

**LA CROSSE BOILING WATER REACTOR
LICENSE TERMINATION PLAN
CHAPTER 1, REVISION 3
GENERAL INFORMATION**

TABLE OF CONTENTS

1. General Information.....	1-1
1.1. Purpose.....	1-1
1.2. Decommissioning Objective	1-1
1.3. Facility.....	1-2
1.3.1. Site Description.....	1-2
1.3.2. Current/Future Land Use	1-3
1.3.3. Meteorology and Climatology	1-3
1.3.4. Geology and Seismology	1-3
1.3.5. Surface Water Hydrology	1-4
1.3.6. Ground Water Hydrology	1-5
1.3.7. Environs and Natural Resources.....	1-5
1.4. Operational Background	1-6
1.5. Plan Summary	1-7
1.5.1. General Information.....	1-7
1.5.2. Site Characterization.....	1-7
1.5.3. Identification of Remaining Site Dismantlement Activities.....	1-8
1.5.4. Remediation Plans	1-8
1.5.5. Final Status Survey Plan	1-9
1.5.6. Compliance with the Radiological Criteria for License Termination.....	1-9
1.5.7. Update of the Site-Specific Decommissioning Costs	1-9
1.5.8. Supplement to the Environmental Report.....	1-9
1.6. Regulatory Notifications of Changes	1-10
1.7. References	1-11

LIST OF FIGURES

Figure 1-1	Site Regional Location.....	1-13
Figure 1-2	Site Overview.....	1-14
Figure 1-3	LACBWR Buildings.....	1-15
Figure 1-4	Topographical Map.....	1-16

LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
AMCG	Average Member of the Critical Group
AMSL	Above Mean Sea Level
BGS	Below Ground Surface
DCGL	Derived Concentration Guideline Level
DQO	Data Quality Objectives
DSAR	Defueled Safety Analysis Report
FSS	Final Status Survey
GWH	Gigawatt-Hours
ISFSI	Independent Spent Fuel Storage Installation
LACBWR	La Crosse Boiling Water Reactor
LSA	Low Specific Activity
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MYBP	Million Years Before Present
NRC	Nuclear Regulatory Commission
ODCM	Off-Site Dose Calculation Manual
PSDAR	Post-Shutdown Decommissioning Activities Report
RESRAD	RESidual RADioactive Materials
USACE	US Army Corp of Engineers

1. General Information

The La Crosse Boiling Water Reactor (LACBWR) was a 50 Megawatt Electric (MWe) BWR that is owned by Dairyland Power Cooperative (Dairyland). This unit, also known as Genoa 2, is located on the Dairyland Genoa site on the east shore of the Mississippi River south of the Village of Genoa, Vernon County, Wisconsin with an address of:

LACBWR
S4601 State Road 35
Genoa, WI. 54632-8846

The site is licensed under Possession Only License No. DPR-45 with Docket Numbers of 50-409 for LACBWR and 72-046 for the Independent Spent Fuel Storage Installation (ISFSI).

LACBWR has been shut down since 1987 and is currently undergoing decommissioning. The spent nuclear fuel stored in the LACBWR ISFSI will be maintained under an amended Part 50 license.

In a letter dated October 8, 2015 (1), Dairyland and LaCrosseSolutions, LLC (Solutions) requested Nuclear Regulatory Commission (NRC) consent to transfer Dairyland's possession, maintenance and decommissioning authorities, under Possession Only License No. DPR-45, from Dairyland to Solutions. In May 2016, the NRC provided consent to transfer the license to Solutions.

1.1. Purpose

The objective of decommissioning LACBWR is to reduce the residual radioactivity to levels that permit the release of the site for unrestricted use and allow for the termination of the 10 CFR Part 50 license except for the area surrounding the ISFSI. The ISFSI facility is licensed under the general license provisions of 10 CFR 72 Subpart K.

This License Termination Plan (LTP) satisfies the requirement of 10 CFR 50.82(a)(9). This LTP was written following the guidance in Regulatory Guide 1.179, *Standard Format and Contents for License Termination Plans for Nuclear Power Reactors* (2) and in NUREG-1700, *Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans* (3). This LTP is accompanied by a proposed license amendment that establishes the criteria for when changes to the LTP require NRC prior approval.

1.2. Decommissioning Objective

The decommissioning objective is to conduct remediation and survey operations such that LACBWR can submit a request to the NRC for unrestricted release of the site (other than the remaining ISFSI licensed facility) in accordance with Subpart E of 10 CFR Part 20 after meeting the requirements of 10 CFR 20.1402, *Radiological Criteria for Unrestricted Use*. The LTP documents the process that will be used to demonstrate that the dose from residual radioactivity that is distinguishable from background radioactivity does not exceed 25 mrem/year to the Average Member of the Critical Group (AMCG) from all applicable pathways over a 1,000 year period and that residual radioactivity has been reduced to levels that are "As Low As Reasonably Achievable" (ALARA).

1.3. Facility

1.3.1. Site Description

LACBWR is located in southwestern Wisconsin, in Vernon County, on the east shore of the Mississippi River, about 1 mile south of the Village of Genoa, WI and approximately 19 miles south of the city of La Crosse, WI. See Figure 1-1 for a map showing the site location, including nearby prominent features such as highways, rivers and lakes. The map coordinates for LACBWR are longitude 91°, 13', 53.35" West and latitude 43°, 33', 36.22" North. The site is at mile 678.6 on the Mississippi River above the mouth of the Ohio River. The reactor is approximately 300 feet from the Mississippi River and 475 feet west of the cargo-carrying-only rail road. The reactor stands on filled land at an elevation of 639 feet Above Mean Sea Level (AMSL) per NUREG-0191, *Environmental Statement related to Operation of the La Crosse Boiling Water Reactor* (4).

The licensed site comprises a total of 163.5 acres (5) which is owned by Dairyland, with LACBWR comprising only 1.5 acres. The site is accessed by a road on the south side of the plant, off of Highway 35. The prominent features on the site are shown in Figures 1-2 and 1-3 and include:

- the former LACBWR plant,
- the land north of LACBWR, including the site switchyard and the site of the former G-1 coal (and later oil) fueled power plant (removed in 1989),
- an area directly south of LACBWR with an operational 350-Mwe fossil generating station (Genoa Station #3) approximately 175 feet from the former LACBWR plant,
- an area south of Genoa #3 where the ISFSI is located, and
- a parcel of land to the east of Highway 35, across from LACBWR.

The initial survey unit boundaries and classifications shown in Figure 1-3 were developed for characterization and decommissioning planning purposes. As decommissioning proceeds, the survey unit boundaries and classifications may require revision due to the impact from remediation or continuing characterization activities, typically to a more conservative classification such as the recent change to survey unit L4012103 due to the new stack exclusion area. Any such changes to a more conservative classification or to the survey unit boundaries in Figure 1-3 as decommissioning proceeds will be addressed through procedural process in accordance with LTP Chapter 5.

The site is bordered on the north by the Mississippi River and a narrow strip of land between the Mississippi River and Highway 35. The U.S. Lock & Dam No. 8 is located approximately 0.6 miles upstream, managed by the U.S. Army Corp of Engineers (USACE), Rock Island District. The site is bordered on the west by the Mississippi River and is bordered on the east by Highway 35. A Burlington Northern-Santa Fe rail line, located between the site and Highway 35 carries commercial freight along the eastern portion of the site; there are no passenger trains which use this rail line. The site is bordered to the south by a segment of the Upper Mississippi River National Wildlife & Fish Refuge Pool 9 area. Further south, approximately 2.4 miles from LACBWR, is the Genoa National Fish Hatchery which raises endangered mussels, brook trout and sturgeon. On the southwestern corner of the site, approximately 0.75 miles south of the former LACBWR plant, is a public boat launching ramp with a parking lot.

1.3.2. Current/Future Land Use

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 on-site ISFSI, it is anticipated that the site will continue as an industrial-use property after decommissioning is completed. No other credible future land use, other than perhaps recreational, can be envisioned over the next several decades. The spent nuclear fuel is expected to remain at the ISFSI until a federal repository, offsite interim storage facility, or licensed temporary monitored retrievable storage facility is established and ready to receive LACBWR fuel.

1.3.3. Meteorology and Climatology

The La Crosse Municipal Airport located in the town of La Crosse and the USACE Lock 8 Dam in Genoa maintain long standing active weather stations that monitor and archive standard weather related information in the La Crosse – Genoa region of the Mississippi River. Collected data includes: wind speed and direction, temperature, and precipitation (6) (7).

Temperatures in the La Crosse region are typical of the extremes of a continental climate with the extremes being more marked because of the river valley location of the LACBWR Site. Average temperatures range from 20 °F in the three months of the winter season to 72 °F in the summer season. A record maximum temperature of 108 °F was recorded in July of both 1936 and 1995. The record low was -43 °F in January of 1873.

Monthly precipitation averages in the area ranges from three to five inches per month in the spring and summer seasons and one to three inches per month for the rest of the year.

The bluffs of the Mississippi River Valley channel the winds at the LACBWR Site. Airport data shows prevailing southerly winds for seven months of the year with prevailing north to northwest winds for the months of November through March of the year. Predominant winds at the LACBWR Site where the river valley runs north-south are from the north and south. Monthly average wind speeds are typically 6-10 mph.

1.3.4. Geology and Seismology

LACBWR is located within the Wisconsin Driftless section of the Central Lowland physiographic province. The Wisconsin Driftless section was not glaciated during the Pleistocene Epoch and is characterized by flat lying naturally dissected sedimentary rocks of early Paleozoic age. Moderate to strong relief has been produced on the unglaciated landscape which has been modified by a mantle of loess and glacial outwash in the larger valleys of the area. Maximum relief in the region is about 1,000 feet.

Bedrock in the site region consists of Pre-Cambrian crystalline rocks exposed at the crest of the Wisconsin Dome by early Paleozoic (Cambrian and Ordovician, 572 Million Years Before Present [MYBP]) sedimentary strata. Basement rocks in the site vicinity are of granitic composition. The Paleozoic rocks are 1,200-1,300 feet thick in the site vicinity and consist of dolomites, sandstones and shales. About 600 feet of this sequence is exposed along the bluffs on both sides of the Mississippi river in the plant vicinity. Prior to the Pleistocene Epoch (more than 2 MYBP) the

river had carved a gorge as much as 150 to 210 feet deeper than can be seen today. It was buried by post-glacial sediment.

The site is located within the Central Stable Region tectonic province. The Central Stable Region consists of a vast area of large circular uplifts and sedimentary basins, and broad synclines and arches. Major structural features include the Wisconsin Dome and Arch, Lake Superior syncline, Forest City basin, Michigan Basin, and Illinois Basin. These structures were formed during the Late Pre-Cambrian and Early Paleozoic (more than 435 MYBP).

Major uplift and down-warping also occurred during late Paleozoic (330 MYBP to 240 MYBP). Some minor tilting occurred during and following the Pleistocene glaciations (2 MYBP to 0.001 MYBP). The site is located on the southwest flank of the Wisconsin Dome and the western flank of the Wisconsin Arch, a southward projection of the Wisconsin Dome. For this reason, sedimentary strata in the vicinity dip less than 20 feet per mile to the southwest.

Many faults have been mapped in the site region. None of these faults are considered to be capable according to the criteria in 10 CFR 100, Appendix A. Per the US NRC, "There are no geologic conditions in the site vicinity that represent hazard to the facility. Numerous faults are mapped in the site region, but investigations of all of these faults during the course of validating several nuclear power plant sites in the region, in addition to studies for the LACBWR, have not found any evidence of capable faulting. Additionally, the area is one of relatively low seismicity. Therefore, capable faulting does not need to be considered in the analysis of this site" (8).

Seismic activity (magnitudes ranging from 3.5 to 5.4) that has been noted between 1975 and 2008 occurred over 180 miles from the site and did not impact plant operations or decommissioning (9).

1.3.5. Surface Water Hydrology

The LACBWR site is in the Mississippi River valley and is relatively flat (see Figure 1-4). In the vicinity of the site, the valley is deeply cut into highly dissected uplands. From La Crosse to Prairie du Chien, approximately 40 miles south, the valley varies between 2.5 and 4.5 miles in width. The valley walls rise sharply 500 to 600 feet from river level.

There is little or no agricultural use of the river valley floor which consists primarily of marshy land, islands between river channels and extensions of low lying flood plain cut by ponds, sloughs and meandering river channels. Numerous short, steep-sided valleys have been cut into the upland where tributary streams intercept the main river valley. Both walls of the main channel are wooded. The flat upland areas and some of the tributary valleys are cultivated.

The main channel of the river varies greatly in width above and below the site. A series of dams are operated by the USACE for navigational purposes. Above Dam No. 8 (about 0.75 mile north of the site) the river is nearly four miles wide. Below the site, the river is relatively narrow for a distance of 20 miles, then gradually widens as the river approaches Dam No. 9, 33 miles south of the site.

Part of the licensed area (27 acres) is on a filled in area south of the original Genoa-1 steam plant. Therefore, drainage at the site has been established. One valley drains to the north and one to the south, so that only precipitation that falls on the bluff adjacent to the site and on a small portion of the upland area contributes to runoff directly across the site. This runoff is presently channeled

along the highway and railroad to prevent interference with traffic. No problems of flash floods have occurred at the site.

For a distance of 40 miles downstream of the site, virtually all municipal water supplies for cities and towns along the river are obtained from ground water. On the basis of readily available published records, the nearest major city using river water for direct human consumption is Davenport, Iowa, about 195 miles downstream. The nearest use of river water for industrial purposes, excluding the adjacent fossil plant, is the steam-power plant in Lansing, Iowa, about 15 miles downstream. River water at the Lansing plant is used for condenser cooling. There are no other known users of river water for industrial purposes between LACBWR site and Prairie du Chien, 40 miles downriver.

1.3.6. Ground Water Hydrology

Groundwater beneath the site is first encountered at depths ranging from approximately 15 to 25 feet Below Ground Surface (BGS) and the water table aquifer is in strong hydraulic communication with the adjacent Mississippi River. Groundwater in the shallow deposits and fill material likely flows towards the west and discharges into the Mississippi River. The deeper groundwater is also likely to flow towards the west but then may turn and flow parallel to the river. Based on a review of the groundwater elevation measurements collected during routine sampling in support of the Genoa 3 fossil station, it appears that there is a slight downward vertical gradient. However, there are some periods where the gradients are reversed and this is likely due to high river stages and flooding.

As the site has valley sand overlaying a layer of Eau Claire sandstone of the Cambrian Age which is underlain by Mount Simon sandstone, wells have been driven in areas closest to the site but not in valleys characterized by sub-layers of Mount Simon sandstone. Deep wells penetrating the Mount Simon layer flow to the surface indicating an artesian head about the level of the river valley floor. Use of water from these artesian aquifers has been limited because the water quality of the deep aquifers is poorer than that from shallow aquifers. As a result, there has been no extensive withdrawal of water and no significant decrease in the artesian head.

There are onsite potable and groundwater monitoring wells which are periodically sampled and analyzed. Regionally, there are five domestic wells south of the LACBWR site and east of Highway 35 with the water table encountered from 20 to 45 feet BGS.

1.3.7. Environs and Natural Resources

The LACBWR site is 17 miles south of the City of La Crosse and a mile south of the Village of Genoa (population about 260). The nearest community (three miles to the northwest) on the west shore is Reno, Minnesota, an unincorporated hamlet of about 350 people. The nearest community in Iowa is New Albin (pop. 513), located five miles southwest of the plant. Victory, Wisconsin, an unincorporated hamlet, is situated five miles south of the plant on the east shore. (Population data is from 2013 City-Data.com) (9).

The area within a five-mile radius is predominantly in Vernon County, Wisconsin, but also includes Houston County, Minnesota, and a small portion of Allamakee County, Iowa. Agriculture and forestry are the predominant land uses in Vernon County as well as in the neighboring counties on the west side of the Mississippi River. Nearly 90% of the Vernon County's gross area is

agriculture and woodlands. About 3.4%, consisting mainly of water area and marshlands is classified as undeveloped. Total developed land accounts for less than 6.6% of the county's gross area (10).

The primary agricultural activity is dairy farming, meat animals, and crop farming. In recent years, there has been a marked trend toward the conversion of Vernon County's marginal agricultural land to woodland. About two-fifths of the total land in farms is now devoted to woodland. The forests yield substantial amounts of oak and lesser quantities of maple and other hardwoods.

A modest amount of sandstone and limestone quarrying also takes place at a number of sites throughout Vernon County. Further, 85% of the developed land in Vernon County is in the low-intensity-use categories of residential and park land. The more intensive land uses (industry, commerce, public, transportation, and utilities) account for less than 15% of total developed land and less than 0.3% of gross area. Local industry consists almost exclusively of operations related to the processing of agricultural and forest products. One notable exception is the nonagricultural industries of the industrial park in Viroqua, Wisconsin located 25 miles to the east of LACBWR.

Land in the vicinity of the LACBWR site is overwhelmingly rural and undeveloped. Of the area within a five-mile radius, approximately one third is accounted for by water area and bottomlands included in the Upper Mississippi River Wildlife and Fish Refuge. The developed portion of the Village of Genoa, the only substantial community in the five mile radius of the site, occupies less than 100 acres. The nearest residences to the LACBWR site are within a mile to the east and northeast consisting of small trailer parks and residences on small acreages.

Refuge bottomland and water surface, lying mainly in Minnesota, extend west of the reactor site for 2.5 miles. Roughly a third of the area remains under cultivation. A few dozen residences, including vacation homes and boathouses, are scattered along the shoreline near State Highway 26 and houseboats are moored at several points at times during the year.

Approximately 3.5 square miles of Iowa are within the LACBWR five-mile radius. Most of it is water area and refuge bottomland, although there is some agricultural use on the bottomland. The five-mile radius includes a portion of the incorporated town of New Albin, whose total population is 522.

1.4. Operational Background

Key station milestones are presented in Chapter 2 of this LTP. The major milestones are:

- Allis-Chalmers, under contract with the AEC, designed, fabricated, constructed and performed startup of the LACBWR from 1962 to 1967,
- Dairyland entered into a contact to purchase steam from the nuclear plant to operate a turbine-generator for production of electricity: June 1962,
- Allis-Chalmers docketed application for construction: November 5, 1962,
- Initial Criticality achieved: July 11, 1967,
- Low power testing completed: September 1967,
- Provisional Operating authorization issued (DPRA-6): October 31, 1969,

- Provisional Operating License, DPRA-45 issued: August 28, 1973,
- LACBWR permanently shut down: April 30, 1987,
- Final reactor defueling was completed on June 11, 1987, and
- Completion of fuel loading into the ISFSI was completed on September 19, 2012.

The reactor was critical for a total of 103,287.5 hours. The 50 MWe generator was on line for 96,274.6 hours. The total gross electrical energy generated was 4.047 Gigawatt-Hours (GWH). The unit availability factor was 62.9%.

Prior to the completion of decommissioning, the LACBWR unit consisted of major buildings and structures such as the Reactor Building, Turbine Building, 1B Diesel Generator Building, Waste Treatment Building, Underground Gas Storage Tank Vault, Ventilation Stack, Low Specific Activity (LSA) building and others (see Figure 1-3). Intermittent systems dismantlement and metallic radioactive equipment has been removed since 2007, including the Reactor Pressure Vessel. The ISFSI, located south of the Genoa 3 fossil station, became operational in 2012 and holds five above-ground Dry Storage Casks with 333 spent fuel assemblies.

1.5. Plan Summary

1.5.1. General Information

The LTP describes the process used to meet the requirements for terminating the 10 CFR Part 50 license and to release the site for unrestricted use. The LTP has been prepared in accordance with the requirements in 10 CFR 50.82(a)(9) and is submitted as a supplement to the Defueled Safety Analysis Report (DSAR). The LTP submittal is accompanied by a proposed license amendment that establishes the criteria for when changes to the LTP require prior NRC approval. The subsections below provide a brief summary of the other seven chapters of the LTP.

1.5.2. Site Characterization

LTP Chapter 2 discusses the site characterization that has been conducted to determine the nature and extent of radioactive contamination on site prior to remediation, including structures that will remain at the time of license termination, soils, and ground water. Based on the results of the site characterization, Solutions will plan remediation and Final Status Surveys (FSS) in areas determined to be impacted by the operation of LACBWR.

The *LACBWR Radiological Characterization Survey Report for October and November 2014 Field Work* (11) and *LACBWR Radiological Characterization Survey Report for June thru August 2015 Field Work* (12) provided the foundation for further site characterization and the basis for dividing the site into survey units. The survey units were evaluated against the criteria specified in NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) (13) for classification. Data from subsequent characterization may be used to change the original classification of an area, within the requirements of this LTP, up to the time of FSS, as long as the classification reflects the level of residual activity existing prior to any remediation in the area.

1.5.3. Identification of Remaining Site Dismantlement Activities

LTP Chapter 3 identifies the remaining site dismantlement and decontamination activities. The information provided in Chapter 3 includes:

- A description of the areas and equipment that underwent remediation,
- A summary of radiological conditions that may have been encountered,
- Estimates of associated occupational radiation dose,
- An estimate of the types and quantities of radioactive material generated for release and disposal, and
- Descriptions of proposed control mechanisms that were used to ensure areas were not re-contaminated.

Solutions has decommissioned LACBWR in accordance with the DECON alternative described in NUREG-0586, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1, Volume 1*, (14). The decommissioning activities were conducted in accordance with the Solutions Safety and Health Program, Radiation Protection Program, Radioactive Waste Program, Off-Site Dose Calculation Manual (ODCM), and plant administrative, work control and decommissioning implementation procedures.

Activities conducted during decommissioning did not pose any greater radiological or safety risk than those conducted during plant operations. The radiological risk associated with decommissioning activities is bounded by previously analyzed radiological risk for former operating activities that occurred during major maintenance and outage activities.

The information provided in Chapter 3 supports the assessment of impacts considered in other sections of the LTP and provides sufficient detail to identify resources that were needed during dismantlement activities.

1.5.4. Remediation Plans

LTP Chapter 4 discusses the various remediation techniques that may be used during decommissioning to reduce residual contamination to levels that comply with the release criteria in 10 CFR 20.1402. This chapter also discusses the ALARA evaluation and the impact of remediation activities on the Radiation Protection Program.

The selected remediation methods used are dependent upon the contaminated material and extent of contamination. The principal materials that may be subject to remediation were structural surfaces. Very limited soil or buried pipe contamination was expected, and any noted groundwater samples have generally been at background levels or a small fraction of the drinking water standards. No surface water contamination has been identified, other than a temporary spike in tritium that occurred late 2017, due to the containment exhaust directed at surface water. Tritium levels continue to trend downward, once this condition was corrected.

Note that there is no embedded piping at LACBWR. Remediation techniques that may be used for structural surfaces include scabbling and shaving, chipping, sponge and abrasive blasting, standard and pressure washing, wiping, grit blasting, mechanical fracturing and cutting, and other methods. Surface and subsurface soil with activity levels in excess of the appropriate Derived Concentration

Guideline Level (DCGL) were removed and disposed as radioactive waste. Soil remediation equipment included, but was not limited to, back and track hoe excavators. Remediation of soils included the use of established excavation safety and environmental control procedures, as well as appropriate work package instructions to ensure adequate erosion, sediment, and air emission controls during soil remediation.

1.5.5. Final Status Survey Plan

LTP Chapter 5 presents the FSS Plan which was used to develop the site procedures, survey packages, and instructions to perform the FSS of the LACBWR site. The FSS Plan is comprised of an FSS for open land areas, above grade buildings, building basements and buried piping that will remain at the time of license termination. The FSS Plan describes the final survey process used to demonstrate that the LACBWR facility and site comply with radiological criteria for unrestricted use specified in 10 CFR 20.1402 (e.g. annual dose limit of 25 mrem to AMCG plus ALARA).

The FSS Plan describes the development of the survey plan, survey design and Data Quality Objectives (DQO), survey methods and instrumentation, data collection and processing, and data assessment and compliance. The FSS Plan addresses only LACBWR structures and land areas that are identified as impacted. The adjacent areas that are classified as non-impacted and the ISFSI, which will still remain a licensed area, were not subject to FSS.

1.5.6. Compliance with the Radiological Criteria for License Termination

LTP Chapter 6 presents the radiological information and methods used to demonstrate compliance with the radiological criteria for license termination and release of the site for unrestricted use. Chapter 6 discusses the site-specific inventory of radionuclides, future land use scenarios, exposure pathways, computational models used for dose modeling, sensitivity analysis, DCGLs and Dose Factors, the derivation of area factors, the basis for the selected exposure compliance scenario and evaluation of alternative exposure scenarios.

LTP Chapter 6 uses radiological information from Chapter 2 and establishes the allowable contamination and radioactivity concentration levels that Chapter 4 remediation methods will work towards and be verified by the FSS discussed in Chapter 5. Solutions applied the Argonne National Laboratory RESidual RADioactive materials (RESRAD) v7.0 dose modeling code to determine the radiological release criteria for remaining structures and soils to enable license termination.

1.5.7. Update of the Site-Specific Decommissioning Costs

LTP Chapter 7 provides an updated estimate of the remaining decommissioning costs for releasing the site for unrestricted use. This chapter also compares the estimated remaining cost with the funds currently available in the decommissioning trust fund.

1.5.8. Supplement to the Environmental Report

LTP Chapter 8 updates the Environmental Report for LACBWR with new information and any significant environmental impacts associated with the site's decommissioning and license termination activities. This section of the LTP is prepared pursuant to 10 CFR 51.53(d) and 10 CFR 50.82(a)(9)(ii)(G). In accordance with 10 CFR 51.53(d), Solutions considers Chapter 8 to be

a supplement to the Environmental Report addressing the actual or potential environmental impacts associated with the execution of the described decommissioning activities.

LTP Chapter 8 compares the described decommissioning attributes to those identified in NUREG-0586, which provides a generic environmental assessment for the decommissioning of a reference nuclear facility. The environmental assessment performed by Solutions determined that the environmental effects for decommissioning LACBWR are minimal and there are no adverse effects outside the bounds of NUREG-0586. Review of post-operating license stage environmental impacts was documented in a supplement to the Environmental Report for LACBWR dated December 1987. LACBWR decommissioning and dismantlement activities have resulted in no significant environmental impact not previously evaluated in the NRC's Environmental Assessment in support of the August 7, 1991, Decommissioning Order or NUREG-0191 related to operation of LACBWR, dated April 21, 1980.

1.6. Regulatory Notifications of Changes

Solutions is submitting the LTP as a supplement to the DSAR. Because the licensing history of LACBWR spans a period that includes several decommissioning regulation changes, the DSAR documentation is unique in that the required safety analyses are included in the *LACBWR Decommissioning Plan and Post-Shutdown Decommissioning Activities Report (D-Plan/PSDAR) Revision March 2014 (15)* which serves as the DSAR for LACBWR. Solutions will update the LTP in accordance with 10 CFR 50.71(e). Once approved, Solutions may make changes to the LTP, without prior NRC approval, in accordance with the criteria in 10 CFR 50.59, 10 CFR 50.82(a)(6), and 10 CFR 50.82(a)(7).

Solutions is also submitting a proposed amendment to the LACBWR license that adds a license condition that establishes the criteria for determining when changes to the LTP require prior NRC approval. Changes to the LTP require prior NRC approval when the change:

- Requires Commission approval pursuant to 10 CFR 50.59,
- Results in significant environmental impacts not previously reviewed,
- Detracts or negates the reasonable assurance that adequate funds will be available for decommissioning,
- Decreases a survey unit area classification (i.e., impacted to not impacted, Class 1 to Class 2; Class 2 to Class 3; or Class 1 to Class 3 without providing NRC a minimum 14 day notification prior to implementing the change in classification,
- Increases the derived concentration guideline levels (DCGL) and related minimum detectable concentrations (for both scan and fixed measurement methods).
- Increases the radioactivity level, relative to the applicable DCGL at which an investigation occurs,
- Change the statistical test applied other than the Sign test.
- Increase the probability of making a Type I decision error above the level stated in the LTP.

- Change the approach used to demonstrate compliance with the dose criteria (e.g., change from demonstrating compliance using DCGLs to demonstrating compliance using a dose assessment that is based on final concentration data).
- Change parameter values or pathway dose conversion used to calculate the dose, such that the resultant dose is lower than in the approved LTP and if a dose assessment is being used to demonstrate compliance with the dose criteria.

The contact for LTP information, including any submitted changes and updates, is:

Gerard P. van Noordennen
Senior Vice President, Regulatory Affairs
LaCrosseSolutions, LLC
S4601 State Road 35
Genoa, WI. 54632-8846
(224) 789-4025
gpvannoordennen@energysolutions.com

1.7. **References**

1. Letter from Dairyland Power Cooperative to the Nuclear Regulatory Commission, Application for Order Approving License Transfer and Conforming Administrative License Amendments, dated October 8, 2015.
2. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.179, Standard Format and Content of License Termination Plans for Nuclear Power Reactors, Revision 1 - June 2011.
3. U.S. Nuclear Regulatory Commission NUREG-1700, Revision 1, Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans – April 2003.
4. U.S. Nuclear Regulatory Commission NUREG-0191, Final Environmental Statement related to Operation of the La Crosse Boiling Water Reactor by Dairyland Power Cooperative - April 1980.
5. Letter from Dairyland Power Company to the Nuclear Regulatory Commission, Subject: Planning for ISFSI, LAC-14029, March 10, 2008.
6. www.wunderground.com.
7. [www.mvp.wc.usace.army.mil/projects/Lock 8](http://www.mvp.wc.usace.army.mil/projects/Lock%208).
8. Dairyland Power Cooperative, LaCrosse Boiling Water Reactor (LACBWR) Decommissioning Plan, revised November 2003.
9. <http://www.city-data.com/city/Genoa-Wisconsin.html>.
10. 2008 Vernon County Tax Assessment Rolls.

-
11. EnergySolutions GG-EO-313196-RS-RP-001, LACBWR Radiological Characterization Survey Report for October and November 2014 Field Work – November 2015.
 12. EnergySolutions LC-RS-PN-164017-001, LACBWR Radiological Characterization Survey Report for June thru August 2015 Field Work – November 2015.
 13. U.S. Nuclear Regulatory Commission, NUREG-1575, Revision 1, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), August 2000.
 14. U.S. Nuclear Regulatory Commission NUREG-0586, Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1, Volume 1 – November 2002.
 15. Dairyland Power Cooperative, LACBWR Decommissioning Plan and Post-Shutdown Decommissioning Activities Report (D-Plan/PSDAR), Revision - March 2014.

Figure 1-1 Site Regional Location



Figure 1-2 Site Overview

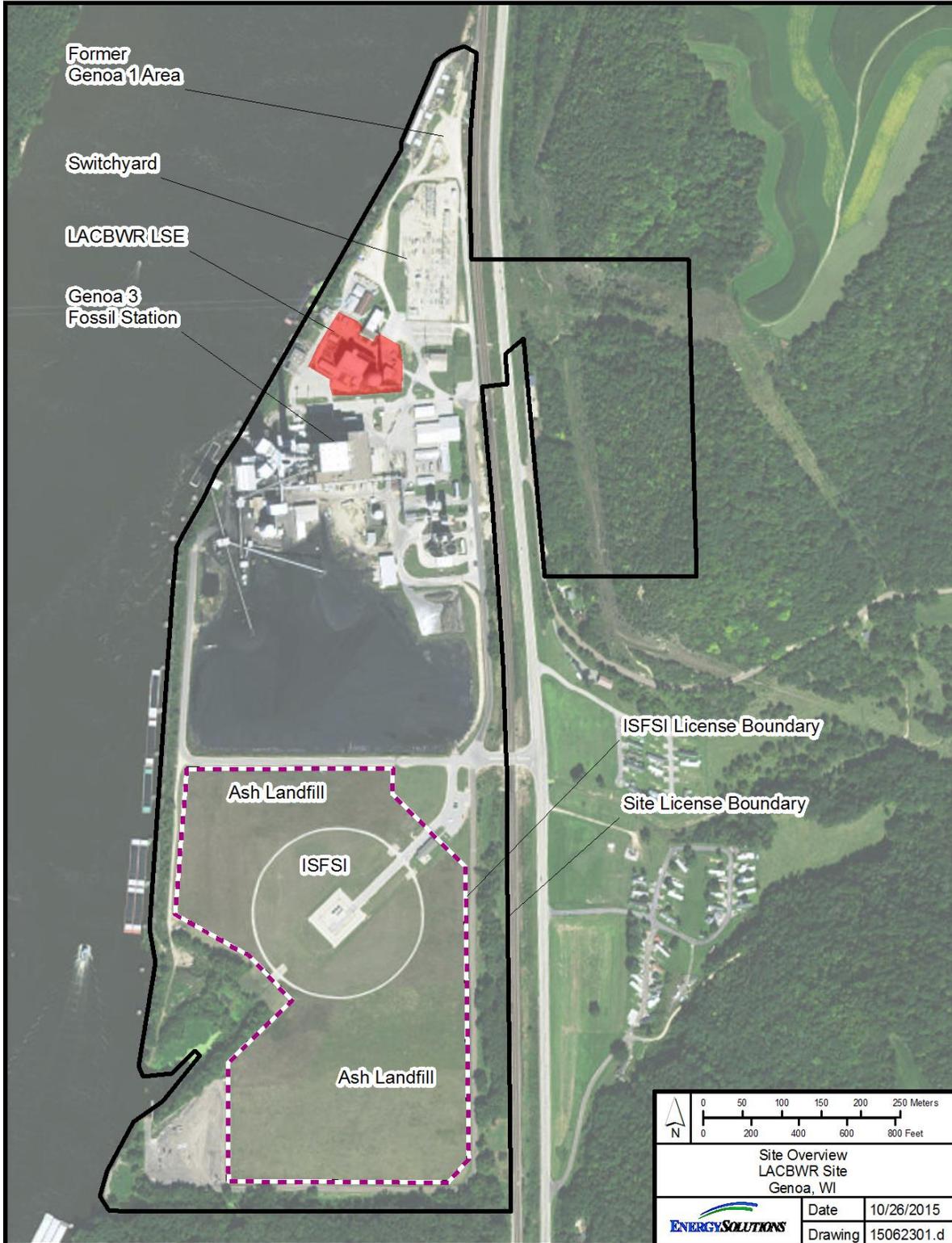


Figure 1-3 LACBWR Buildings

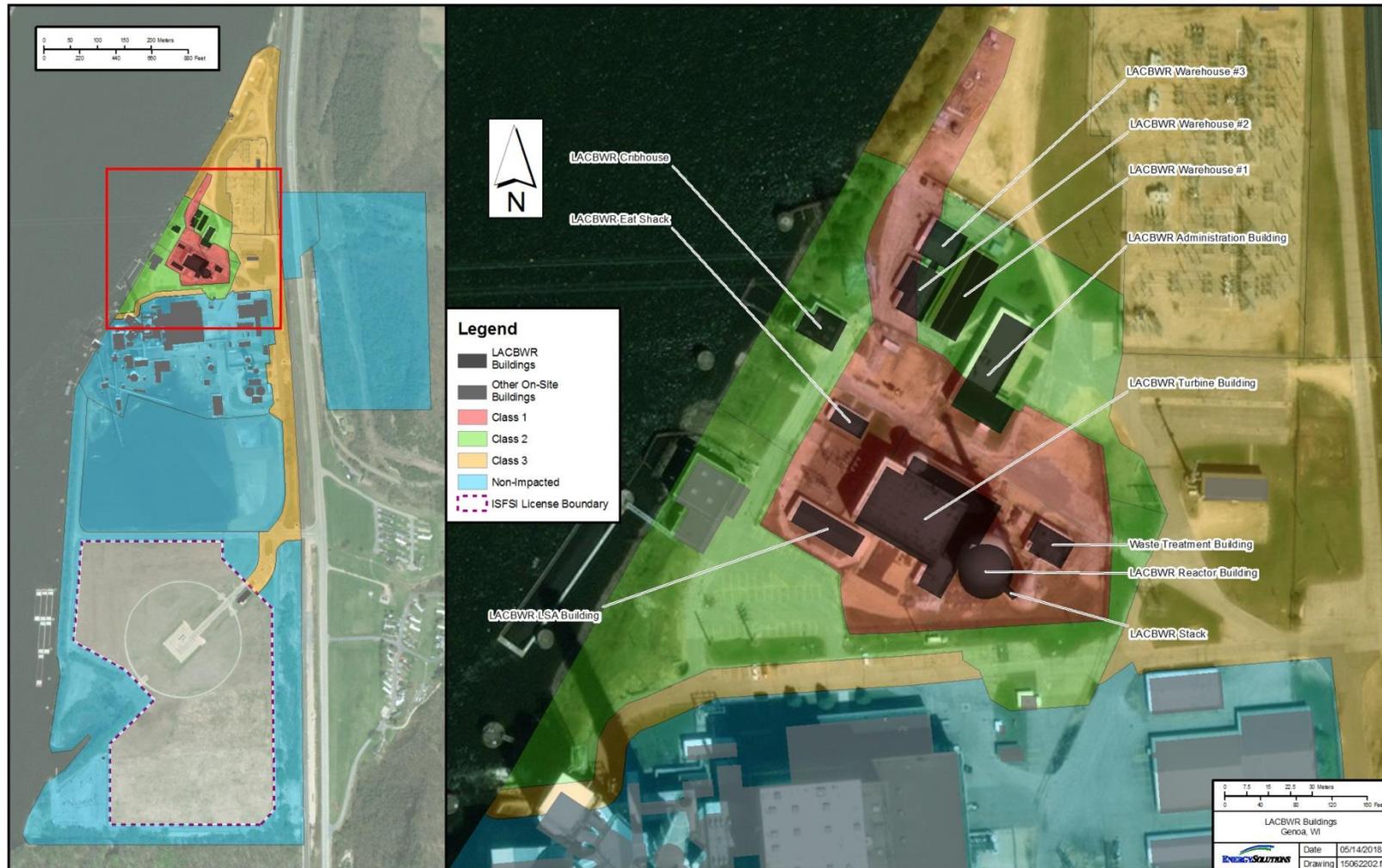


Figure 1-4 Topographical Map

