.S. EPA
1200 Pennsylvania Ave., NW
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Washington, DC 20460

SUBJECT: CONSULTATION ON THE DECOMMISSIONING OF THE LA CROSSE BOILING WATER REACTOR IN GENOA, WISCONSIN

Dear Mr. Stalcup:

This letter notifies you of the decommissioning oversight actions that the U.S. Nuclear Regulatory Commission (NRC) has taken and intends to take for the La Crosse Boiling Water Reactor (LACBWR) in Genoa, Wisconsin.

On October 9, 2002, the NRC and the U.S. Environmental Protection Agency (EPA) entered into a Memorandum of Understanding (MOU) on "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites." Under the MOU, the EPA agreed to continue its deferral policy of not listing sites on the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) National Priorities List that are subject to the NRC's licensing authority. The MOU provides that, unless an NRC-licensed site exceeds any of three trigger criteria contained in the MOU, the EPA agrees to a policy of deferral to NRC decision-making on decommissioning without the need for consultation.

For sites that trigger the criteria in the MOU, the NRC will consult with the EPA at two points in the decommissioning process: (1) prior to NRC approval of the License Termination Plan (LTP) or decommissioning plan, which the NRC terms Level 1 consultation; and (2) following completion of the Final Status Survey (FSS), which the NRC terms Level 2 consultation. We are sending this letter as our Level 1 consultation for the LACBWR site because the licensee's proposed Derived Concentration Guideline Levels (DCGLs) for radionuclides at this site exceed the soil concentration values in Table 1 of the MOU.

LACBWR was an Atomic Energy Commission (AEC) Demonstration Project Reactor that first went critical in 1967, commenced commercial operation in November 1969, and was capable of producing 50 megawatts of electricity. LACBWR is located on the east bank of the Mississippi River in Vernon County, Wisconsin, about 1 mile south of the Village of Genoa, Wisconsin and approximately 19 miles south of the city of La Crosse, Wisconsin, and is co-located with the Genoa Generating Station (Genoa 3), which is a coal-fired power plant that is still in operation. The Allis-Chalmers Company was the original licensee of LACBWR; the AEC later sold the plant to the Dairyland Power Cooperative (DPC) and granted it Provisional Operating License No. DPR-45 on August 28, 1973.

LACBWR permanently ceased operations on April 30, 1987, and reactor defueling was completed on June 11, 1987. In a letter dated August 4, 1987, the NRC terminated DPC's authority to operate LACBWR, and granted the licensee a possess-but-not-operate status. By letter dated August 18, 1988, the NRC amended DPC's license to reflect the permanently defueled configuration at LACBWR. Therefore, pursuant to Paragraph (a)(1)(iii) and Paragraph (a)(2) in Section 50.82, "Termination of license," of Title 10 of the *Code of Federal Regulations* (10 CFR), DPC's Possession Only License does not authorize operation of LACBWR or emplacement or retention of fuel into the reactor vessel.

The NRC issued an order to authorize decommissioning of LACBWR and approve the licensee's proposed Decommissioning Plan (DP) on August 7, 1991. Because the NRC approved DPC's DP before August 28, 1996 (the effective date of an NRC final rule concerning reactor decommissioning (61 FR 39278; July 29, 1996)), the DP is considered the Post-Shutdown Decommissioning Activities Report (PSDAR) for LACBWR (see 10 CFR 50.82). The PSDAR public meeting was held on May 13, 1998, and subsequent updates to the LACBWR decommissioning report have combined the DP and PSDAR into the "LACBWR Decommissioning Plan and Post-Shutdown Decommissioning Activities Report" (D-Plan/PSDAR). DPC constructed an onsite Independent Spent Fuel Storage Installation (ISFSI) and completed the movement of all 333 spent nuclear fuel elements from the Fuel Element Storage Well to dry cask storage at the ISFSI by September 19, 2012. The remaining associated buildings and structures are ready for dismantlement and decommissioning.

By order dated May 20, 2016, the NRC approved the direct transfer of Possession Only License No. DPR-45 for LACBWR from DPC to LaCrosse*Solutions*, LLC (LS), a wholly-owned subsidiary of Energy*Solutions*, LLC, and approved a conforming license amendment, pursuant to 10 CFR 50.80, "Transfer of licenses," and 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit." The order was published in the *Federal Register* on June 2, 2016 (81 FR 35383). The transfer assigns DPC's licensed possession, maintenance, and decommissioning authorities for LACBWR to LS in order to implement expedited decommissioning at the LACBWR site. Final decommissioning activities at LACBWR are currently underway and are scheduled to be completed in 2018.

By letter dated June 27, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16200A095), as supplemented by letter dated December 1, 2016 (ADAMS Accession No. ML16347A026), LS submitted the LTP for LACBWR in accordance with 10 CFR 50.82(a)(9). The LTP includes a site characterization to ensure that final radiation surveys (FRS) cover all areas where contamination existed, remains, or has the potential to exist or remain; identification of remaining dismantlement activities; plans for site remediation; a description of the FRS plan to confirm that LACBWR will meet the release criteria in Subpart E, "Radiological Criteria for License Termination," of 10 CFR Part 20, "Standards for Protection Against Radiation;" dose-modeling scenarios that ensure compliance with the radiological criteria for license termination; an estimate of the remaining site-specific decommissioning costs; and a supplement to the environmental report describing any new information or significant environmental changes associated with proposed license termination activities. The NRC staff is currently reviewing the LACBWR LTP.

LS is proposing to decontaminate the LACBWR site to meet the requirements for unrestricted use under 10 CFR 20.1402, "Radiological criteria for unrestricted use." The licensee is using an industrial use scenario because the site has been continuously used for industrial purposes

since 1941. Due to the presence of the Genoa 3 facility and supporting operations (e.g., barge washing, switchyard) on the property, the presence of the ash landfills, as well as the onsite ISFSI, it is anticipated that the LACBWR site will continue as an industrial use property after decommissioning is completed. The NRC has compared the licensee's proposed DCGLs to the EPA MOU's soil concentration levels for the industrial use scenario for the purposes of evaluating the need for consultation.

The proposed DCGLs for LACBWR are provided in the enclosure. The DCGLs for all three of the proposed radionuclides of concern (ROC) at LACBWR exceed the MOU soil concentration levels for the industrial use scenario. A listing of the initial suite of radionuclides considered by the licensee, as well as the associated DCGLs as compared to the MOU soil concentration levels, is also included for reference. These DCGL values help to determine whether the associated radionuclides are considered significant, and also the amount that the adjusted DCGLs for the ROCs will be reduced during the FSS to account for all other radionuclides which may be present but will not specifically be addressed in the FSS.

The NRC staff notes that in determining the Level 1 consultation trigger soil concentrations, the sum of fractions approach was applied for all radionuclides other than radium-226, thorium-232, and total uranium. The sum of fractions for the three ROCs, assuming the proposed surface soil DCGL values for LACBWR, is 299, and the sum of fractions for the initial suite of considered radionuclides is 12787. Prior to the NRC's termination of the license, the licensee must show that the LACBWR site will be in compliance with the NRC's criteria in 10 CFR 20.1402.

The criteria in 10 CFR 20.1402 provide that the licensee must demonstrate, through its FSS in accordance with 10 CFR 50.82(a)(11)(ii), that the residual radioactivity, distinguishable from background radiation, results in an all-pathways total effective dose equivalent to an average member of the critical group does not exceed 0.25 millisieverts per year (25 millirem per year). In addition, the 10 CFR 20.1402 criteria require that the residual radioactivity be reduced to levels that are As Low As Reasonably Achievable (ALARA). The dose criteria in 10 CFR 20.1402 are fully protective of the public health and safety, and were the result of a comprehensive rulemaking (62 FR 39058; July 21, 1997), including an accompanying generic environmental impact statement.

Individuals at a decommissioned site are expected to receive doses substantially below the constraint level because of the application of the ALARA principle, conservative dose modeling assumptions, and the nature of the cleanup process itself, which often reduces residual contamination levels significantly below site DCGLs. Additionally, the residual radioactivity at the site is expected to be much lower than the DCGL values because meeting the "not to exceed 25 millirem per year" criteria must be demonstrated using an all pathways, sum of fractions approach. Each individual DCGL represents a concentration level corresponding to 25 millirem per year. Thus, in applying the sum of fractions requirement, the actual cleanup values will be reduced to ensure that the potential dose from all residual radioactivity at the site from all media is less than 25 millirem per year.

Onsite monitoring wells have been sampled as part of an ongoing groundwater monitoring program since 2012. There have been sample results in groundwater monitoring wells that have detected tritium (H-3) and strontium-90 above the detection limit but well below the EPA Maximum Contaminant Level (MCL) for each of those radionuclides. Other radionuclides were found at low but detectable levels. There is some uncertainty, however, suggested by

(1) groundwater sampling in a temporary well downgradient of a spill that found the cobalt-60 level in 1983 above the relevant MCL, and (2) plans in the LTP for future groundwater and soil sampling below yet-to-be demolished buildings with histories of spills. Therefore, the NRC is not requesting a consultation on groundwater at this time, but may request Level 2 consultation if warranted by results from future sampling below structures as demolition occurs.

Following your staff's review of the enclosure and other relevant information, as specified in Section V.D.1 of the MOU, please send us your views on the LACBWR site within 90 days of receiving this notification.

As part of the LTP review and approval process, the NRC staff will prepare an Environmental Assessment, which will be published in the *Federal Register*. The staff anticipates approving the LTP at the conclusion of the consultation process. Following site remediation activities, the licensee will submit an FSS. The NRC staff will review the information contained in this survey report and will compare the remaining levels of residual radioactivity to the MOU trigger levels. If the FSS measurements show that the remaining radionuclide concentrations are below the values set forth in Table 1 of the MOU as well as the final approved DCGL values, then the NRC will proceed to terminate the LACBWR license and the site will be released for unrestricted use. The NRC will inform the EPA of such findings. If the FSS measurements show that any of the remaining radionuclide concentrations are above the values set forth in Table 1 of the MOU, then the NRC will engage in Level 2 consultation with the EPA to identify and resolve any remaining issues.

In the meantime, if you have any questions regarding this letter or the remediation activities at the LACBWR site please contact Mr. Bruce Watson, CHP, Chief of the NRC's Reactor Decommissioning Branch, at (301) 415-6221.

Sincerely,

/RA/

John R. Tappert, Director
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos.: 50-409 and 72-046
License No.: DPR-45

Enclosure: LACBWR Proposed Cleanup Values

cc: La Crosse Boiling Water
Reactor Service List w/ Enclosure

SUBJECT: CONSULTATION ON THE DECOMMISSIONING OF THE LA CROSSE BOILING WATER REACTOR IN GENOA, WISCONSIN **[DOCUMENT DATE] DECEMBER 17, 2017**

DISTRIBUTION: M. Kunowski, RIII P. Lee, RIII R. Edwards, RIII

ADAMS Accession No. ML17047A604

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Enclosure

La Crosse Boiling Water Reactor
Proposed Soil Cleanup Values (DCGLs) (pCi/g)
for Proposed Radionuclides of Concern (ROC)

Radionuclide of Concern (ROC)	Surface Soil (DCGL in pCi/g)	EPA MOU Industrial (in pCi/g)
Cobalt-60	**13**	**6**
Cesium-137	**58**	**11**
Strontium-90	**6577**	**1070**

NOTE: DCGLs are not adjusted for the radionuclides which the licensee is proposing are insignificant (i.e, representing less than 10 percent of the dose criteria).

La Crosse Boiling Water Reactor
Proposed Soil Cleanup Values (DCGLs) (pCi/g)
for Initial Suite of Radionuclides Considered at LACBWR

Radionuclide Considered	Surface Soil (DCGL in pCi/g)	EPA MOU Industrial (in pCi/g)
H-3	**5.35E+06**	**4.23E+02**
C-14	**6.77E+06**	**1.23E+05**
Fe-55	**1.02E+07**	**2.21E+06**
Ni-59	**2.60E+07**	**1.23E+06**
Co-60	**1.28E+01**	**6.00E+00**
Ni-63	**9.50E+06**	**5.55E+05**
Sr-90	**6.58E+03**	**1.07E+03**
Nb-94	**2.02E+01**	**3.00E+00**
Tc-99	2.01E+03	8.94E+04
Cs-137	**5.81E+01**	**1.10E+01**
Eu-152	**2.84E+01**	**7.00E+00**
Eu-154	**2.64E+01**	**8.00E+00**
Eu-155	1.12E+03	N/A
Pu-238	**1.69E+03**	**1.64E+03**
Pu-239	**1.52E+03**	**1.43E+03**
Pu-240	1.53E+03	N/A
Pu-241	3.69E+04	1.72E+05
Am-241	**1.11E+03**	**5.68E+02**
Am-243	1.87E+02	N/A
Cm-243	**2.89E+02**	**6.70E+01**
Cm-244	2.72E+03	N/A

NOTE: DCGLs in **bold** are those that exceed the consultation trigger limits from the EPA MOU Table 1 soil concentrations for the industrial use scenario.

Enclosure

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