

Forest Products Laboratory – Demolition of Buildings 2, 3, 8, 19 & 49, replacement of Building 5 and  
Construction of a new Bio-energy Pilot Plant Project EA  
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# Environmental Assessment

## Demolition of Existing Buildings and Construction of a New Storage Facility and Bio-energy Pilot Plant

Forest Products Laboratory



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## Background

The Forest Products Laboratory (FPL) in Madison, Wisconsin, is the Nation's leading Federal wood-utilization research laboratory and wood research institute. FPL is located to the west of the University of Wisconsin (see Figure 1, page 16). The FPL campus encompasses 18 buildings; the main building is seven stories high and over 209,000 square feet (see Figure 2, page 17).

With approximately 250 scientists and support staff, the FPL conducts research on expanded and diverse aspects of wood use. Research concentrates on pulp and paper products, housing and structural uses of wood, wood preservation, wood and fungi identification, and finishing and restoration of wood products. In addition to traditional lines of research, FPL is responding to environmental pressures on forest resources by using cutting-edge techniques to study recycling, develop environmentally friendly technology, understand ecosystem-based forest management, and pursue research opportunities to improve the economics of producing transportation fuel and chemicals from biomass.

In November 2003, the FPL contracted with Greenhorne and O'Mara, Inc. (G&O), to assess the condition of the FPL buildings within its Madison campus, including buildings 2, 3, 5, 8, and 19. The assessment addressed building systems and components, space layout, and functionality. G&O found these buildings in poor condition and in need of significant repair—and some were found unsafe. Recommendations from this assessment include demolition of buildings 2, 3, 5, 8, and 19. See Appendix A for a summary of building assessments and recommendations.

## Purpose and Need for Action

The reason for demolishing buildings 2, 3, 5, 8, and 19, is due to the poor condition of these buildings. Operations currently conducted in buildings 2, 3, 8 and 19 will soon be moved to new facilities under construction—these buildings would then be considered excess. Additionally, because FPL is well placed to pursue research opportunities in bio-energy production, construction of a bio-energy pilot plant would provide valuable research findings at a pilot scale and determine viability for further scale-up to commercial, production-scale processes. Building 49, currently a storage shed, is located where the pilot plant would be constructed and would need to be removed.

## Proposed Action

**Building Demolition.** The FPL proposes to demolish buildings 2, 3, 8, and 19 (approximately 29,625 square feet), including the below-grade foundations. All building foundations would be removed and sites would be graded for appropriate drainage and landscaping, and parking lots would be restored as appropriate. Building 5 would be demolished (3,734 square feet); and existing steam header and associated pipe and connections serving the FPL and the Veteran's Administration Hospital would be relocated. A new storage facility (approximately 10,000 square feet) would be constructed on or near the existing site of building 5 for storage of wood materials displaced from building 49 and facility maintenance equipment. The new storage building will likely be a single-story, high-bay PEB or a pre-cast concrete structure, sprinkled for high storage, with limited office space (1), restrooms, and minor administrative space on a second level. Existing roadway circulation around building 5 would be modified to accommodate the new, larger structure built in its place. One FPL staff person would occupy this new building. Access to the facility includes maintenance vehicles and forklift access to insert or remove materials at a rate of once per week to several times per day. Building 49 (built in 2004) is a 6,400 square foot un-insulated, pre-engineered metal building (PEB) with concrete foundations and floor slab. This PEB serves as a storage facility for FPL wood material and

equipment and would be disassembled and disposed of to make way for construction of the bio-energy pilot plant.

The building demolition would include disposing of asbestos and lead paint according to State of Wisconsin Department of Natural Resources Asbestos Program requirements (Chapter NR 447 Wisconsin Administrative Code). Demolition would also include capping, securing, and demolition of site utilities; razing the structures; and recycling and/or reusing construction waste. Relocation of the steam header would include trenching for new steam lines (direct buried or box conduit) to existing steam tunnels. Trenching associated with relocation of these new steam lines is expected to be approximately 600 to 800 feet and would be in existing parking lots, along building foundations or along existing sidewalks. These areas would be rehabilitated after lines are relocated. Removal and recycling of materials associated with building demolition, including mercury switches, fluorescent tubes, concrete, and shingles, would comply with all State and local requirements. Permitting required for these activities would occur prior to implementation.

**Bio-Energy Pilot Plant.** The new bio-energy pilot plant would be constructed on the site currently occupied by building 49 (Figure 3, page 18). The proposed facility would provide a research facility including analytical laboratories; high-bay pilot plant space; and occupant support spaces for development, scale-up, and evaluation of technologies for commercially viable conversion of biomass to fuels, alternative energy sources, and related chemicals and products. FPL experts in cellulose chemistry, microbial fermentation, biochemistry, and engineering would work together with Federal, university, and industry partners to develop and scale-up economical bio-conversion and thermo-conversion technologies for woody biomass into bio fuels.

The facility is expected to employ 6 to 10 new employees. Parking for new employees and visitors/cooperators would be provided by existing FPL parking spaces and a new parking area adjacent to the newly proposed facility (approximately 10 to 15 additional spaces). Anticipated visitor or cooperator use of the new facility is 3 to 5 persons at any given time.

The proposed facility would focus on microbial and biochemical technology, thermo-chemical-conversion sciences, and bio-chemical conversion sciences for the production of fuel and chemicals from biomass (see: <http://www.fpl.fs.fed.us/>). Estimates of raw material, fuel products produced, waste products generated, water use and air emissions listed below are based on highest expected use required for cooperators to 'prove' a process to qualify to move to the next step of building a production facility. These estimates represent worst case scenarios expected (24 hours/day, 7 days per week/8 weeks continuous) for each process. FPL anticipates utilization of 30 to 50 percent, meaning that the facility would be operated 30 to 50 percent of the time; thus all estimates reported below are very conservative.

- *Raw Material:* The facility will process 1 ton/day of wood, municipal solid waste (possibly), switchgrass, corn stover, wheat stover, rice straw, or other agricultural products. One ton of wood is approximately 1 chord (4 feet x 4 feet x 8 feet). One ton of agricultural products (delivered in large bales) is about 2.5 large round bales. A flatbed limited to 20 tons could carry as much as 20-days supply of wood in one delivery. Therefore, deliveries would be at a rate of about two trucks per month when operating at maximum capacity. With agricultural products, the deliveries might be more frequent: perhaps one truck per week when operating at maximum capacity, due to the larger volume to weight ratio of this material. As much as one month supply of material might be kept on site at any given time, but it is likely the storage capacity will be less since the material must be kept dry (under cover). It is more likely FPL would only keep 1- or 2-weeks-worth of material on hand at any given time, which is equivalent to 14 chords (2 weeks) of wood or 18 bales of agricultural material (1

week). This material would be kept on site and stored only long enough to use it, so any given amount would only be kept for a week or two, but would be replenished during an 8 week study.

- *Fuel Produced:* The top efficiencies currently obtainable for wood to fuel are in the range of 80 to 90 gallons/ton of wood. However, within the processes to be tested, all of the products will not be converted to fuels, and processes with lower yields will be used. For biochemical conversion FPL would use a slipstream and convert only a small amount to fuel (about 15 percent), resulting in about 20 gallons of ethanol/day; for thermo-conversion we will be making transportation fuels (gasoline, diesel, or jet fuel), or could make methanol or ethanol in amounts of 40 gallons/day. In these quantities, no more than about 1,500 gallons would be on site at any given time, and likely much less. At 40 gallons/day, and producing for 8 continuous weeks, required storage capacity would be 1,280 gallons (assuming there would be no disposal of the product until the 8-week test is complete).
- *Waste Products:* For biochemical conversion—500 pounds lignin and residuals (to landfill) and 110 gallons fermentation waste (yeast solids + water, to sanitary sewer); for thermo-conversion (gasification)—200 pounds ash and tars/day and 1.8 tons of CO<sub>2</sub>/day and trace amounts of ammonia. These two processes, biochemical and thermal conversion, are mutually exclusive (it is one or the other, and the numbers are maximums based on 24/7 operation).

Final architectural plans for this building have not yet been completed; however, the facility is envisioned to be a two-story building of approximately 50,000 gross square feet, designed to aesthetically fit in with the existing structures surrounding the area, taking its primary architectural themes from existing FPL structures. The project design for the pilot plant would comply with all code requirements for Federal facilities, including compliance with Occupational Safety and Health Regulations Standards 29 Part 1910, and City of Madison city zoning regulations. In addition, the facility would be certified under the U.S. Green Building Council Leadership in Energy and Environmental Design program (LEED) (Gold Level), including provisions for Laboratories for the 21st Century (LABS 21), and Energy Star for Buildings and Plants. The facility would also adhere to the Energy Policy Act of 2005 and Energy Independence and Security Act of 2007, and would follow the USDA Sustainable Building Implementation Plan. Numerous design factors are required to be certified under LEED (Gold Level), using LABS 21 provisions, and Energy Star; these can be found at the following websites: <http://www.usgbc.org>; <http://www.labs21century.gov>; and <http://www.energystar.gov>. In relation to environmental compliance and certification as LEED with LABS 21 provisions, this project is required to comply with all applicable Federal, State, and local environmental laws including construction activity pollution prevention.

Due to placement of other buildings and roads, short-term construction activities of this building are not expected to impact a footprint area of more than 2 acres (see Figures 2 and 3, pages 17 and 18). A landscaping plan that compliments existing landscaping in the area will be developed for the new bio-energy pilot plant since the existing site is not landscaped.

The cost of the proposed bio-energy pilot plant is approximately \$39.1 million with design beginning in winter of 2009–2010, construction beginning in spring 2011, and completion scheduled by summer 2012. Building demolitions will likely begin in late spring or summer of 2010 and continue through December.

## Decision Framework

The decision to be made is whether or not to implement the proposed action.

## Public Involvement

In January 2009, the FPL mailed a public scoping letter to the people, governmental organizations, and others listed in the “Consultation and Coordination” section of this EA. Information concerning the proposed demolition was posted on the FPL internet site and published in the *Wisconsin State Journal* and *Capital Times* on January 16, 2009.

## Issues

An issue is a point of disagreement, debate, or dispute with a proposed action based on some anticipated effect. Forest Service personnel receive public comments and categorize them into significant or non-significant issues. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, “...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review.” (Sec. 1506.3).

Significant issues are those with a clear direct or indirect causal relationship from implementing the proposed action. Non-significant issues are identified as those (1) outside the scope of the proposed action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence.

### *Significant Issues*

No person, tribe, organization, or other agency identified any substantive issues regarding the effects of the proposed action during scoping. Therefore, no significant issues were identified for the Demolition of Existing Buildings and Construction of a New Storage Facility and Bio-energy Pilot Plant project.

## Alternatives Considered but Dropped from Additional Analysis

During the pre-project analysis, the FPL design team evaluated four site options to accommodate the proposed facility. Three sites were located on the Madison FPL campus and the fourth site was an off-campus location within 4 miles of FPL. Based on criteria used to evaluate feasibility of these options, none of these were considered adequate based on space availability, issues with design of existing structures, and cost. In addition, all General Services Administration (GSA) leased and owned properties in the Madison area were evaluated, but none were suitable in size or location for a pilot plant.

## Alternatives

The following describes the alternatives for the demolition of buildings 2, 3, 8, and 19; replacement of buildings 5 and 49; and construction of a new bio-energy pilot plant project including the proposed action and the no-action alternative.

### *Alternative 1 (No Action)*

Under the no-action alternative, operations currently conducted in buildings 2 and 8 would be relocated into the new Multi-use Laboratory (now under construction). Operations conducted within building 3 would be relocated into the forthcoming Fire Research Laboratory addition, and people in building 19 would likely move into building 1. Therefore, 3 or 4 buildings would be left empty (and

abandoned from their current use) until further direction is proposed. Buildings 5 and 49 would remain at current use status and the bio-energy pilot plant would not be constructed.

### *Alternative 2 (Proposed Action)*

See description under the previous “Proposed Action” section.

## Mitigations Specific to the Proposed Action

The FPL would engage the services of an architectural/engineering firm to “design” the demolition of buildings 2, 3, 5, 8, 19, and 49, and steam header relocation, including recycling of construction waste, restoration of the site to native turf (or other approved vegetation), erosion control according to State requirements for National Pollutant Discharge Elimination System (NPDES), and noise and air issues regulated by the State.

The FPL would engage the services of licensed firms to conduct comprehensive testing of all building materials and identify all asbestos-containing materials (ACM) and lead paint within the building. Findings would be used to develop abatement specifications and FPL would engage licensed abatement contractors to properly remove and dispose of all ACM and lead based paint, and to properly dispose or recycle other materials such as mercury switches, fluorescent tubes, and other materials identified within the demolition design. Licensed abatement contractors would be required to comply with all Federal, State, and local requirements.

The bio-energy pilot plant would be designed to meet or exceed all applicable Federal, State, and local codes, including permitting requirements for operations. In addition, the facility would be certified under the U.S. Green Building Council Leadership in Energy and Environmental Design program (Gold Level), including provisions for LABS 21, and Energy Star for Buildings and Plants. The facility would also adhere to the Energy Policy Act of 2005 and Energy Independence and Security Act of 2007, and would follow the USDA Sustainable Building Implementation Plan.

Emissions from pilot-scale research projects conducted in the bio-energy pilot plant will be monitored. FPL will work with Wisconsin Department of Natural Resources (WDNR) to ensure compliance with all State and Federal standards and permit requirements for air emissions.

Prior to the start of demolition or construction, FPL would comply with the requirements of the WDNR to obtain a Wisconsin Pollution Discharge Elimination System Construction Site Erosion Control and Storm Water Discharge Permit. The permit applies to any surface disturbance of 1 acre or more and requires the development and implementation of a storm water pollution prevention and erosion control plan (WDNR 2006). FPL would also obtain any necessary permits associated with air quality from the WDNR for demolition and/or construction activities.

During the initial phases of ground breaking activity for the proposed bio-energy pilot plant, archaeological monitoring (performed by a professional archeologist familiar with and registered in the State of Wisconsin) would be performed to confirm presence or absence of archeological resources. If archeological resources are found, construction activity would be stopped in that locality and the Office of Historic Preservation at the Wisconsin Historical Society would be consulted to implement emergency archeological data recovery prior to continuation of work.

If any archaeological materials are encountered during demolition of buildings 2, 3, 5, 8, 19, and 49; the replacement of building 5; and construction of a new bio-energy pilot plant project; work would be stopped and the Office of Historic Preservation at the Wisconsin Historical Society would be consulted prior to continuing work. If archeological monitoring were required by the Office of

Historic Preservation, the FPL would secure the services of a qualified and registered archaeologist familiar with the archaeological and cultural resources of the area.

## Comparison of Alternatives

This section summarizes the effects of implementing each alternative (see Table 1).

**Table 1. Summary comparison of effects for each alternative**

Resource Effects	No Action Alternative	Proposed Action Alternative
Soils and Water Resources	No change from current conditions.	Temporary disturbance to soils during demolition, steam header relocation and construction. Erosion and sediment controls and storm water management would minimize erosion and offsite sediment delivery to receiving waters. Design features and mitigation measures associated with building design and construction activities will limit impacts.
Air Quality	No change from current conditions.	Potential for temporary, localized impacts to air quality during demolition and construction from vehicle emissions. Mitigation measures during demolition would minimize blowing dust. Mitigation measures ensure proper removal and disposal of all ACM. Emissions from bio-energy pilot plant will be monitored and FPL will work with WDNR to ensure compliance.
Human Health and Safety; Noise	No change from current conditions.	Demolition and construction is not anticipated to generate any new hazardous waste. Building design features require a pollution prevention plan associated with construction activities in addition to obtaining a NPDES permit. Future research activities associated with the new bio-energy pilot plant would comply with all local, State, and Federal regulations regarding the use and handling of hazardous materials. Mitigation measures ensure proper removal and disposal of all ACM and lead based paint, in addition to proper disposal or recycling of other materials such as mercury switches, fluorescent tubes, and other materials identified within the demolition design. Noise during demolition would be temporary and would not result in significant impacts. Design of new bio-energy pilot requires compliance with all applicable Federal, State, and local environmental laws including City of Madison noise ordinances "Offenses against peace and quiet".
Heritage Resources	No change from current conditions.	Mitigation measures require archeological monitoring during the initial phases of ground breaking. If archeological resources are found during ground breaking stages of construction of the bio-energy pilot plant location or during demolition of any of the other proposed buildings, activity would be stopped and the Office of Historic Preservation at the Wisconsin Historical Society would be consulted to implement emergency archeological data recovery prior to continuation of work. Implementation of these mitigation measures would not result in significant impacts.
Biological Resources, including Federal and State Listed Species	No change from current conditions.	Because there is little or no habitat for wildlife and listed species, there would be no impacts to species or habitat.
Land Use and Aesthetics	No change from current conditions.	Land use aesthetics are expected to improve with the demolition of the derelict structure and re-vegetation of the site. New bio-energy pilot plant would be designed to aesthetically fit in with existing FPL buildings.
Socio-economics	No change from current conditions.	There would be no long-term impacts. Some short-term increases in construction jobs may be associated with construction and design activities of the bio-energy pilot plant and building demolitions.

Environmental Justice	No change from current conditions.	No minority or low-income populations would be disproportionately affected.
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## Environmental Consequences

The following environmental consequences tier to the FPL Modernization Environmental Analysis completed by the FPL in 2006 (USDA 2007). “Project area” within this document refers to the FPL campus area where the buildings proposed for demolition, relocation, and construction are located.

### *Affected Environment*

**Natural Environment.** The geology underlying the project area consists of Pleistocene glacial deposits and loess, and the topography is composed of gently sloping alluvial terraces (CCRL 2003; Wallace 2006). The estimated depth to groundwater is 26 feet (CCRL 2003). The soils in the project area are identified in the Dane County Soil Survey (USDA SCS 1972) as Kegonsa silt loam, 2 to 6 percent slopes; and McHenry silt loam, 6 to 12 percent slopes (USDA 2006).

According to Ecological Landscapes of Wisconsin (WDNR 2004b), the project area is characterized as Southeast Glacial Plains. Agricultural practices and urbanization have dramatically altered this landscape, resulting in the absence of historic vegetation communities in the region. The vegetation in the vicinity of the FPL project area lacks natural vegetation communities; vegetation consists of ornamental landscape, grass, shrubs, and numerous mature trees. Animals likely to occur near the project area include generalist species that are adapted to urbanized environments. These likely include, but are not limited to, the American robin (*Turdus migratorius*), mourning dove (*Zenaidura macroura*), house finch (*Carpodacus mexicanus*), eastern garter snake (*Thamnophis sirtalis*), American toad (*Bufo americanus*), and small rodents such as the eastern gray squirrel (*Sciurus carolinensis*) (USDA 2006).

There are no aquatic resources in the project area, including wetlands. All buildings proposed for demolition and/or relocation, and the new construction of the bio-energy pilot plant, are located within the Six Mile and Pheasant Branch Creeks Water Management Unit defined by WDNR. Surface water runoff from the FPL area flows to Lake Mendota less than 1 mile northeast of the project area. Lake Mendota is identified by WDNR as polluted with nutrients and sediment, primarily due to urban and agricultural runoff, which causes excessive algae blooms and excessive weed growth (WDNR 2001). In the most recent approved list of impaired waters (WDNR 2004a), Lake Mendota was listed by WDNR as impaired due to elevated levels of polychlorobiphenyls (USDA 2006).

The Clean Air Act of 1977 (CAA), as amended, requires the EPA to set national ambient air quality standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA set NAAQS for six principal pollutants, called “criteria” pollutants, with which the State of Wisconsin must comply, and retains primary responsibility for enforcement. As of March 2006, Dane County, where FPL is located, is in attainment with NAAQS (EPA 2006b; USDA 2006).

Current noise levels in the project area are comparable to those of other urban environments. Typical outdoor urban daytime noise levels are in the range from 58 to 72 decibels (dB) (EPA 1974). Local traffic is the main contributing factor to the local ambient noise level (USDA 2006).

The terms “hazardous materials” and “hazardous waste” refer to substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act (RCRA). Hazardous materials include substances that, because of their quantity, concentration, or

physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released into the environment. Hazardous wastes that are regulated under RCRA are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that either exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste under 40 CFR Part 261. Petroleum products include petroleum-based fuels, oils, and their wastes.

Issues associated with hazardous material and waste typically center around waste streams; underground and above-ground storage tanks; and the storage, transport, use, and disposal of pesticides, fuels, lubricants, and other industrial substances. When such materials are improperly used in any way, they can threaten the health and well being of wildlife species, habitats, and soil and water systems, as well as humans.

Due to the age of the buildings proposed for demolition, it is possible that asbestos-containing materials (ACM) and lead paint may be present. Additionally, mercury switches and fluorescent tubes are likely present. No below or above ground hazardous materials storage tanks are known to exist where the bio-energy pilot plant is proposed or associated with buildings proposed to be demolished.

**Threatened, Endangered and Sensitive Species.** Five species were found to occur in Dane County and were either threatened endangered, reintroduction populations, or experimental populations. None of these five species were found to occur near buildings 2, 3, 5, 8, 19, or 49 (WNHI 2009). As shown in Table 2, none of the threatened or endangered species that are known to occur in Dane County have been found near the project area. The proposed demolition of buildings 2, 3, 5, 8, 19; the relocation of building 49; and construction of a new bio-energy pilot plant would take place in an urban environment where none of the listed five species have suitable habitat. Lake Mendota is 0.3 miles away from the project area, and although whooping cranes are associated with open water, this species would not be close to urban buildings. Even during migration stopovers, whooping cranes rest in wetland or field areas, not buildings or sidewalks (Kitchen 2008). None of the mentioned species are likely to occur near the project area due to lack of suitable habitat.

**Table 2. Federally threatened and endangered species in Dane County, Wisconsin**

Species	Status	General Habitat Association	Likelihood of Occurring in the Project Area
Whooping crane ( <i>Grus americanus</i> )	Non-essential experimental population	Open wetlands and lakeshores	Not Likely: Lakeshores exist nearby (Lake Mendota); however, whooping crane occurrence is rare due to urban setting.
Higgins eye pearly mussel ( <i>Lampsilis higginsii</i> )	Endangered	Lower Wisconsin River	None: due to lack of preferred habitat.
Eastern prairie fringed orchid ( <i>Platanthera leucophaea</i> )	Threatened	Wet grasslands	None: due to lack of preferred habitat.
Mead's milkweed ( <i>Asclepias meadii</i> )	Reintroduction population	Tall grass prairie	None: due to lack of preferred habitat.
Prairie bush-clover ( <i>Lespedeza leptostachya</i> )	Threatened	Dry to mesic prairies with gravelly soil	None: due to lack of preferred habitat.

Source: USDI (2007).

**Social Environment.** The project area is located in the City of Madison, Dane County, Wisconsin, near the west end of the University of Wisconsin campus. In 2000, Madison had a population of

208,054 (U.S. Census Bureau 2002e). In 2003, the industries employing the most workers in Madison were education and health; trade, transportation, and utilities; and professional and business services (City of Madison 2005). The State of Wisconsin (including the University of Wisconsin), University Hospital and Clinics, and Wisconsin Physicians Service Insurance Corporation are the largest employers in Dane County (DCDPD 2005; USDA 2006).

Executive Order (EO) 12898, Environmental Justice and EO 13045, Protection of Children requires Federal proponents to assess how impacts of a proposed action may disproportionately affect minority and low-income persons or children under 18 years of age. Comparisons of populations for environmental justice issues and children under 18 also tie to the FPL Modernization Environmental Analysis completed by the FPL in 2006 (USDA 2007). In summary, according to the 2000 census, approximately 17.9 percent of the local population for Madison is under the age of 18. In Wisconsin, 25.5 percent of the population is under the age of 18; in Dane County, 22.6 percent; and in the U.S., 26 percent (U.S. Census Bureau 2002b, 2002c, 2002d, 2002e).

The total number of persons under the poverty level is significantly higher in Madison than in the county, State, or national levels. The percentage of minors living below the poverty level in Madison is substantially higher than in Dane County overall and slightly higher than the State level. The percentage of minors living in poverty in Madison is lower than the national average. Unemployment rates in Madison are comparable to county, State, and national levels.

FPL presently employs approximately 250 scientists and support staff. Additional staffing needs associated with the proposed bio-energy plant are anticipated to be approximately 6 to 16 persons. Additionally, some localized and temporary beneficial economic impacts might be experienced by construction workers hired for the project under the proposed action. Neither of these increases in employment associated with the proposed action is expected to impact minority and low-income populations. Construction of the new bio-energy pilot plant would not displace any schools, residential housing, or other commercial structures that could impact children under 18 years of age.

**Cultural Resources.** As part of the phase I investigation for the recent FPL Modernization Project, modern and historical documents were examined in the State Historical Society of Wisconsin Archives and Library. These records included 19<sup>th</sup> and 20<sup>th</sup> century plat maps, economic land use records, and descriptive histories for Dane County. Available documents do not record the presence of historic structures situated in the immediate location for the proposed Multi-use Laboratory (Hodgson 2006; USDA 2006). Due to numerous modifications and additions neither the FPL compound nor any of its structure are eligible or listed on the National Register of Historic Places (Banker 2008).

The FPL site was identified as being within the boundaries of a previously recorded archaeological site. This site has been recorded by the State of Wisconsin Historical Society as the University Ridge Mound Group (Smithsonian Number: 47-DA-0126), a prehistoric Native American effigy and linear mound group (Hodgson 2006; USDA 2006).

A review of the State Historical Society of Wisconsin's Archaeological Site Inventory database revealed that in addition to 47-DA-0126, 77 previously reported archaeological sites are currently recorded within 1 mile of the FPL. The diverse nature of these sites testifies to the high level of prehistoric and early historic period activities in the area that is now the city of Madison. Like 47-DA-0126, a number of prehistoric sites near the southern edge of Lake Mendota date to the Late Woodland period and suggest the area contained villages that were occupied during this time (Hodgson 2006; USDA 2006).

None of the structures included in the proposed action are located within the boundaries of recorded archaeological sites. However, although it was noted that the recently demolished FPL building 41 structure was located within the boundaries of the recorded University Ridge Mound Group site (47-DA-0126), examination of available historical documents, records, maps, and photographs, along with archaeological survey conducted in the area, indicated the following:

- 1) The mounds comprising the site were located over 150 meters to the west of the proposed FPL building 49 demolition site.
- 2) The archaeological site (47-DA-0126) is documented as being completely destroyed by 1932.
- 3) In regards to the previous action taken on building 41, no archaeological resources were recovered during archaeological field investigations in May of 2006. These included extensive shovel testing at the proposed Multi-Use Laboratory building 41 site locations.

In further evidence that these efforts were sufficient to determine the presence/absence of archaeological resources on site, the FPL received a letter from the Wisconsin Historical Society in March 13, 2008, stating they did not believe that the demolition of building 41 would result in any historic properties being affected pursuant to 36 CFR 800.4(d)(1). The possibility remains, however remote, that previously undiscovered archaeological resources associated with Site 47-DA-0126 may be present in the proposed location of the bio-energy pilot plant and demolition of building 49 locations.

## *Compliance Summary*

**Natural Environment.** Neither the proposed action alternative nor the no-action alternative would have a significant impact on the terrestrial flora and fauna. The demolition of existing buildings as described in the proposed action and construction of a new storage facility and bio-energy pilot plant building would take place within an area that is heavily urbanized. Demolition and construction would not pose a significant threat to existing terrestrial wildlife communities due to the localized area of effect, the broad range of use by the species present, and the minimal existing habitat to support terrestrial biological resources. Demolition and construction activities would implement best management practices (BMPs) that would minimize the potential for secondary, offsite impacts to nearby Lake Mendota. The LEED certification program requires the creation and implementation of an erosion and sedimentation control plan for all construction activities associated with the project. The plan describes the measures implemented during construction to accomplish the following objectives: prevent the loss of soil during construction by storm-water runoff and/or wind erosion including protecting topsoil, prevention of sedimentation of storm sewers or receiving streams, and prevention of pollution of the air and dust and particulate matter. Potential technologies and strategies used may include temporary and permanent seeding, mulching, silt fencing, sediment traps, and sediment basins.

All waste stream management, transport, and disposal of hazardous waste associated with the proposed action would meet requirements under CERCLA and SWDA, as amended by the Resource Conservation and Recovery Act (RCRA), as well as compliance with State of Wisconsin NR 400 series of the administrative code. Design of new bio-energy pilot plant requires compliance with all Federal, State, and local environmental laws.

**Threatened, Endangered, and Sensitive Species.** The proposed demolition of existing buildings as described in the proposed action and construction of a new storage facility and bio-energy pilot plant building would have “No Effect” on any federally threatened or endangered species.

**Social Environment.** Implementation of the proposed action would not disrupt or displace any residential housing, commercial structures, or schools. As there would be no significant adverse impacts as a result of proposed demolition of existing buildings as described in the proposed action and construction of a new storage facility and bio-energy pilot plant building, none of the activities would disproportionately affect minority and low-income populations or children under 18 years of age. No changes to the project area would occur under the no-action alternative, so there would be no impacts to environmental justice issues and concerns.

Demolition and construction activities under the proposed action would temporarily elevate noise levels in the immediate area, but these levels would not be constant or long term. To be considered significant, noise levels must be elevated over the long term. The proposed action would have no significant effect on noise levels in the area because the design of the new building will be in compliance with City of Madison's noise ordinance regulations. All demolition activities would comply with the City of Madison's noise ordinance requiring that construction equipment not exceed 88 dB when measured at 50 feet from the source (NPC 2006). The no-action alternative would cause no change to the current noise levels because no demolition would occur.

Mitigation measures require identification of asbestos-containing materials (ACM) and lead paint within the buildings to be demolished. Licensed abatement contractors would be required to properly remove and dispose of all ACM and lead based paint, and to properly dispose or recycle other materials such as mercury switches, fluorescent tubes, and other materials identified within the demolition design. Licensed abatement contractors would be required to comply with all Federal, State, and local requirements. Additionally, FPL will work with WDNR during the building design phase to ensure compliance and all permitting requirements associated with air quality. Emissions from pilot-scale research projects conducted in the bio-energy pilot plant will be monitored. Design of the newly proposed bio-energy pilot plant is required to be in compliance with all Federal, State and local environmental laws.

**Cultural Resources.** Field visits to the project location began on November 18, 2008, to assess the cultural resources and potential historic properties affected by the proposed action. The section 106 consultation under the National Historic Preservation Act, as amended, and following 36 CFR 800 regulation and FSM 2360, was also initiated on that same date through a meeting with Mr. Sherman Banker of the Wisconsin Historical Society. A formal section 106 consultation report was submitted to the Wisconsin Historical Society on March 5, 2009, with a finding of "No Historic Properties Affected" and recommendations for archaeological monitoring during initial project implementation in the vicinities of 47-DA-1244 and 47-DA-1346. The FPL received a letter from the Wisconsin Historical Society on March 13, 2009, stating that no historic properties are located within the proposed project area per 36 CFR 800.4; therefore, there would be no impacts.

## *Cumulative Effects*

### **Past, Present, and Reasonably Foreseeable Future Construction Activities at the Forest Products Laboratory**

**FPL Modernization Project.** In May 2006, the FPL issued a decision to construct a Multi-use Laboratory and other facilities at the Madison campus. The following proposed action was chosen for implementation:

To meet the purpose and need for action, the Forest Service proposes to construct a new multi-use laboratory building to house the FPL's Engineering Mechanics, Composites, Wood Preservation, and Durability Laboratories and shared building support.

The Proposed Action also includes construction of an addition to the existing Fire Research Laboratory, the installation of new equipment in the Advanced Fiber Processing and Paper Products Laboratory, and the renovation of heating, ventilation, and air conditioning in Building One, the administrative office structure. The Proposed Action includes a total of approximately 73,700 square feet of new building footprints within a total earth disturbance area of approximately 3.5 acres (including building footprints, paved areas, and utilities).

The decision document discussed the following for potential cumulative effects:

The most likely potential cumulative effects from this project in combination with other development in the area, including other small construction projects that may be implemented at FPL within the next few years, would result from increased surface water runoff and offsite sedimentation. Due to the planned implementation of NPDES permit requirements, no increase in storm water runoff or sedimentation would leave the project area during or after construction. There would be a temporary increase in noise levels from the construction equipment, but the noise levels would be within the requirements of the City of Madison.

The minor impacts, beneficial or adverse, that may temporarily affect air quality, noise, and land use during construction would not result in significant cumulative effects if the Proposed Action were implemented. In the context of this urban environment, the Proposed Action would not contribute to cumulative impacts on the human environment that would be collectively significant.

**FPL Building 41 Demolition.** In June of 2008, FPL issued a decision to demolish building 41 on the FPL campus. This project involves demolishing building 41, including the below-grade foundation and adjacent asphalt apron; disposing of asbestos and lead paint according to State of Wisconsin requirements; capping, securing, or demolition of site utilities; complete demolition of the structure; and recycling and/or reuse of construction waste. The building foundation would be removed, the site graded for appropriate drainage, and native vegetation and turf restored. The project also includes recycling and/or reuse of as much of the waste stream as possible from building 41. The project was completed in March 2009. No cumulative impacts were identified or associated with this project (USDA 2008).

### Connected Actions by Surrounding Landowners

A Cereal Crops Research Laboratory was recently constructed (2006) by the USDA Agricultural Research Service to the east of the Multi-Use Laboratory proposed site.

### Conclusion

Given the mitigation measures listed previously little to no impacts are anticipated for many of the resources. The most likely potential cumulative effects from this project in combination with other development in the area would result from increased surface water runoff and offsite sedimentation. Due to the implementation of NPDES permit requirements and new building design related to storm water quality control that limits disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and reducing or eliminating pollution from storm water runoff, no cumulative impacts are anticipated. There likely would be a temporary increase in noise levels from the construction and demolition activities caused by equipment; however, no long-term impacts would occur due to compliance with City of Madison noise regulations after construction is completed.

## Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes, and non-Forest Service persons during the development of this EA.

### *Forest Service ID Team Members*

Steve Kalinosky—Forest Products Laboratory General Engineer; Facilities Engineering, and Public Scoping and Comments

Julie Laufmann—USDA Forest Service, ETS Enterprise Unit; Project Manager, Compliance, and other resources

Juliet Gifford—Wildlife Biologist, Chequamegon-Nicolet Forest; Threatened, Endangered, and Sensitive Wildlife Species

Paul Claeysens—USDA Forest Service, Heritage Stewardship Group Enterprise Unit; Heritage

Theodore Wegner—Forest Products Laboratory Assistant Director for Wood, Fiber, and Composites; scientific data and operational concerns for Bioenergy Pilot Plant

### *Federal, State, and Local Elected Officials*

Herb Kohl—U.S. Senate

Russell Feingold—U.S. Senate

Tammy Baldwin—U.S. House of Representatives

Fred Risser—Wisconsin State Senate

Spencer Black—Wisconsin State Assembly

Karl Frantz—Village Administrator, Village of Shorewood Hills

Robby Webber—Alder, City of Madison, District 5

### *Federal, State, and Local Agencies and Organizations*

Todd Ambs—Division of Water Administrator, Wisconsin Department of Natural Resources

Gary Brown—Director, Planning, Construction and Landscape Architecture, University of Wisconsin–Madison

Louise Clemency—U.S. Fish and Wildlife Service

Dane County Lakes and Watershed Commission

Leslie Eisenberg—Burial Sites Program Coordinator, Wisconsin Historical Society

Deborah Thompson—Director, William S. Middleton Memorial Veterans Hospital

Cynthia Henson—Research Leader, Cereal Crops Research Unit, USDA Agricultural Research Service

Larry Nelson—City Engineer, City of Madison

Mark Olinger—Director, Department of Planning and Development, City of Madison

Laurie Osterndorf—Division of Land Administrator, Wisconsin Department of Natural Resources

Allen Shea—Division of Air and Waste Administrator, Wisconsin Department of Natural Resources

Michael E. Stevens—State Historic Preservation Officer, Wisconsin Historical Society

Jack Sullivan—Bureau Director, Integrated Science Services, Wisconsin Department of Natural Resources

George Hall—Strategic Planning Committee Chair, Regent Neighborhood Association

Todd Violante—Director, Dane County Department of Planning and Development  
Kevin Firchow—Department of Planning and Community Economic Development  
Sherman Banker—Office of Preservation and Planning, Wisconsin Historical Society  
Department of Natural Resources, State of Wisconsin

*Tribal Government Representatives*

Mike Allen—Executive Director, Great Lakes Inter-Tribal Council  
The Honorable Adrian Pushetonequa—Tribal Council Chairman, Meskwaki Nation  
The Honorable Wilfrid Cleveland—President, Ho-Chunk Nation

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\* Tiered references within the environmental consequences section can be found in USDA Forest Service 2007 above.

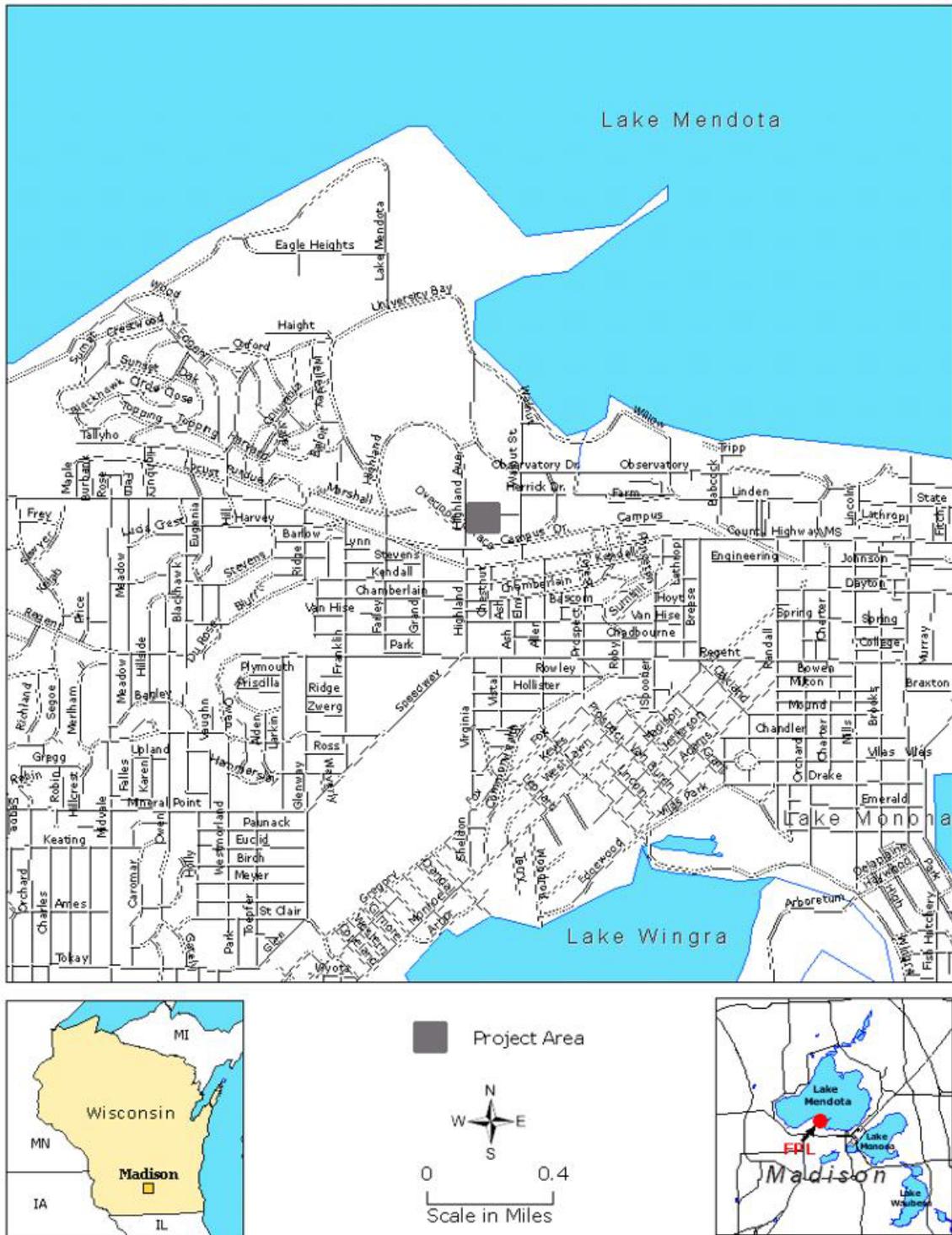


Figure 1. Project area map



**Figure 2. Aerial photo of Forest Products Laboratory proposed buildings for demolition and construction of new bio-energy pilot plant and storage building**



## Appendix A: Summary of Buildings Proposed for Demolition and/or Relocation

For a complete review of all buildings located at FPL see Greenhorne and O'Mara (2004) report.

**Table A-1. Buildings proposed for demolition and/or relocation**

Building	Building Name	Year Built	Gross Square Footage	Building Use
2	Packaging Research	1935	10,319	Research
3	Conditioning Chamber	1939	346	Research
5	Steam Plant	1958	4,770	Utility
8	Composite Product Lab	1935	11,648	Research
19	Composite Products Office	1952	7,312	Office
49 <sup>1</sup>	Storage Building	2004	6,421	Storage

<sup>1</sup> Building 49 was not accessed in the G&O (2004) report.

### *Building 2: Packaging Research*

Building 2 is part of a series of buildings located at the southern end of the FPL site.

#### Architecture

The building is a one-story structure with a rectangular shape. It is wood-framed, with wood glue-lam columns, wood truss ceiling, and wood beams. It has wood glue-lam arches/trusses and a wood roof deck with built-up roof covering. The roof covering is in poor condition. The building exterior is faced with fiberboard siding and is in good condition.

#### *Architectural Deficiencies*

##### a. Exterior Envelope Deficiencies

- Roof is old
- Rusted hollow metal doors
- Old wood frames; caulking brittle

##### b. Building Interior Deficiencies

- Shop office is unused and the finishes have deteriorated
- Vinyl tile in hot drying room is worn and stained and may contain asbestos
- Concrete floors are stained and floor mats are old or missing

#### Mechanical, Electrical, and Plumbing Components

The facility has a 175 to 15 psig steam pressure reducing station at the entrance to the building. The steam is distributed through the facility for heating and research use. No central air conditioning is required in this facility. The humidity room has a water cooled air conditioner. The controls for the humidity room consist of a local humidistat and thermostat. The testing equipment bay is heated using steam unit heaters. No heating is provided to the humidity room. Roof-mounted exhaust fans

provide ventilation only. Windows are opened for make-up air. Restroom vent fans move air, but do not function properly.

The incoming feeder for building 2 comes from the main switchboard located in main electrical room of building 8.

#### *Mechanical or Power Deficiencies*

- There are no mechanical or power deficiencies.

#### **Life Safety and Handicap**

The building has a fire alarm system that is interconnected with the other buildings at the Forest Product Laboratory. The building has a sprinkler system. The interior ceiling height is appropriately less than 20 feet above the finished floor. The required ceiling assembly should have a 1-hour rating; currently this is not in compliance with code.

The vent fans in the restrooms run, but do not move air efficiently. Staff is reluctant to use showers because vent fans do not function properly; this is considered a health issue. Building 2 has two handicap restrooms. Each restroom is provided with a shower stall, toilet, and lavatory. Bathrooms are provided with bathroom accessories. Handicap signage has been provided.

#### *Life Safety and Handicap Deficiencies*

- Door hardware is non-fire rated and lacks panic devices
- Exit sign is not visible in the hot drying room
- Passage to means of egress is obstructed by a radiator that protrudes into the space, and the floor space has a loose wood flooring
- Exit doors are old and have incorrect swing
- Exit signs are missing on some doors
- Vent fans in restrooms do not function properly
- Bathroom hardware is not lever-type
- Towel rack and robe hook are too high

#### **Building 2 Recommendations**

##### a. Immediate repairs (0 to 5 years)

- Re-caulk window openings
- Replace exterior hollow metal doors
- Replace wood frames with hollow metal frames
- Provide concrete stoop at rear exit
- Repair roof
- Replace all exit signs and install over exit doors
- Provide panic hardware on new exit doors
- Lower the towel rack and robe hook installation height
- Provide lever handles for bathroom doors
- Provide lever faucets
- Provide new floor mats at machines

- Renovate shop office
  - Repair or replace vent fans in restrooms
- b. Short term (5 to 10 years)
- Demolish building

### ***Building 3: Conditioning Chamber***

Building 3 is a small conditioning chamber. It is located at the southern end of the FPL site between buildings 2 and 4. The conditioning chamber is for fire research conducted in building 4.

#### **Architecture**

Building 3 is a one-story, wood-framed structure with concrete deck and built-up roof. The built-up roof has been recently replaced. The existing building façade consists of CMU and wood vertical siding. The wood siding is in poor condition. The building has no windows. The exterior door is metal with wood frame. (Building 3 is referred to as the “Chicken Coop”.) The interior of Building 3 consists of two rooms, one behind the other. The first room has an unfinished concrete floor, unfinished drywall and CMU walls, unpainted drywall ceiling, and a wood door. There are no windows except a metal louver vent. All materials and finishes are in poor condition. The second room is the conditioning room. It has a concrete floor, concrete walls, no finishes, and foam insulated ceiling. The door is a metal swing door in a wood frame. There are no windows. The walls are lined with shelves holding wood samples. All materials and finishes are in poor condition.

#### ***Architectural Deficiencies***

- Rusted hollow metal doors
- Old wood frames; caulking brittle
- Rotting wood siding
- Unpainted walls and ceilings
- Floors cracked and dirty
- Drywall is peeling

#### **Mechanical, Electrical, and Plumbing Components**

This unit is used to condition wood for testing. No mechanical systems are installed. Power for this building is provided from building 2. No emergency power is available in this building, and there is no fire alarm system.

#### ***Facility Deficiencies***

- Lighting fixtures are non-energy efficient type
- There are no fire alarm detection devices in this building

#### **Life Safety and Handicap Analysis**

This building occupancy does not require a life safety or handicap compliance analysis.

#### **Building 3 Recommendations**

- a. Immediate repairs (0 to 5 years)
- Replace hollow metal door

- Replace wood door frames and re-caulk
  - Repair wood siding
  - Provide fire alarm detection devices
- b. Short term (5 to 10 years)
- Demolish building

## ***Building 5: Steam Plant***

### **Architecture**

Building 5 is a metal structure with metal panels, metal columns, and metal roof deck with rolled-up bituminous roof. The windows are single-paned metal. The exterior doors are sectional, rolled-up metal. The exterior materials are in poor condition. The floor is concrete; the walls a combination of CMU/wood and metal, the ceiling exposed metal joists, and there are four pedestrian doors. The building is used to store equipment.

### ***Architectural Deficiencies***

- a. Exterior Envelope Deficiencies
- Building structure is not stable
  - Aluminum window are single pane, non-insulated and are broken
  - Sectional doors are worn
  - Metal wall panels are worn
  - Roof is old and leaks
- b. Building Interior Deficiencies
- Finishes have deteriorated from non-use of the building

### **Mechanical, Electrical, and Plumbing Components**

This facility was previously used as the steam plant for the site. Steam is now purchased from the University of Wisconsin and the boilers have been removed. The steam from the University of Wisconsin ties into the old steam headers in this building. From there, the steam is distributed throughout the site as it was when the boilers were in place. The facility is no longer occupied

The main power source for this building is provided from a transformer mounted on a nearby pole. Emergency power for this building consists of a 75 KW, gas generator set rated for 240V, 3-phase. Interior lighting consists of high bays and fluorescent lighting fixtures. Exterior lighting consists of wall packs and floodlights. Generally, lighting system is in poor condition.

### ***Mechanical and Power Deficiencies***

The only purpose for this building is to serve as the junction between the old steam distribution system and the steam main from the University of Wisconsin.

### **Life Safety and Handicap**

Not applicable to building 5.

## Building 5 Recommendations

### a. Immediate repairs (0 to 5 years)

- Demolish building
- Placement of the steam service in an underground steam manhole should be programmed (*Note: The piping in this building is a source of unnecessary energy loss. The existing piping is exposed to open air circulation and additional energy is lost from the steam and condensate piping. These losses can be reduced by placing these connections underground.*)
- Program removal of control center
- Program removal of generator

## *Building 8: Composite Products Laboratory*

Building 8 is a long narrow structure that sets below building 19, the Composite Products Office, at the south end of the FPL site. The two buildings are offset except for one portion of building 8, which is located directly under a section of building 19. The buildings are connected with two stairways, one interior to both structures and one interior to one and exterior to the other. Building 8 is used by the Performance Engineered Composites department and the Modified Ligno-cellulosic Materials department.

### Architecture

The building is a rectangular one-story wood-framed building. It has a wood truss and wood roof deck and asphalt shingle roof. The building is faced with fiberboard siding.

There are several components to the interior of this laboratory: the melt blend room, the press laboratory, the wet press room, and the future performance standards laboratory. Support areas in Building 8 include a tool room, electrical room, steam room, and restroom.

### *Architectural Deficiencies*

#### a. Exterior Envelope Deficiencies

- Old wood frames; caulking brittle

#### b. Building Interior Deficiencies

- Walls in building are mixed materials
- Walls are stained and have holes
- Floors are stained and mats are old or missing
- Concrete floor of restrooms is cracked and uneven

## Mechanical, Electrical, and Plumbing Components

Heating is by using steam unit heaters. No ventilation system is provided for this facility; the industrial processes provide exhaust. This facility is used in composite research. Research equipment used in the facility must have exhaust systems in order to protect the user from off-gassing. The exhaust intake for the current machines are at eye level and the exhaust fan operates whenever the equipment is in use.

The incoming underground service for building 8 comes from a good condition, pad-mounted transformer located in the main electrical room.

There is no emergency panel in this building. The lighting system consists of fluorescent lamp lighting fixtures, some with T12 and some with T8 lamps. The fire alarm system has been upgraded; all the areas are sprinkled.

### *Mechanical and Power Deficiencies*

#### a. Mechanical Deficiencies

- A recent facility modification included installation of a new oil heater for a process press. The cooler for the hot oil uses one pass domestic water. However, no drain was provided and the water is currently dumped through an open door to the exterior of the facility. This can generate dangerous icy conditions during inclement weather.
- During interviews with Forest Products Laboratory personnel, it was determined that the current exhaust system is inadequate for new generation adhesives that are under research and in development. These new adhesives generate particles that are heavier than air and require an exhaust system that would properly exhaust the floor area around the machine. Only limited research on new generation adhesives can be done at the Forest Products Laboratory due to the lack of proper exhaust and ventilation systems. Performing research on new generation adhesives with the current ventilation system puts the researchers at risk.

#### b. Facility Deficiencies

- The industrial processes for this facility generate potential health-threatening waste gases. The exhaust systems must be adequate to provide proper airflow and to capture contaminants.

#### c. Electrical Deficiencies

- Panels “PP4” and “A1P6” are in poor condition.
- There is no emergency power available for this building.
- No smoke or heat detectors have been provided in some areas, including the electrical room.

### **Life Safety and Handicap**

Building 8 has a fire alarm system that is interconnected with the rest of the buildings at the Forest Product Laboratory. The building is sprinkled. The exterior double doors are 20-minute fire-rated and are provided with lever handles and delayed closer. The other exterior single doors are non-fire rated and do not have panic hardware. The exterior door’s swing is towards the inside of the building. Handicap accessibility is adequate in building 8.

### *Life Safety and Handicap Deficiencies*

- Some egress door hardware is non-fire rated and lacks panic devices
- Exit signs are old
- Exit doors have incorrect swing
- Exit signs are missing on some egress doors
- Additional exit signage is needed at center of rooms to clearly indicate means of egress
- Mezzanine storage is an open space; and does not have 1-hour rated walls
- Bathroom facility is not ADA accessible
- Ramp is too steep (more than 1:12)

- No railing is provided on either side of the ramp
- Vestibule/corridor width is too narrow
- Interior door hardware is not lever type

## Building 8 Recommendations

### a. Immediate Repairs (0 to 5 years)

- Replace wood frames with hollow metal frames and re-caulk
- Replace egress door hardware with fire-rated hardware
- Replace exit signs and provide additional ones at center of rooms for clear visibility.
- Provide vinyl floor in existing bath room
- Have all exhaust intakes tested and evaluated to insure that the proper capture velocity is maintained at the breathing zone.
- Re-pipe the oil cooler discharge pipe to a sanitary drain
- Replace panels PP4 and A1P6.
- Provide smoke detection devices where missing to meet code requirements.

### b. Short Term (5 to 10 years)

- Resurface concrete floors and provide floor mats at machines
- Relocate storage area or enclose with 1-hour rated assemblies
- Provide ADA restroom
- Provide ADA railings on ramp and correct slope
- Provide lever hardware for interior doors
- Replace existing T12 fluorescent lighting fixtures with energy efficient T8 lamps, fluorescent lighting fixtures
- Provide individual demand meters at the main switchboard "APPI"
- Provide an emergency panel for this building for all life safety equipment; generator proposed for building 2 may feed this emergency panel

### c. Long Term (10 to 15 yrs)

- Demolish building

## ***Building 19: Composite Products Office***

Building 19 is the administrative facility for the composite products team. The building is located to the south of building 1.

### Architecture

Building 19 is a one-story wood framed building. The exterior walls are a combination of concrete masonry units (CMU) and hardboard siding. The roof system consists of wood truss with wood deck and asphalt shingle roof with a guttering system. The interior space of building 19 is a long, narrow building that has been recently renovated. An addition was added to the east end approximately 4 years ago. The addition has a lower floor that connects to building 8. The lower floor houses a weight room and a maintenance room. There are 14 offices, a copy room, 2 restrooms, a conference room, kitchenette, janitor closet, library research room, and lobby on the main floor of this building.

### *Architectural Deficiencies*

#### a. Exterior Envelope Deficiencies

- Asphalt shingles on roof are old
- Gypsum board soffit is stained

#### b. Building Interior Deficiencies

- None

### **Mechanical, Electrical, and Plumbing Components**

The steam for this facility is provided via a steam pressure reducing station located in building 8. This facility uses hot water for heating, and a variable air volume air conditioning system for cooling. Staff reports that the air conditioning in the western half of the building is not properly sized to cool offices, so the interior temperatures rise dramatically on warm days.

This building is powered from panel located in the main electrical room in building 8. This building does not have emergency power available.

The lighting system, which consists of fluorescent fixtures, is in good condition. The fire alarm system for this building has been upgraded; smoke detectors have been provided in the corridor only. There is no sprinkler system found in this building.

### *Mechanical and Power Deficiencies*

- The condition of the equipment for this facility is extremely poor for a facility constructed this recently.
- VAV heating coils are leaking and show evidence of poor water treatment.
- The outdoor air system dampers no longer function; as a result, the energy saving opportunity afforded by the economizer function in the new air handler is lost.
- The motor for the air handler may have a bad bearing.
- The maintenance staff does not know how to operate or adjust the control system.
- There is no emergency power available for this building.
- Smoke detectors have been provided in the corridor only.

### **Life Safety and Handicap**

The main occupancy in building 19 is general offices. There are approximately 15 people working in this building. Two opposite means of egress are provided along the main central exit corridor. One exit discharges directly to an open parking space; the other exit discharges to the main lobby of the building. From the lobby, two exits are provided that discharge to open green spaces.

Some exit doors do not have the adequate swing for the egress flow. Some doors have half lights and are provided with panic hardware. The doors did not have fire-rated labels. Handicap accessibility is fair in building 19.

### *Life Safety and Handicap Deficiencies*

- Common paths of travel are more than the 75 feet allowed by Code
- Conference door lacks exit sign
- Office doors along corridor are not fire-rated assemblies

- Exit door from the corridor has incorrect swing
- Floor elevation between corridor and lobby is not leveled
- Bulletin boards along the main central corridor are an obstacle in the means of egress
- Not all exit doors are provided with panic and exit hardware
- Building lacks a sprinkler system
- Toilets are not mounted at the correct height
- Doors are not equipped with delayed closers
- Exercise room is not ADA accessible

## Building 19 Recommendations

### a. Immediate Repairs (0 to 5 years)

- Provide adequate swing to some exit doors
- Provide additional exit signs
- Provide panic hardware to some exit doors
- Remove bulletin boards from main central corridor walls
- Level variance in floor finishes between corridor and lobby spaces
- Re-install ADA toilets at required height (17 to 19-inches)
- Install ADA delayed closer on exit doors
- Establish a routine maintenance schedule for this facility
- Contact the original installer of the control system for maintenance and instructions
- Contact water treatment companies for consultation and service

### b. Short Term (5 to 10 years)

- Replace roof coverage
- Replace gypsum board soffit
- Relocate exercise room (weight room)
- Provide sprinkler system
- Provide an emergency panel for life safety equipment; this panel may be fed from the emergency generator proposed for building 2
- Provide additional smoke detectors to meet code requirements

### c. Long Term (10 to 15 years)

- Demolish building

## ***Building 49: Storage Building***

Built in autumn 2004, after the survey/visit by GH&O, building 49 is a 6,421 square foot PEB (pre-engineered, metal building) with concrete foundations and floor slab. The walls are un-insulated, corrugated metal, but the roof is insulated. It has no environmental controls, water, or sewer. The only utility is electricity for the overhead lighting and doors. Proposed demolition of building 41 is not a function of the building condition or new replacement facilities (obsolescence) as in the case of the other buildings to be demolished. Instead, the building 41 demolition is a matter of best use for the property – to make room for the proposed Bioenergy Pilot Plant.