CHAPTER FIVE

Environmental and Land Use Plan

5.0 OVERVIEW

The purpose of this chapter is to present an overview of environmentally sensitive features and land uses on and surrounding the Airport, and to identify potential impacts to these features and land uses resulting from the recommended development plan. Known or easily visible environmental resource categories were assessed in conformance with applicable FAA environmental guidance, and applicable federal, state and local regulations. The environmental overview is not intended as a substitute for a National Environmental Policy Act (NEPA) document. Rather, the intent is to provide information regarding environmental resources for general airport planning purposes. This information is included in the following sections:

- Airport Vicinity Land Use Inventory and Zoning
- Aircraft Noise Analysis
- Airport Property Land Use Controls
- Environmental Resources
- Sustainability Opportunities

5.1 AIRPORT VICINITY LAND USE INVENTORY AND ZONING

According to the 2011 Wisconsin Airport Land Use Guidebook, incompatible land uses are those that constrain safe and efficient airport operations, or those that expose people living or working nearby to noise or other aviation hazards. Land uses that are least compatible with airports include structures with large densities of people, streetlamps and buildings that emit bright light, dust-producing smokestacks that cause visual and physical obstructions, and ponds and large wetlands that attract wildlife. Other incompatible land uses include farmland, residential developments, and office buildings. This section discusses urban land uses in the vicinity of the Airport, such as residences, factories, parks, and group assembly land uses. Wetlands, farmlands, wildlife attractants, and other environmental resources are discussed in Section 5.4.

5.1.1 Land Use Inventory

Land uses within a one-mile radius of the Airport were analyzed to assess their compatibility with long-term development recommended by this Master Plan Update. Sources of land use information included City and County zoning classifications, municipal land use plans, and recent aerial photography of the area. Existing and planned future land uses for all land in the vicinity of the Airport (one mile beyond each runway end and one-half mile parallel to the sides of the runway) are presented in **Figure 5-1**.

One-family, two-family, and non-sewered one-family residential land uses (City zoning classifications R1, R2, and R1A) are located immediately adjacent to the west, southwest, south, and southeast of Airport property. A large industrial area (City zoning classifications I1 and I2) is located to the east of the Airport, and the nearest commercial land uses (City zoning classifications C2 and C3) are located along the U.S. Highway 53 (business) corridor approximately one-half mile east of the Airport. Areas surrounding the northern extent of Airport property are mostly outside Eau Claire city limits and are generally less developed than those areas to the west, south, and east. However, there is some low-density residential development in areas between the Airport and the Chippewa River, while most areas north of the Chippewa River are undeveloped or in agricultural production.

There are four schools (North High School, Northstar Middle School, Sam Davey Elementary School, and Locust Lane Elementary School) located within one mile of the Airport. All four schools are located southeast of the Airport, within or near the approach path to Runway 32. There are also two places of worship (Hope Lutheran Church and St. Olaf Catholic Church) within one-half mile of the Airport. These churches are also located to the southeast within the approach to Runway 32. Potential future extension of Runway 14/32 to the southeast may present incompatibility issues with these land uses and should be avoided, if possible. There are no hospitals within one mile of the Airport.

The nearest recreational uses are Lake Hallie Golf Course, Sundet Park, Riverview Park, and Hallie Park. Lake Hallie Golf Course, Sundet Park, and Hallie Park are located to the northeast, and Riverview Park is to the southwest. These recreational uses are sufficiently removed from the Airport such that they are not incompatible with Airport operations.

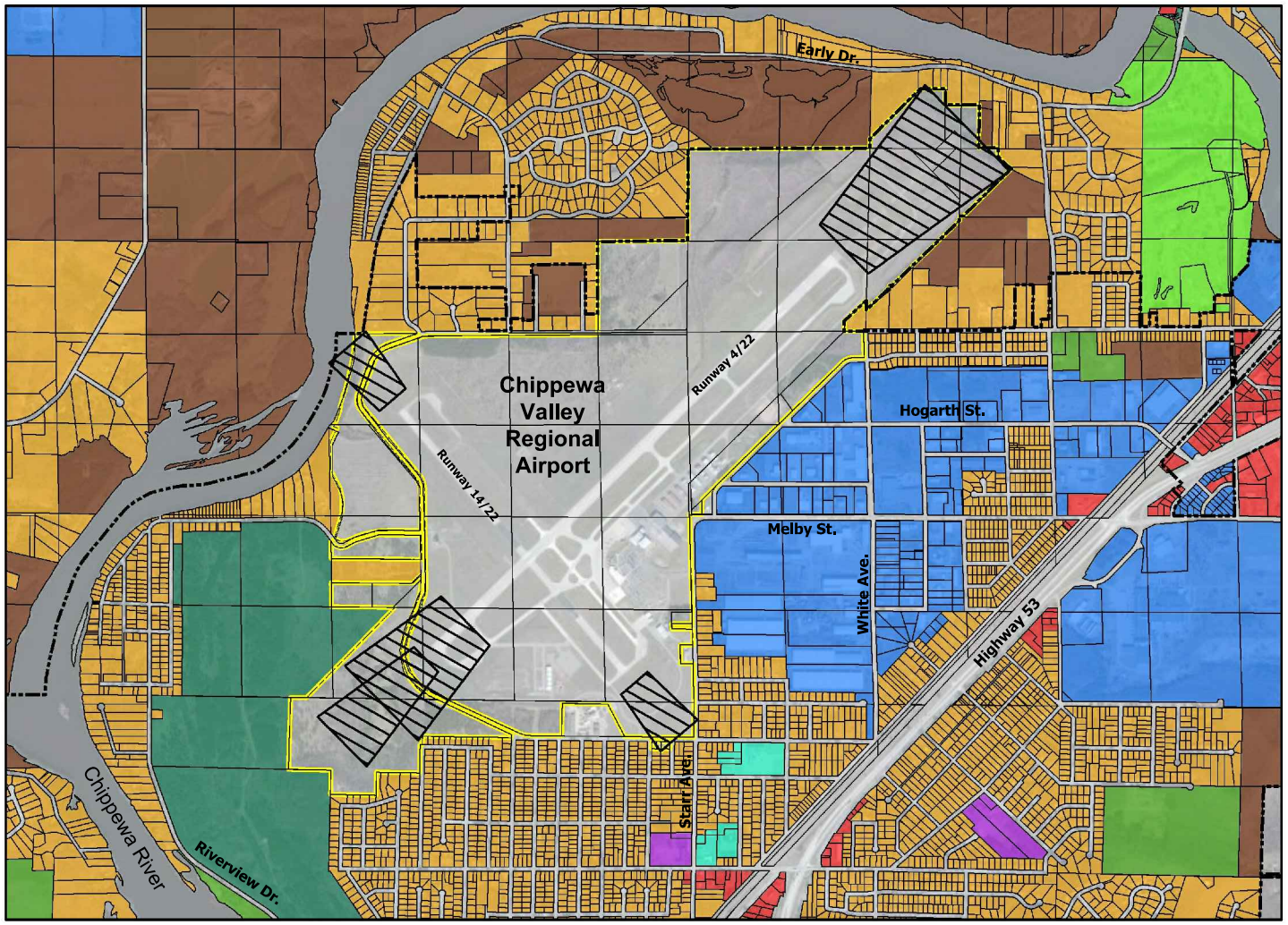


FIGURE 5-1

Airport Vicinity Land Uses

Legend

- RUNWAY PROTECTION ZONES
- AIRPORT PROPERTY
- EAU CLAIRE CITY LIMITS
- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- RELIGIOUS
- SCHOOL
- PARK
- GOLF COURSE
- PUBLIC/OTHER
- AGRICULTURAL/UNDEVELOPED

NORTH

0 1,250' 2,500'

PREPARED BY:

Mead & Hunt

MASTER PLAN
CHIPPEWA VALLEY REGIONAL AIRPORT (EAU)
EAU CLAIRE/CHIPPEWA FALLS, WI
May 2013

Chippewa Valley REGIONAL AIRPORT

5.1.2 Runway Protection Zones

As discussed in Chapter 1, a runway protection zone (RPZ) is a trapezoidal area located beyond a runway end and centered on the runway centerline, the function of which is to enhance protection of people and property on the ground. Airport owner control over the RPZ is emphasized by the FAA to achieve the desired protection of people and property on the ground, and the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses within the RPZ.

The RPZs at EAU are depicted in Figure 5-1 on the previous page. The Airport currently has sufficient property interest over all of its RPZs to protect against the future development of incompatible land uses. However, future changes in runway ends resulting from runway extensions or the relocation/displacement of landing thresholds may result in the shifting of RPZs into areas that are not currently owned or controlled by the Airport. Based on the recommended development alternative presented in Chapter 4, the expected future change to the Runway 4 landing threshold location is not expected to result in the approach or departure RPZs being located outside current airport property. The installation of an approach lighting system as recommended in Chapter 4 would likely result in an increase in the size of the approach RPZ due to lower approach visibility minimums; however, it is unlikely that this system would be installed within the next ten years.

Potential future extension of Runway 14/32 and/or the publication of a non-precision instrument approach procedure to Runway 14/32 may require acquisition of new lands within the RPZ. An extension to Runway 14/32 is unlikely within the next ten years based on current airport activity, but a non-precision instrument approach procedure to Runway 14/32 is very likely within the next ten years given the rapid advancement of satellite-based global positioning system (GPS) technology. However, the RPZs on either end of Runway 14/32 will increase over their current size only if the lowest approach visibility minimum for the non-precision instrument procedure were to be less than one statute mile.

On September 27, 2012, the FAA issued new interim guidance on land uses within an RPZ. This new guidance states that regional FAA staff must consult with the National Airport Planning and Environmental Division when specific incompatible land uses would enter the limits of the RPZ as a result of:

1. An airfield project (e.g. runway extension, runway shift).
2. A change in the critical design aircraft that increases the RPZ dimensions.
3. A new or revised instrument approach procedure that increases the RPZ dimensions.
4. A local development proposal in the RPZ (either new or reconfigured).

Land uses considered by this interim guidance to be incompatible with the RPZ include the following:

- Buildings and structures
- Recreational land uses
- Transportation facilities, including railroads, public roads/highways, and vehicular parking facilities
- Fuel storage facilities
- Hazardous material storage
- Wastewater treatment facilities
- Above-ground utility infrastructure

Although there are currently public roads and above-ground utility infrastructure within several of the Airport's RPZs, these are existing conditions that are commonly "grandfathered" by the FAA. However, the Airport should be cautious when considering airfield changes or new land uses that will affect its RPZs.

5.1.3 Airport Zoning Ordinance

As discussed in Chapter 1, Eau Claire County has enacted an airport zoning ordinance that regulates land uses and structure heights on all lands and waters within three statute miles from the boundaries of the Airport (County Code Chapter 18.60, *Airport Zoning*). The purpose of zoning restrictions within an area surrounding an Airport is to protect neighboring land uses from noise and aviation hazards, such as aircraft crashes. The airport zoning ordinance provides for four separate zoning districts – Zones A, 1, 2, and 3 – with specific land use restrictions and setbacks applied to each defined area. Allowable land uses within these four districts are listed in Chapter 1. The airport zoning ordinance also limits the height of buildings, structures, and objects of natural growth in the vicinity of the Airport, such that new objects do not become obstructions to Airport arrivals and departures (for more information, see Section 5.3.3).

The County airport zoning ordinance has been used as a model ordinance by WisDOT Bureau of Aeronautics (BOA), and it allows the County to exercise sufficient control over neighboring land uses. However, the airport zoning ordinance should be modified whenever there are proposals for airport expansion or significant changes to aircraft operating procedures in the vicinity of the Airport. When determining whether a specific project involves significant land use impacts, the FAA considers consequences such as community disruption, business relocations, induced socioeconomic impacts, wetland or floodplain impacts, or critical habitat alternations associated with the proposed project.

5.2 AIRCRAFT NOISE ANALYSIS

When evaluating proposed airport projects, airport noise is often the most controversial environmental impact that the FAA examines. Noise compatibility planning is essential for an airport to maintain a positive relationship with its neighbors and mitigate noise-related land use compatibility concerns. Chippewa Valley Regional Airport was originally constructed with sufficient distance from noise-sensitive areas to avoid such concerns. However, the Eau Claire-Chippewa Falls community has grown in the years since the Airport's original construction and more noise-sensitive land uses have been established closer to the Airport.

"Sound" is defined as transmitted vibrations that can be detected by the human ear, while "noise" is defined as any sound that is undesirable or interferes with people's ability to hear other sounds. The degree of annoyance which people suffer from aircraft noise varies depending on their activities at any given time. Studies by governmental agencies and private researchers, in particular those by the U.S. Department of Housing and Urban Development (HUD) and the FAA, have defined the compatibility of land uses with varying noise levels. Day-night average sound level (DNL), expressed in decibels (dB), is the standard Federal metric for determining cumulative exposure of individuals to noise. The compatibility of various land uses with yearly day-night average sound levels is summarized in **Table 5-1** on the next page.

Table 5-1: Land Use Compatibility with Yearly Day-Night Average Sound Levels						
	Yearly Day-Night Average Sound Level (DNL) in decibels					
Land Use	**Below 65**	**65-70**	**70-75**	**75-80**	**80-85**	**Over 85**
Residential						
Residential, other than mobile homes and transient lodgings	YES	NO (1)	NO (1)	NO	NO	NO
Mobile home parks	YES	NO	NO (1)	NO	NO	NO
Transient lodgings	YES	NO (1)	NO (1)	NO (1)	NO	NO
Public Use						
Schools	YES	NO (1)	NO (1)	NO	NO	NO
Hospitals and nursing homes	YES	25	30	NO	NO	NO
Churches, auditoriums, and concert halls	YES	25	30	NO	NO	NO
Government services	YES	YES	25	30	NO	NO
Transportation	YES	YES	YES (2)	YES (3)	YES (4)	YES (4)
Parking	YES	YES	YES (2)	YES (3)	YES (4)	NO
Commercial Use						
Offices, business, and professional	YES	YES	25	30	NO	NO
Wholesale and retail building materials, hardware, and farm equipment	YES	YES	YES (2)	YES (3)	YES (4)	NO
Retail trade (general)	YES	YES	25	30	NO	NO
Utilities	YES	YES	YES (2)	YES (3)	YES (4)	NO
Communication	YES	YES	25	30	NO	NO
Manufacturing and Production						
Manufacturing (general)	YES	YES	YES (2)	YES (3)	YES (4)	NO
Photographic and optical	YES	YES	25	30	NO	NO
Agriculture (except livestock) and forestry	YES	YES (6)	YES (7)	YES (8)	YES (8)	YES (8)
Livestock farming and breeding	YES	YES (6)	YES (7)	NO	NO	NO
Mining and fishing, resource production and extraction	YES	YES	YES	YES	YES	YES
Recreational						
Outdoor sports arenas and spectator sports	YES	YES (5)	YES (5)	NO	NO	NO
Outdoor music shells and amphitheaters	YES	NO	NO	NO	NO	NO
Nature exhibits and zoos	YES	YES	NO	NO	NO	NO
Amusements, parks, resorts, and camps	YES	YES	YES	NO	NO	NO
Golf courses, riding stables, and water recreation	YES	YES	25	30	NO	NO

Source: FAA Environmental Desk Reference for Airport Actions

Note: *Numbers in parentheses refer to notes; see continuation of Table 5-1 on the next page for notes and key.*

Table 5-1: Notes and Key	
NOTE: The designations in this table do not constitute a Federal determination that any use of land is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with local land use authorities. FAA determinations under Part 150 are guidelines and are not intended to substitute for land uses determined to be suitable by local authorities in response to locally determined needs and values in achieving noise compatible land uses.	
Key to Table 5-1	
YES	Land use and related structures compatible without restrictions.
NO	Land use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35	Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.
Notes for Table 5-1	
(1)	Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, use of NLR criteria will not eliminate outdoor noise problems.
(2)	Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
(3)	Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
(4)	Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
(5)	Land use compatible provided special sound reinforcement systems are installed.
(6)	Residential buildings require an NLR of 25.
(7)	Residential buildings require an NLR of 30.
(8)	Residential buildings not permitted.

DNL is a 24-hour measure of total noise, with events occurring at night (10 p.m. to 7 a.m.) treated as 10 dB louder than they actually are. The dB penalty is designed to account for the fact that events at night are often perceived to be more intrusive because nighttime ambient noise is less than daytime ambient noise. The FAA, U.S. Environmental Protection Agency (EPA), and HUD have established the 65 DNL contour as the threshold indicating significant cumulative noise impacts.

Noise impact areas for an airport are identified by noise contours. The basic methodology used to define aircraft noise levels is to use the FAA's accepted mathematical model, the Integrated Noise Model (INM). Noise levels are indicated by a series of contour lines superimposed on a map of the airport and its environs. By creating these contours, the Airport can identify areas that are most likely to be impacted by aircraft noise and can plan accordingly. Three basic noise impact areas, or "noise corridor zones", are identified by the 2011 Wisconsin Airport Land Use Guidebook:

- Severe Noise Impact Areas (70 DNL contour and above)
- Substantial Noise Impact Areas (65 to 70 DNL contour)
- Moderate Noise Impact Area (55 to 65 DNL contour)

Federal Aviation Regulations (FAR) Part 150 specifically states that determinations of noise compatibility and regulation of land use are purely local responsibilities. Per FAA Order 1050.1E, projects at airports

that experience 90,000 annual piston-powered aircraft operations or 700 annual jet-powered aircraft operations that involve siting a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise exposure maps.

5.2.1 2011 Noise Exposure Map

New noise exposure contours were developed for this Master Plan Update using the INM. These contours were calculated based on the historical 2011 operations counts presented in Chapter 2. Development of the 2011 noise exposure contours took into account current aircraft fleet mix, runway end utilization, and aircraft flight tracks at EAU. The resulting 2011 noise exposure map is shown in **Figure 5-2**. As shown in Figure 5-2, the current 70 DNL contour (Severe Noise Impact Area) and 65 to 70 DNL contour (Substantial Noise Impact Area) is almost entirely contained on Airport property, with the notable exception of a few residential properties located to the east of the Runway 22 hold bay where aircraft run-ups occur. These properties are located with Zone 2 (Noise Control/Overflight District) of the County airport zoning ordinance. Construction requirements for residential, commercial, and industrial structures within Zone 2 must provide a minimum of 10 dB outdoor-to-indoor noise level reduction over industry standards for similar structures. These requirements adequately address noise-related concerns for residential properties in this area.

A considerable portion of two residential areas – one to the immediate south of the Airport and one in the approach to Runway 22 northeast of the Airport – are within the current 55 DNL to 65 DNL contour (Moderate Noise Impact Area). The residential area south of the Airport is located within Zone 2 (Noise Control/Overflight District) and the residential area northeast of the Airport is located within Zone 1 (Runway Approach and Departure District). As mentioned previously, construction requirements for structures Zone 2 provide adequate mitigation for noise-related concerns associated with these noise levels. According the County airport zoning ordinance, residential uses are not allowed in Zone 1; therefore new residential uses within the 55 to 65 DNL contour in this area are not likely to be approved in the future.

Although residential land uses are considered compatible with noise exposure levels below 65 DNL under Federal regulations, "the responsibility for determining the acceptable and permissible land uses [with relation to airport noise] rests with local authorities." Absent an established local noise standard, noise contours below 65 DNL may be included in environmental documents for informational/disclosure purposes, if the Airport sponsor so desires. Inclusion of contours below 65 DNL on the noise exposure map in Figure 5-2 does not imply that noise mitigation is required in these areas.

5.2.2 2031 Noise Exposure Map

It is possible that future expansion of the Airport, as well as changes in aircraft fleet mix and operating procedures, may result in noise impacts to neighboring land uses. It is important that the Airport maintain land use compatibility with respect to Airport noise, to the extent that is practical and feasible. For this reason, projected noise exposure contours for the year 2031 were developed for this Master Plan Update. Development of the 2031 noise exposure contours took into account the projected aircraft fleet mix and activity levels presented in Chapter 2, as well changes to operating procedures associated with airfield development alternatives recommended in Chapter 4. The resulting 2031 noise exposure map is shown in **Figure 5-3**.

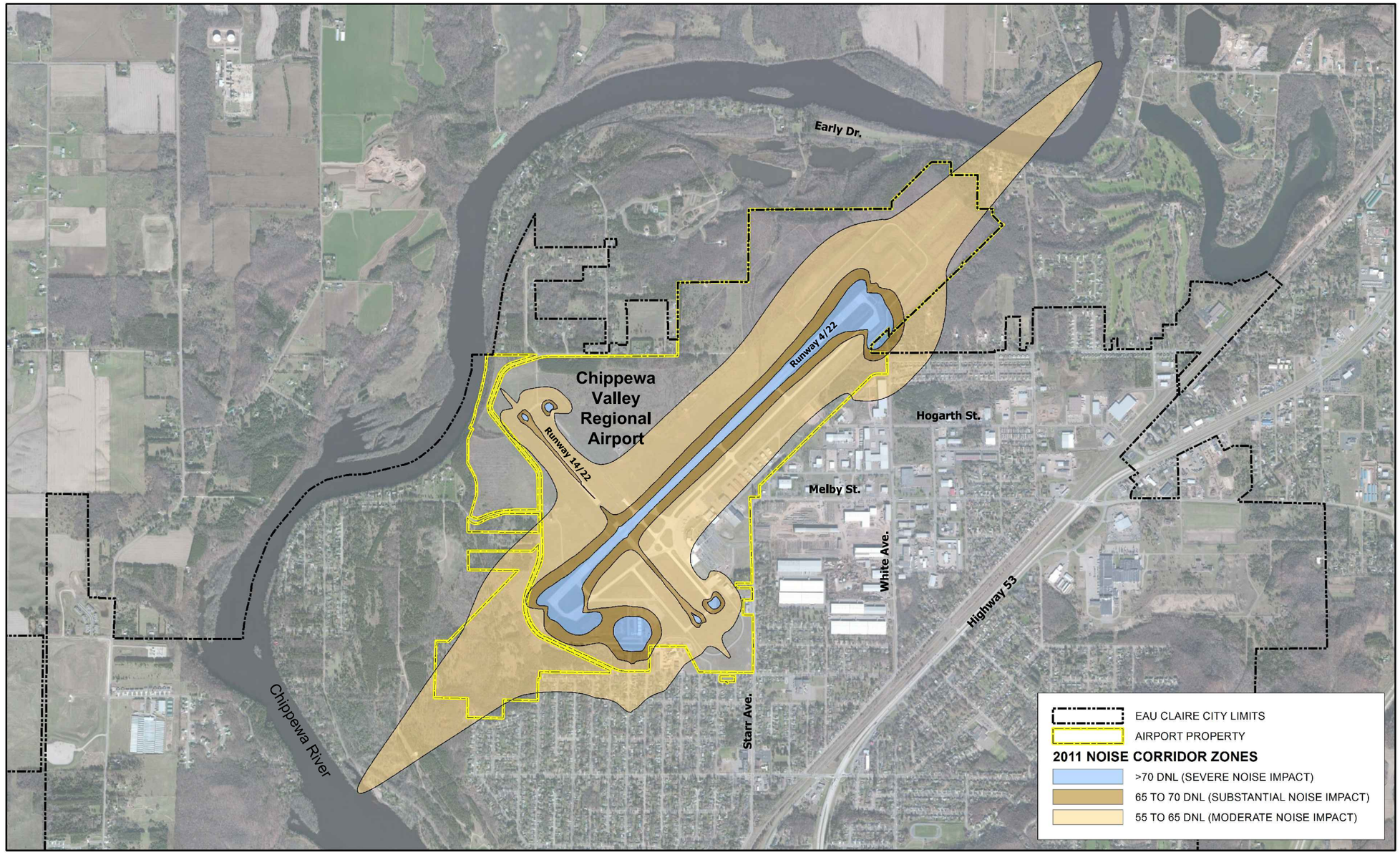
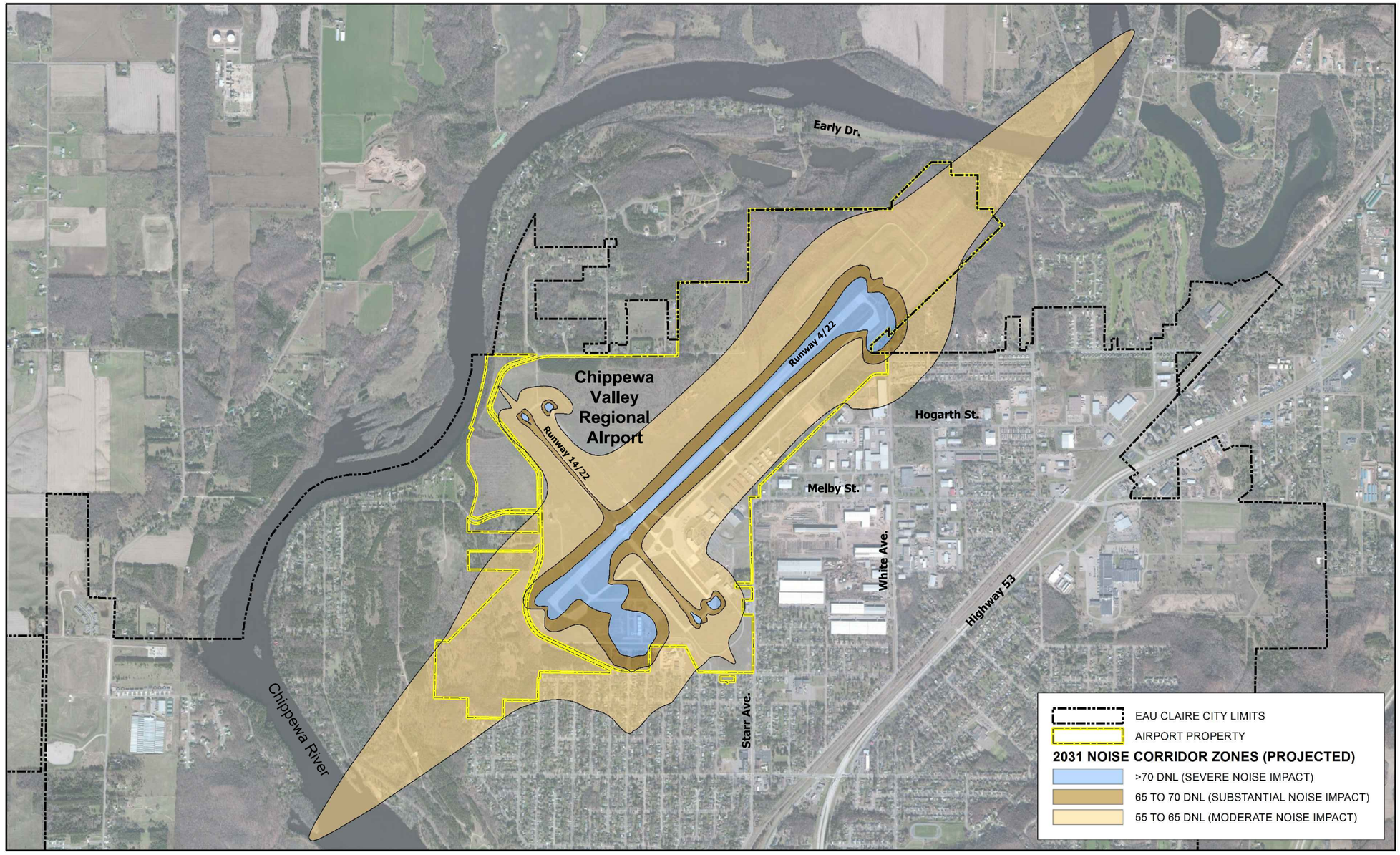


FIGURE 5-2

2011 Airport Noise Exposure Map

FIGURE 5-3

2031 Airport Noise Exposure Map



NORTH

0 1,000' 2,000'

Based on the projected 2031 noise contours, noise impacts to neighbors located south of the Airport and near the Runway 22 hold bay are expected to increase due to anticipated future increases in aircraft run-ups and operations in these areas. The Airport should seek to minimize these potential future impacts by enhancing operator awareness of noise-sensitive land uses in this area, and reducing the frequency of aircraft run-ups in these areas during nighttime hours, if possible.

The long-term Airport noise exposure map should be revised periodically to account for fleet mix changes, advancements in aircraft engine technology, and future Airport development projects not foreseen by this Master Plan Update.

5.3 AIRPORT PROPERTY LAND USE CONTROLS

This section discusses local land use controls contained in the City of Eau Claire and Eau Claire County municipal codes that are currently in place on Airport property. The purpose of this discussion is to assess the purpose and effectiveness of these controls, and to categorize facilities and land uses proposed by this Master Plan Update in relation to these controls.

5.3.1. City/County Land Use Controls

The Airport is officially zoned "P" (public properties district) by the City of Eau Claire. The public properties district "allows for public use of certain areas, such as parks, playgrounds, schools, governmental uses, or other public areas." While the majority of the Airport is located within Eau Claire city limits, the Airport is also under the jurisdiction of Eau Claire County's airport zoning ordinance. Under the County airport zoning ordinance, all airport property is located in Zone A (Airport District). According to Section 18.60.050, Part I, regulations in the airport zoning ordinance "pertaining to Zone A shall supersede and control over any local regulation to the contrary." Based on this provision, the County airport zoning ordinance supersedes the City zoning ordinance within Zone A.

According to the County airport zoning ordinance, Zone A encompasses areas exposed to excessive aircraft noise, areas within aircraft approach and departure areas, and areas within airport crash hazard areas. Zone A is "established to implement the recommendations of the airport master plan, to protect the approaches of the airport from incompatible land uses, to preserve the airport's ability to serve its present and future air transportation needs, and is intended to include all county land owned for airport purposes." Any expansion, alteration, or enlargement to any building, structure, or property within this zone must be consistent with the airport master plan, as amended, and approved by the County Planning and Development Department. Permitted uses and structures in Zone A are those "that are directly related to and necessary for the function and operation of the airport", as follows:

- Air Terminals;
- Aircraft Hangars;
- Aircraft runways, taxiways, aprons, and related lighting and air support apparatus;
- Airport administration buildings;
- Airport maintenance, rescue, and firefighting buildings;
- Aircraft repair and maintenance buildings and facilities;
- Fuel storage and pumps;

- Commercial uses directly related to airport operations;
- Public gathering in conjunction with an airport-related activity sponsored or approved by the airport;
- Air cargo facilities;
- Intermodal facilities; and
- Other related airport uses and structures.

Because they are all directly related to airport operations, all of the specific development alternatives recommended by Chapter 4 are currently permitted as-of-right in Zone A. According to Section 18.60.070, Part D, "in any airport zone, whenever a [land] use is neither specifically permitted or denied, the use shall be considered to be prohibited." Conditional uses not specifically permitted or denied by the airport zoning ordinance may be considered on a case-by-case basis by the County's Committee on Planning and Development. Approvals for conditional uses may include specific performance standards that must be met by the proposed land use.

5.3.2. Recommendations

The County airport zoning ordinance provides specific guidance as to what land uses and structures are permitted within Zone A. However, there are some undeveloped areas on Airport property within Zone A that are not exposed to excessive airport noise; that do not infringe on aircraft approaches and departures; and that are not crash hazard areas. These include areas northeast of the existing small general aviation (GA) hangars; north of the intersection of Runway 4/22 and Runway 14/32; near the air traffic control tower (ATCT); and portions of the future south GA hangar development area. Although conditional uses may currently be considered under the existing airport zoning ordinance, provisions of the ordinance that restrict land uses and structures in Zone A to those "directly related to airport operations" impose undue restrictions on potential future development of non-aeronautical land uses in the areas mentioned above. Non-aeronautical commercial and industrial land uses that are compatible with Airport operations in these areas have potential for increasing Airport revenue and promoting local economic development. The County should consider revising its ordinance to include a new "Airport Business" zone that allows for more streamlined approval of compatible commercial and industrial land uses on specific portions of Airport property.

The current City zoning of the Airport as within Zone P (public properties district) is not appropriate for the Airport because it does not specifically mention aeronautical uses, nor does it allow for compatible commercial and industrial uses as recommended above. To eliminate confusion between the two ordinances, this Master Plan Update recommends that the City of Eau Claire officially incorporate a Zone A into its zoning ordinance that is identical to the Zone A adopted by the County, and to rescind Zone P on Airport property. At a minimum, the City zoning ordinance should note the existence of the County airport zoning ordinance, and that the County zoning designations supersede the City designations.

5.3.3. Airport Height Limitation Zoning Ordinance

The primary goal of airport land use compatibility planning is to temper operational risk by reducing or eliminating safety hazards surrounding airports. The FAA provides basic guidance regarding airspace in the vicinity of an airport that should be protected from tall buildings, structures, and objects. This guidance is described in Federal Aviation Regulations (FAR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. It should be noted that tall objects in the approach surfaces may pose risks even if they do not penetrate the defined Part 77 surface and they can adversely affect minimum instrument approach altitudes.

While the most critical locations are beneath the airport and approach surfaces, the siting of tall facilities, such as multi-story structures, power lines, telecommunication towers, wind turbines, and meteorological towers, should be carefully considered whenever it is near an airport. Areas beneath aircraft traffic patterns, adjacent to a runway, off the runway ends, and even far away from an airport, can prove hazardous sites for tall structures.

All airports receiving aid from the WisDOT Bureau of Aeronautics (BOA) must adopt a Height Limitation Zoning Ordinance (HLZO). State requirements for establishing an HLZO are contained in Wisconsin Law Chapter 114, Subchapter 1 - *Air Transportation*. Such ordinances are declared for the purpose of promoting public safety, welfare, and convenience, and may be adopted, enforced, and administered without the consent of any other governing body. Ordinances typically reflect what is written in the comprehensive plan and are effective tools to reduce incompatible land uses near airports. The FAA also requires aviation hazard removal and mitigation as a condition of accepting federal Airport Improvement Program grants.

In order to comply with these requirements, ensure the safety of aircraft arrivals and departures, and protect for future establishment of instrument approaches to each runway end, the Eau Claire County Board of Supervisors has adopted an HLZO which was last updated in 2007. The County HLZO protects the Airport from incompatible buildings, structures, and objects by establishing height limitations within three miles of the Airport's boundary. The County HLZO map was designed by WisDOT BOA and depicts height limitations by section and subdivision based on FAA design criteria for existing and planned future instrument approaches to Runway 4/22 and Runway 14/32. These limitations must be enforced in order to maintain existing instrument approach procedure decision heights and visibility minimums, and to protect for the lowest possible decision heights and visibility minimums for approaches not yet in place.

As discussed in Chapter 3, Runway 22 is equipped with a CAT-I Instrument Landing System (ILS) and Runway 4 has a Global Positioning System (GPS) approach procedure that provides both horizontal and vertical guidance. The decision heights and visibility minimums for these approaches allow the Airport to be accessible during periods of low visibility and inclement weather. The County HLZO must be enforced in the approaches to Runway 4/22 to ensure that the future accessibility, utility, and safety of the Airport is not compromised.

Runway 14/32 is currently a visual runway, which means it does not have any instrument approach capabilities. However, this runway is eligible for non-precision instrument approach procedures based on the existing facilities and ground equipment currently in place. Chapter 4 of this Master Plan Update

recommends that the Airport plan for implementation of both a non-precision approach and approach procedure with vertical guidance to Runway 14 in the near-term (next five years), and implementation of a non-precision approach to Runway 32 in the medium-term (next five to ten years). Chapter 4 also recommends that the Airport seek to remove existing obstructions and prevent the establishment of new obstructions in the approaches to Runway 14/32 when opportunities arise. This will allow for the best possible future instrument approaches to Runway 14/32, and will enhance the accessibility, utility, and safety of the Airport in general. The County HLZO provides an appropriate vehicle for the Airport to implement this recommendation to the maximum extent possible.

5.4 ENVIRONMENTAL RESOURCES

This section provides an overview of environmental conditions at EAU. This overview identifies environmental resources with particular value which might impose constraints on future Airport development. The purpose of this analysis is to assist in avoidance, minimization, and mitigation of environmental effects associated with proposed Airport projects. The resources discussed in this section may require additional review as part of National Environmental Policy Act (NEPA) documentation processes for these projects.

Environmental resources discussed in this section were determined primarily by researching and analyzing publicly-available literature, information databases, aerial photography, and maps. No field studies were conducted as part of this analysis. Airport staff provided additional information in certain cases, with limited government agency outreach and correspondence. This analysis is not intended to satisfy environmental clearance requirements outlined in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, nor is it intended to fulfill the regulatory requirements of NEPA. NEPA requires that an action involving Federal funding or permit approval must undergo environmental analysis, to evaluate and document proposed effects. An airport project utilizing Federal funds is considered a Federal action and requires NEPA compliance. The following environmental resources are discussed in the following sections:

- Water Resources
- Wetlands
- Biotic Resources
- Cultural Resources
- Farmland
- Hazardous Materials, Solid Waste, and Wastewater

5.4.1. Water Resources

Water bodies in the vicinity of the Airport include the Chippewa River, Lake Hallie, and various ponds and wetlands near the banks of the Chippewa River. The Airport is located outside all floodplains and floodways of the Chippewa River, due to its location on a bluff overlooking the river. Storm water flow direction is highly manipulated at EAU, as at most airports. Stormwater generally flows to the north and west, towards the Chippewa River. The Airport site consists of sandy soils with high infiltration rates. The majority of precipitation and snowmelt at the Airport infiltrates grassed areas on-site that retard runoff and capture suspended solids. However, the Airport also utilizes ditches, swales, holding ponds, wetlands,

infiltration basins, and natural depressions to manage storm water runoff from roadway, runway, and taxiway pavements.

The Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA), provides the authority to establish water quality standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges (section 402) and for dredged or fill material (section 404). The Fish and Wildlife Coordination Act (FWCA) applies to a proposed federal action which would impound, divert, drain, control, or otherwise modify the waters of stream or body of water, unless the project is for the impoundment of water covering an area of less than ten acres. The FWCA requires consultation with the U.S. Fish & Wildlife Service (FWS) and applicable state agencies to identify means to prevent loss and damage to wildlife resources resulting from airport improvements.

The Airport also has a network of culverts, storm water structures, and storm sewers. Surface drainage from future airport development activities is expected to continue to be collected in drainage systems and conveyed to detention basins, to evaporate or percolate into the subsurface. Best management practices should be developed and employed, and construction should incorporate appropriate erosion control measures.

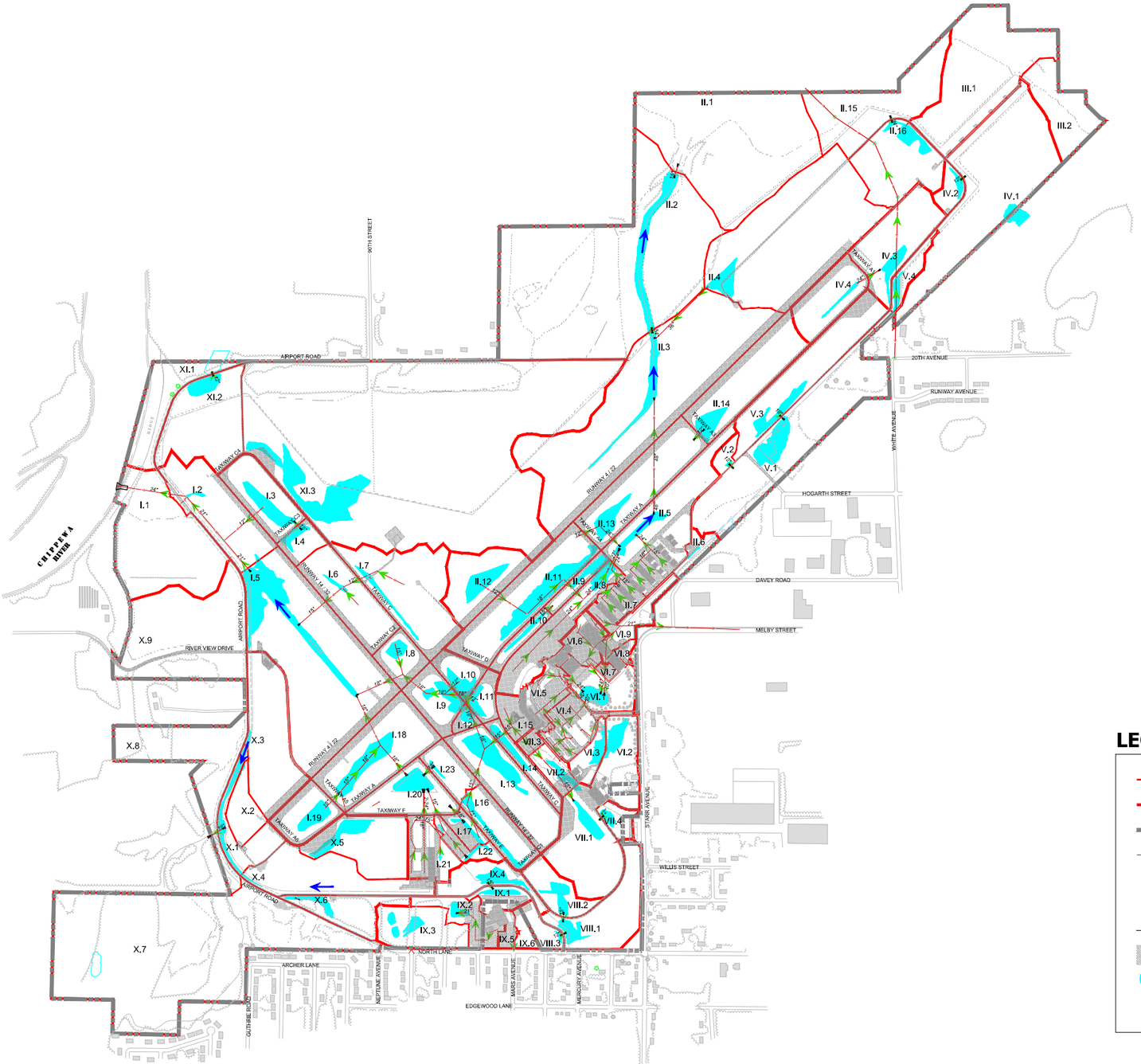
A drainage study was undertaken in 2012 and completed in 2013 to investigate the state of the airport's drainage patterns. This document provides a comprehensive inventory of water resource information relevant to EAU, and best management practices for those resources. The goal of the study was to identify a large-scale storm water management strategy for the site and to introduce this strategy to the regulatory agencies that will use this plan as a guideline when reviewing and commenting on proposed site improvements. To achieve these goals, the following tasks were performed:

- Mapping of the airport drainage network;
- Identification of storm water deficiencies;
- Hydrologic analysis of the airport watersheds;
- Assessment of the current airport drainage system to evaluate its capacity for rainfall events up to the 100-year storm; and
- Modeling of potential improvements to the airport drainage network.

The study area for the drainage study included all Airport-owned property. The Airport property consists of approximately 1,039 acres of land, which was divided into 11 separate watersheds each having its own unique drainage destination. Approximately 13 percent of the airport property is covered by impervious surfaces consisting mainly of buildings and paved areas. The surface water plan developed for the study, which compiles drainage patterns and modeled 100-year high water ponding elevations, is shown in **Figure 5-4**.

FIGURE 5-4

Surface Water Plan



NORTH

0 600' 1,200'

LEGEND

- SUBAREA BOUNDARY
- SUBWATERSHED BOUNDARY
- CVRA PROPERTY LINE
- DRAINAGE PIPE
- DRAINAGE PIPE FLOW DIRECTION
- DITCH FLOW DIRECTION
- FENCE LINE
- IMPERVIOUS SURFACE
- MODELED 100-YEAR PONDING ELEVATION
- X.1 SUBAREA DESIGNATION

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Mead & Hunt

The City of Eau Claire Storm Water Management Ordinance regulates storm water management and erosion control standards, which apply to all land development and land disturbing activities within the City. The City's requirements for runoff volume, infiltration and removal of total suspended solids must be followed. The study proposed various improvements for meeting storm water performance requirements, Proposed improvements include increasing outlet capacity, improving ditches, containing aircraft deicing fluids, removing connections to the City storm sewer, maintaining infiltration basins, and installing basin overflow systems.

A storm water pollution prevention plan (SWPPP) was completed in 2013 for the Airport as required under Part III of Wisconsin Pollutant Discharge Elimination System (WPDES) general permit for storm water discharges and in accordance with good engineering practices. The SWPPP describes the Airport and its operations, identifies potential sources of storm water pollution associated with industrial activities at the facility, recommends appropriate best management practices (BMPs) or pollution control measures to reduce the discharge of pollutants in storm water runoff, and provides for periodic review of the SWPPP.

The SWPPP covers the industrial activities conducted by commercial businesses at CVRA including ground vehicle, aircraft and equipment maintenance, fueling, cleaning, storage, building and grounds maintenance and aircraft deicing. Many smaller privately owned hangars exist at CVRA that are not considered commercial businesses. Therefore, activities conducted in these hangars, such as aircraft maintenance, are not considered industrial related activities and are not included in the SWPPP.

The goal of the storm water permit program is to improve the quality of surface waters by reducing the amount of pollutants potentially contained in the storm water runoff. Industrial facilities subject to industrial storm water must prepare and implement a SWPPP for their facility. The objectives of the SWPPP are to:

- Identify sources of storm water and non-storm water contamination to the storm water drainage system at CVRA;
- Identify and prescribe appropriate "source area control" type best management practices (BMP's) designed to prevent storm water contamination from occurring at CVRA;
- Identify and prescribe "storm water treatment" type BMP's to reduce pollutants in contaminated storm water prior to discharge;
- Prescribe actions needed either to bring non-storm water discharges under WPDES permit or to remove these discharges from the storm drainage system;
- Prescribe and implementation schedule so as to ensure that the storm water management actions prescribed in the SWPPP are carried out and evaluated on a regular basis.

5.4.2. Wetlands

The CWA defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and alternation of wetland functions and values.

Airport development projects implemented over the past decade have not resulted in any impacts to wetlands. A January 2012 review of Wisconsin Department of Natural Resources Wetland Inventory maps indicates there are no mapped wetlands on Airport property, but that soil types and slopes in some areas on Airport property may indicate the presence of wetlands. Wetland delineation studies should be conducted prior to large airport development projects to ensure that there are no impacts to wetlands.

5.4.3. Biotic Resources

The Wisconsin DNR has identified potential wildlife habitats on Airport property, including remnants of original sand prairie, oak and jackpine barrens, and wooded areas. These potential habitats are located largely on the northern portion of Airport property and are mostly outside the Airport perimeter fence. However, the Airport must take proactive measures to ensure that wildlife hazards to aircraft associated with these habitats are minimized to the extent practicable. Such measures may include tree-clearing and wildlife monitoring.

A wildlife hazard assessment (WHA) study was initiated at the Airport in 2012. The WHA will analyze existing and potential wildlife hazards to the safe operations of aircraft at and in the vicinity of the airport. Primary concerns include bird strikes on approach to and departure from the Airport, and control of deer populations in the Airport vicinity. The Airport's wildlife management plan will be updated as part of the WHA study. Although the findings of the WHA are unknown at this time, the Airport's capital improvement program (presented in Chapter 6) should plan for implementing recommendations from the WHA, which may include improved Airport perimeter fencing, clearing and grubbing of vegetated areas, and/or wildlife deterrent systems.

The Wisconsin DNR identified a bald eagle nest in 2000 near the northeastern end of Runway 4/22. For the 2001 Runway 4/22 shift environmental document, the U.S. Fish and Wildlife Service identified the bald eagle (threatened) and the Karner blue butterfly (endangered) as the only two Federally-listed species located in Chippewa County. The FWS stated at that time that these species would not be affected by the runway shift project. Since that time, bald eagles have been removed from the Federal endangered species list and Section 7 consultation with the U.S. Fish and Wildlife Service is no longer necessary. However, the bald eagle remains protected under the Bald and Golden Eagle Protection Act. In 2007, the U.S. FWS also identified the sheepnose mussel and other rare species as being found in the Chippewa River. It has been proposed that the sheepnose mussel and spectaclecase mussel, both found in the Chippewa River, be added to the Federal endangered species list. As a result, any runoff associated with Airport development activities should be carefully controlled to avoid any short- or long-term impacts to the river and its adjacent wetlands.

5.4.4. Cultural Resources

In a review of the Wisconsin Historical Society's Architecture and History Inventory database, it was discovered that only one archaeological site has been previously identified within the vicinity of the Airport. No historic or architectural resources have been previously identified. The Hallie-Larson Site (CH-0015), consisting of an individual concentration of a Late Woodlands campsite, was identified by researchers in 2000. According to the database, the campsite is located approximately 0.65 miles southwest of the Chippewa River, and identified on a map as being just outside the Airport boundary as shown in **Figure 5-5**. The database further notes that the surrounding fields to the north were not examined. The information provided by the Wisconsin Historical Society represents identified cultural resources as of January 2012. Additional historic resources and/or archaeological sites may be located in the vicinity of the Airport. If any future development on Airport property occurs, further historic and archaeological survey may be required.

5.4.5. Farmland

Prime farmland is a designation assigned by the U.S. Department of Agriculture (USDA) defining land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. *Farmland of statewide importance* is land other than prime farmland that is also highly productive, and that approaches productivity of lands in the State which meet prime farmland criteria. These designations help local governments conserve local agricultural resources through zoning, conservation easements, and other farmland preservation techniques.

According to soils data acquired from the USDA Natural Resources Conservation Service (NRCS), Airport property includes no acres of prime farmland, approximately nine acres of prime farmland if drained, and approximately 128 acres of farmland of statewide importance. These areas are presented in **Figure 5-6**. None of these areas are currently in agricultural production, and much of the areas have already been developed for aeronautical use.

If a project involves actual or potential exercise of eminent domain powers to acquire an interest of more than five acres from any farm operation, the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) must complete an Agricultural Impact Statement (AIS). An AIS is an informational and advisory document that describes and analyzes the potential effects of a project on farm operations and agricultural resources. Any projects involving the acquisition of farmland also require coordination with submittal of USDA Farmland Conversion Impact Rating Form AD-1006 in order to follow the guidelines set forth in the Farmland Protection Policy Act (FPPA) of 1984. FPPA is intended to minimize unnecessary and irreversible conversion of farmland to non-agricultural use by federal actions. There are no projects proposed by this Master Plan Update that would require the acquisition of more than five acres from any farm operation.

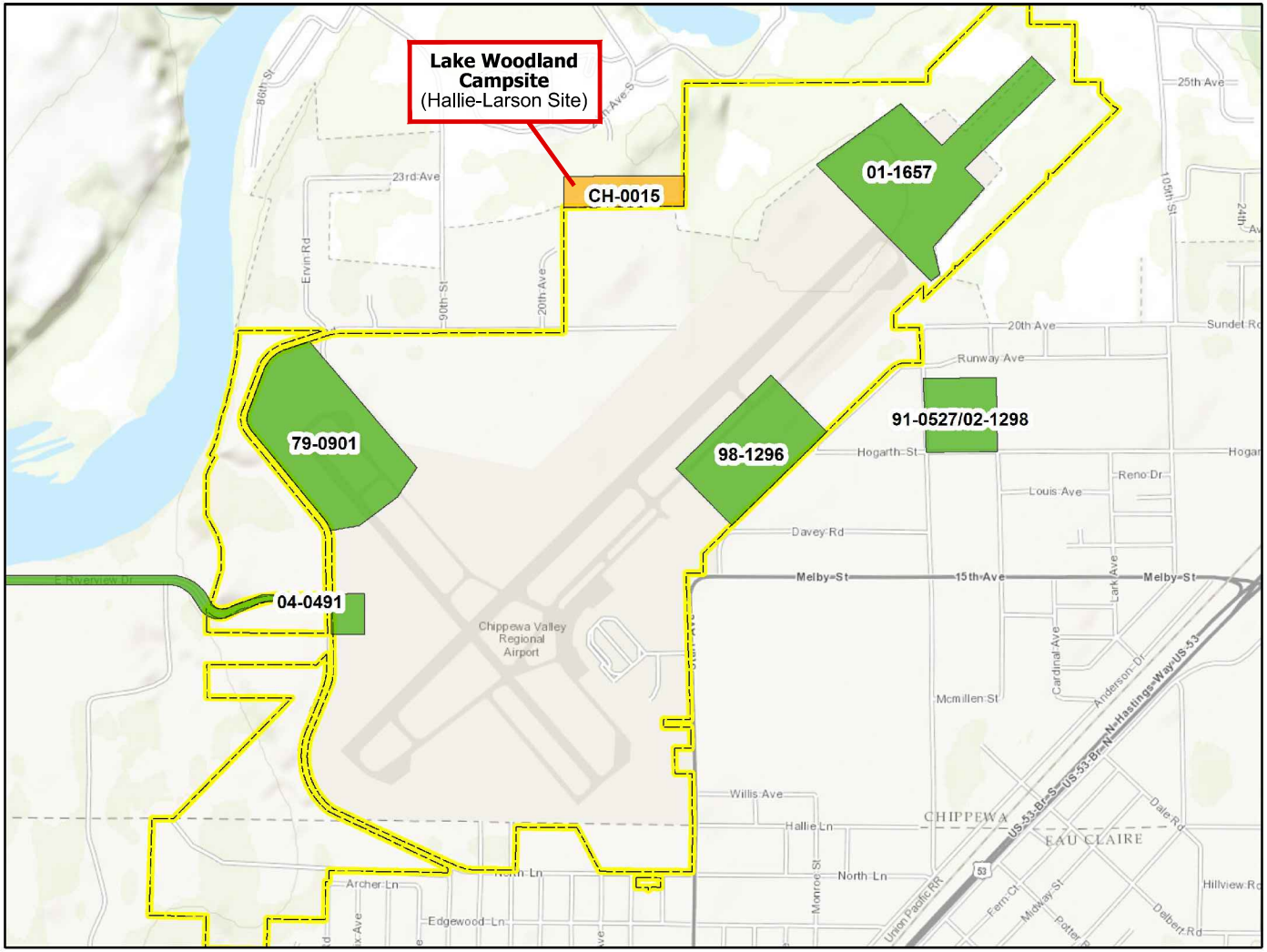


FIGURE 5-5

Cultural Resources

Legend

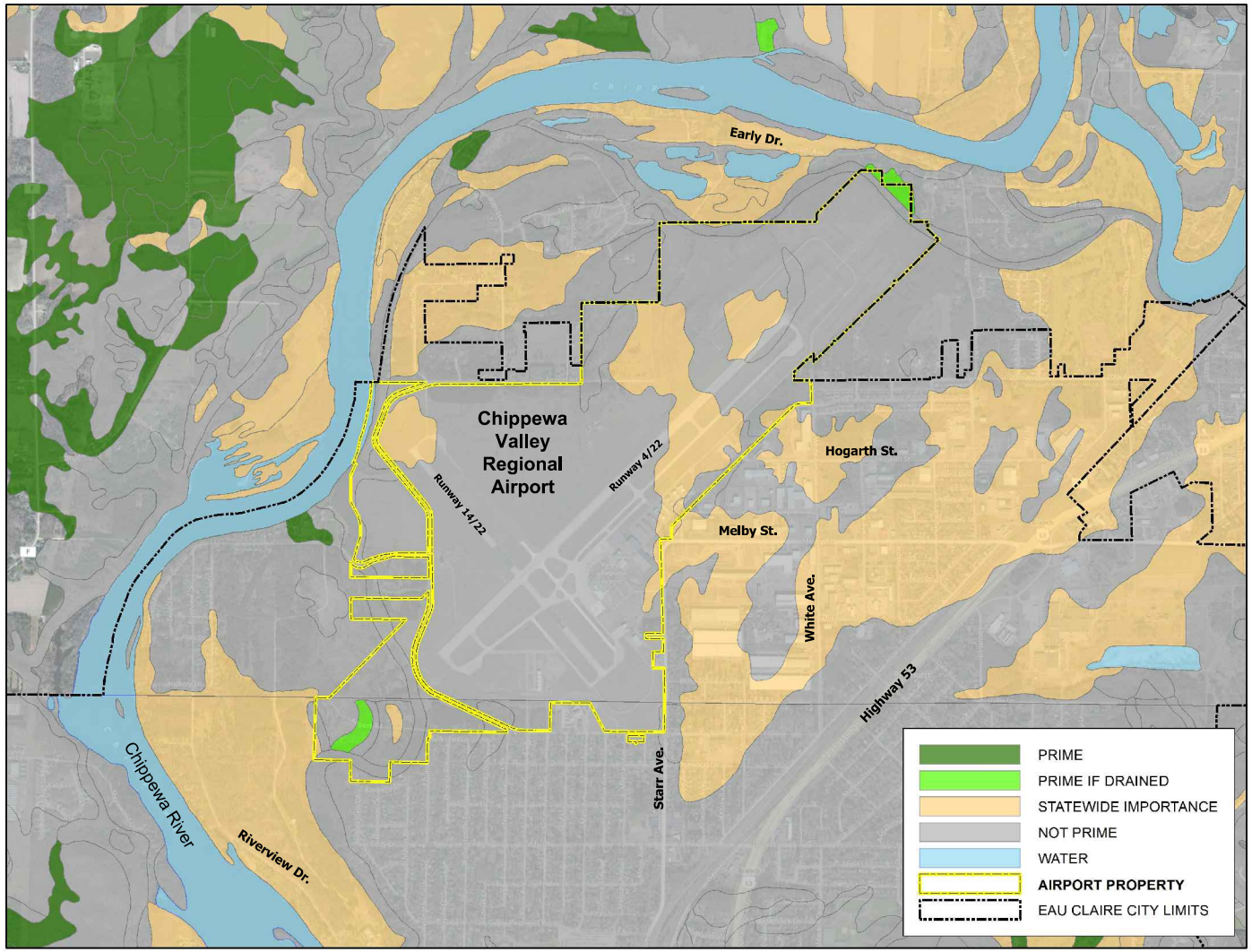
- Previously Identified Archaeological Site
- Previous Archaeological Report

PREPARED BY:

Mead & Hunt

FIGURE 5-6

USDA Soil Designations



NORTH

0 1,000' 2,000'

5.4.6. Hazardous Materials, Solid Waste, and Wastewater

A Phase I Environmental Site Assessment was conducted in 2004 prior to construction of the air traffic control tower. This study identified a site on the National Priorities List to the immediate west of the Airport. This site consists of wells used by the City of Eau Claire to provide drinking water for 45,000 people. Volatile Organic Compounds (VOCs) were detected by the Wisconsin DNR in the early 1980s during routine groundwater sampling. The source of contamination was National Presto Industries, located approximately two miles east of the Airport. VOCs, trichloroethane (TCA), dichloroethane (DCA), and tetrachlorothene (TCE) were listed as the original contaminants of concern and were at the groundwater elevation. The location of the plume was defined and remedial action was implemented at the source. Because this project is almost 30 years old, there has been a decrease in the concentration of groundwater contaminants. As of 2004, the primary contaminant of concern was TCE. Additional hazardous materials site assessments should be conducted prior to implementing larger airport development projects.

The Airport's NPDES permit requires that an inventory be compiled of potential sources of groundwater and stormwater contamination. Significant sources include any material which could degrade or impair water quality. The Airport's SWPPP contains evaluations of each significant source and determines the potential for these materials to be contributed to the runoff being discharged from the facility. Potential contaminants at the Airport are primarily related to aircraft fueling and maintenance and include diesel fuel; unleaded automobile octane level gasoline; 100 Low Lead aviation gas; Jet A aviation fuel; oils, lubricants, and other miscellaneous petroleum products; solvents; Type I and Type IV propylene-glycol based deicing fluids; pesticides; waste oil; solid waste; floor cleaners; and lavatory waste.

The nearest state-licensed solid waste landfill is the Veolia Seven Mile Creek Landfill, located approximately six miles to the east. The nearest wastewater treatment plant is in the City of Chippewa Falls, approximately four miles to the northeast. Due to these distances, there are no hazards associated with solid waste disposal or wastewater treatment land uses in the vicinity of the Airport.

5.4.7. Environmental Resources Summary

EAU is host, neighbor, benefactor, and beneficiary to environmental resources. Airport operations and development can and do occur in balance with the environmental resources on and surrounding the Airport. Airport improvements will require environmental processes and documentation prior to implementation. Consideration and coordination with agencies and regulation prior to Airport development activities will allow EAU to continue to be a good steward of the environment.

5.5 SUSTAINABILITY OPPORTUNITIES

The following sections provide an overview of potential opportunities for improving the overall sustainability of Airport operations and development. A broad, generally-accepted definition of sustainability provided by the United Nations World Commission on Environment and Development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." However, the Sustainable Aviation Guidance Alliance (SAGA) recommends that airport sponsors develop their own definition of sustainability based on "its own unique circumstances and role within its community and environment." As such, SAGA encourages airport sponsors to involve various stakeholders when defining its own approach to sustainable development and operations.

Airport sustainability can encompass a wide variety of practices including facility planning, design, construction, and operations. When done with sustainability in mind, such practices contribute to environmental protection and natural resource conservation; social progress; and stable economic growth and employment. These environmental, social, and economic components of sustainable development practices are often referred to as the triple bottom line of the sustainability concept. Incorporating sustainability practices into Airport operations and development will make the Airport a greater steward of its community and surrounding environment. Sustainability resources and opportunities are discussed in the following sections:

- Sustainability Programs and Resources
- Sustainability Guidelines for Facility Development
- Environmentally Preferable Purchasing
- Solid Waste and Recycling
- Landscaping and Turf Management
- Public Outreach and Education

5.5.1 Sustainability Programs and Resources

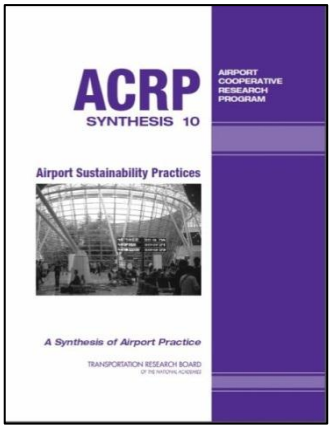
Many programs and resources exist to encourage the implementation of sustainable projects at airports. Examples of these are listed below.

- The National Energy Conservation Policy Act, (NECPA), signed in 2009, recognized that the Federal Government is the single largest energy consumer in the United States, and that the cost of meeting the Federal Government's energy need is substantial. Significant opportunities exist for reducing the energy demand of these facilities by improving operations and maintenance, utilizing modern energy efficient technologies, and employing energy efficient design practices. When evaluated through the use of life-cycle analysis and using private investment capital, many of these measures can be implemented for little or no cost, resulting in a reduction of energy use and associated cost to the Federal Government. This Act established benchmarks for percentage reductions of energy use for Federal buildings from the years 2006-2013, based on consumption per gross square foot for the year 2003.

- The FAA's VALE program, which provides Airport Improvement Program (AIP) funding and expedites the environmental review process for qualified projects that will result in a reduction of aircraft emissions or energy demand at a national level.

- The FAA Reauthorization and Reform Act of 2011 reauthorized FAA operations and programs for the next four years. This Act expanded the eligibility of AIP project costs to those that are justified through life-cycle costs analysis. The Secretary of Transportation is establishing a program to encourage airport sponsors to evaluate energy requirements for vehicles and buildings.

- The Energy Independence & Security Act of 2007 amended NECPA and established performance standards for energy use and reduction in the use of fossil fuels at new Federal buildings and major renovations. This Act established energy saving performance contracts and benchmarks for energy use in these buildings. In addition, Federal buildings will be monitored for energy use, and buildings leased by federal agencies are required to have an Energy Star label.



- Publications by the Transportation Research Board's Airport Cooperative Research Program, including *Airport Sustainability Practices* (Synthesis 10), *Guidebook for Improving Environmental Performance at Small Airports* (02-13) and *Sustainable Airport Construction Practices* (08-01).

- The Sustainable Aviation Guidance Alliance (SAGA) is a coalition of aviation interests formed to assist airport operators in planning, implementing, and maintaining a sustainability program. To this end, SAGA created the *Sustainable Aviation Resource Guide: Planning, Implementing, and Maintaining a Sustainability Program at Airports*. In addition, the SAGA website serves as a central repository for airport sustainability guidelines and documents.

- The State of Wisconsin provides information, resources, and financial incentives for a variety of projects involving cost-effective energy efficiency and renewable energy strategies. Other State and local programs and initiatives can also be enlisted and leveraged to improve the Airport's sustainability profile.

5.5.2 Sustainability Guidelines for Facility Development

This section proposes sustainability guidelines for planning, design, and construction of future facility development projects. These guidelines are based on best practices described in several existing industry standard documents. These documents include Transportation Research Board (TRB) Airports Cooperative Research Program (ACRP) Synthesis Report 10, *Airport Sustainability Practices*; the Chicago Department of Aviation's *Sustainable Airport Manual*; and the Sustainable Aviation Guidance Alliance's (SAGA) *Sustainable Aviation Resource Guide*.

Each facility development project should consider sustainable practices at the planning stage, as facility planning has a profound influence on later stages of design, construction, and operations. Incorporating sustainability at the planning stage provides greater benefits and lowers costs when compared to incorporating sustainability later on during project implementation. Sustainability planning should:

- Flow from an officially-adopted sustainability mission statement;
- Involve key project stakeholders early in the process to discuss and establish sustainability goals and objectives;
- Require sustainability baseline assessments and life-cycle cost/benefit analyses for new or renovated facility projects; and
- Outline steps and strategies for addressing sustainability considerations specific to the project in question.

Life-cycle cost analyses should incorporate both monetary and nonmonetary benefits associated with the proposed development. Nonmonetary benefits may include energy usage and emissions reductions, waste diverted from landfills, water conservation, and improvements in wastewater treatment. Site selection and alternative concept development at the planning stage should consider the overall efficiency and functionality of the Airport layout. Pursuing efficient airport layout options can reduce energy usage and greenhouse gas emissions by reducing aircraft taxi and automobile drive distances, and by incentivizing public transit use. Site selection should also consider protecting natural resources and minimizing wildlife attraction.

Sustainability considerations for design and construction of facility development projects cover a broad range of categories. These categories include water conservation, stormwater management, energy usage, greenhouse gas emissions, soil erosion and sedimentation control, site planning and landscaping, building materials, solid waste management, and energy-efficient building design.

Guideline #1: Water Conservation

Integrated water conservation strategies should be considered for each facility development project. Such strategies may include:

- Low flow or automatic fixtures and toilets;
- Capturing gray water, stormwater, and recycled water for irrigation and car washes;
- "Smart" irrigation systems;
- Green roofs; and
- Water-efficient heating and cooling systems.

Guideline #2: Stormwater Management

Stormwater should be collected, treated, and managed on-site to the greatest extent possible, through the use of various strategies including swales, bioretention, vaults, and natural wetlands. Projects should also seek to reduce the amount of impervious surfaces associated with the facility development, and integrated strategies for preventing hazardous materials spills should be pursued. These strategies should be dictated by specific stormwater pollution prevention plans prepared for each facility development project.

Guideline #3: Soil Erosion and Sedimentation Control

Every facility development project should have an erosion and sedimentation control plan for earthwork management. This plan outlines strategies for preventing loss of soil by stormwater runoff and wind erosion, preventing sedimentation of storm sewers and streams, and preventing air pollution by dust and particulate matter.

Guideline #4: Green Space

Future development projects should incorporate green space as much as possible to reduce Airport heat island effects, control incompatible land uses, provide attractive buffers between Airport facilities and nearby land uses, and generally promote the well-being of employees, Airport users, and the surrounding community. Seeding and landscaping should give preference to native and drought-resistant plantings to reduce irrigation requirements.

Guideline #5: Building Material Reuse and Recycling

Building materials should incorporate reused and recycled materials as much as possible, to reduce consumption of virgin materials and the amount of waste sent to landfills. In particular, demolished concrete and asphalt should be reused during construction of future developments. Recycling strategies should be developed for waste and scrap materials resulting from construction projects. The Construction Waste Management Database provided by the Whole Building Design Guide (www.wbdg.org/tools/cwm.php) should be used to identify resources for salvaged or surplus materials for reuse.

Guideline #6: Indigenous Materials

Building materials should also incorporate indigenous materials that are extracted, harvested, or manufactured within the Airport's community. Use of indigenous materials supports the local economy and community, and reduces energy consumption and greenhouse gas emissions associated with material shipments. Local contractors should also be hired as much as possible for similar reasons. Preference should be given to local environmentally-friendly building materials and businesses.

Guideline #7: Energy-Efficient Building Design

In the past, producing an energy-efficient project has typically been voluntary, but it is becoming increasingly common that a certain level of energy-efficiency in a project is required by federal, state, or local regulations. This not only benefits communities and the environment, it also makes good business sense, since an energy-efficient facility will have reduced utility expenses and operation costs. An example of energy-efficiency is to use lighting that requires less electricity than conventional lighting. In a

building project, other examples include managing energy use in the building systems and controlling heat gain or loss through the walls, windows, doors, floors and roofs.

The Airport should consider design elements related to Net Zero Energy building designs that produce at least as much renewable energy in a year as they use in non-renewable energy. The goal of the U.S. Department of Energy is to have all newly constructed buildings achieve Net Zero Energy status by 2030. This can be accomplished using some or all of the following:

- Solar photovoltaic (PV) panel systems on south facing roofs, or free-standing solar PV panel arrays;
- Geothermal heating and cooling systems;
- High standards of wall and roof insulation and high performance glazing;
- Maximized use of natural light through daylighting, site orientation, and building design;
- Energy Star energy-efficient equipment and appliances;
- High efficiency light bulbs controlled by automatic sensors;
- Natural ventilation systems that provide air change and night flushing, as well as improved indoor air quality; and
- Intelligent building automation systems that control temperature, humidity, lighting, and natural ventilation.

These energy efficiency strategies can also be used to achieve the highest practical certification for each development project under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) system.

5.5.3 Geothermal Payback Analysis Summary

In 2008, a Geothermal Payback Analysis was conducted for Chippewa Valley Regional Airport. This report examined the economic feasibility of a geothermal heat pump system for the passenger terminal building compared with a conventional variable air volume system. The analysis was based on cost effectiveness corresponding to energy efficiency, maintenance and reliability, life cycle cost, and environmental stewardship.

The Analysis revealed that initial construction of a geothermal heat pump system would cost approximately $355,000 more than a conventional chiller/boiler hot water reheat system. However, lower consumption and demand costs associated with the geothermal system over the span of 25 years would result in a savings of approximately $663,000.

The Geothermal Payback Analysis recommended that the existing terminal building be retrofitted to accommodate geothermal heat pumps. The report also cites that the initial installation costs of the geothermal system would be recovered through lower operation and maintenance costs in approximately 9.3 years based on a life cycle cost basis and 9.6 years on a simple payback basis.

It should be noted that since completion of the Geothermal Payback Analysis, auto parking and circulation has been altered and expanded. These improvements would likely result in the identification of an alternate bore field location than the one described in the original Analysis.

5.5.4 Environmentally Preferable Purchasing

The U.S. Environmental Protection Agency (EPA) provides guidance and educational resources to local governments that wish to develop an Environmentally Preferable Purchasing (EPP) Program [see the EPA EPP website (www.epa.gov/epp/index.htm) to find and evaluate green products and services]. Environmentally preferable means "products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose," according to Executive Order 13101, *Greening the Government through Waste Prevention, Recycling and Federal Acquisition*. This comparison applies to raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance, and disposal. Environmentally preferable products include bio-based products, energy-efficient products, recycled-content products, safer chemical products, and water-efficient products.

Benefits of an EPP include improved ability to meet environmental goals, improved worker safety and health, reduced liabilities, reduced health and disposal costs, and increased availability of environmentally preferable products in the marketplace. In other words, preferability can and should be demonstrated at many stages of the product's life-cycle. Preferability is a function of the local conditions in which the products are used, and is comparative, not absolute. EPA recommends that purchasers select products that maximize beneficial environmental attributes and minimize adverse environmental effects without compromising the traditional price and performance considerations that influence every purchasing decision.

5.5.5 Solid Waste and Recycling

Numerous opportunities exist for reducing landfill-bound solid waste originating at the Airport. The Airport should use the following list of potential solid waste and recycling strategies to identify waste reduction opportunities in all aspects of Airport operations. Many of these strategies may already be in use.

- Recycle aluminum, glass, plastics, paper, newspaper, magazines, phone books, and cardboard.
- Recycle batteries, light bulbs, toner cartridges, and electronics.
- Provide free recycling services to tenants and/or assist tenants with setting up their own recycling programs.
- Provide recycling containers in the terminal for passenger use.
- Separate food waste from normal waste to utilize for off-site composting, biofuels, livestock feed, or other uses. Develop and implement public food waste collection stations.
- Use reusable mugs, glasses, and water bottles instead of paper or Styrofoam.
- Provide liquid collection stations, especially at security checkpoints where full beverage bottles and other liquids are disposed of, to minimize landfill-bound waste.
- Install hydration stations after security checkpoints so passengers can refill beverage containers after dumping out liquids to pass through security.
- Use biodegradable plates and cutlery.
- Recycle coffee grounds as mulch (grounds create a rich, dark compost that helps replace soil acids needed to keep plants healthy).
- Incentivize concessionaires and tenants to minimize packaging, and to use reusable bags, biodegradable bags, and/or paper bags rather than plastic bags.

- Conduct a waste composition study (waste stream audit) to identify the most common types and amount of waste collected.
- Work with tenants and contractors to provide recycling data and establish monitoring and reporting techniques.
- Provide educational training to staff, tenants, and public on waste reduction.
- Provide containers to GA pilots for collection of waste engine oil for reuse by outside contractors on various construction projects.
- Recycle aircraft tires, turbine oil, skydrol, engine oil, carpet, glass and metal from light bulbs, and aircraft batteries.
- Recycle gas and oil filters, waste gasoline, motor oil, antifreeze, scrap metal, tires, electrical wiring, electronics, deicing fluid, grease and sludge, hazardous materials and spent solvents, pallets, and wood.

5.5.6 Landscaping and Turf Management

Sustainable landscaping and turf management strategies can reduce stormwater runoff; reduce the need for fertilizer, pesticide, and herbicide applications; and increase re-use of organic materials on-site. The following landscaping and turf management strategies should be considered in both day-to-day operations and new Airport development projects.

- Perform a soil and climate analysis to determine the appropriate landscape strategy.
- Substitute vegetated surfaces for impervious surfaces wherever possible.
- Increase plant shade and use mulching and composting around plant root zones to increase water retention.
- Plant drought-resistant vegetation that does not attract wildlife and does not require regular pesticide applications.
- Segregate drought-resistant vegetation from conventional and ornamental vegetation.
- Specify non-toxic, non-chemical materials for initial landscape planting and fertilization.
- Minimize disturbed landscape areas and keep pre-existing vegetation intact whenever feasible.
- Chip or compost all vegetation for re-use on site and replant disturbed vegetation.
- Incorporate temporary and permanent soil stabilization techniques, including compost, hydraulic mulch, hydroseeding, soil binders, straw mulch, and wood mulch.
- Green roofs for the terminal and other Airport buildings.

5.5.7 Public Outreach and Education

Engaging and educating the general public about Airport benefits and sustainability initiatives can improve community sustainability by integrating Airport efforts with other local initiatives. The following strategies can be used to improve public outreach and identify new opportunities for sustainable initiatives.

- Coordinate sustainability strategies with other local organizations.
- Use the Airport website to detail existing and future sustainability practices and provide opportunity for community input.
- Provide sustainability information kiosks in the Airport terminal.

- Establish working relationships with local, regional, and/or national environmental organizations.
- Partner with local environmental or conservation groups to fund restoration of nearby areas.
- Partner with universities and research centers to evaluate, demonstrate, and commercialize new airport sustainability technologies.
- Partner with community groups and local businesses.
- Offer and manage volunteer programs where students, retirees, and/or aviation enthusiasts can tour/learn about the airport and can assist with landscaping tasks, discuss sustainability with passengers, aid vendors, showcase the city, inform tourists, etc.
- Coordinate with local schools to arrange for field trips or presentations for education on airport and aviation-related issues.

5.6 CONCLUSION

This section summarizes the findings and recommendations of this Environmental and Land Use Plan for the Chippewa Valley Regional Airport, as follows:

- The Airport currently has sufficient property interest over all of its runway protection zones (RPZs) to protect against the future development of incompatible land uses. The Airport should be cautious when considering airfield changes or new land uses that will affect its RPZs.
- The County airport zoning ordinance has been used as a model ordinance by WisDOT Bureau of Aeronautics, which allows the County to exercise sufficient control over neighboring land uses. Modifications to the airport zoning ordinance should be considered whenever there are proposals for airport expansion or significant changes to aircraft operating procedures in the vicinity of the Airport.
- Building construction requirements contained in the airport zoning ordinance provide adequate mitigation for concerns associated with existing and anticipated future day-night average noise levels at the Airport. The Airport should seek to minimize potential future noise impacts by enhancing operator awareness of noise-sensitive land uses surrounding the Airport, and reducing the frequency of aircraft run-ups during nighttime hours, if possible.
- The County should consider revising its airport zoning ordinance to include a new “Airport Business” zone that allows for more streamlined approval of compatible commercial and industrial land uses on specific portions of Airport property.
- To eliminate confusion between City and County zoning ordinances, the City of Eau Claire should officially incorporate a Zone A into its zoning ordinance that is identical to the Zone A adopted by the County, and to rescind Zone P on Airport property.
- Future Airport improvements will require environmental processes and documentation prior to implementation. Consideration and coordination with agencies and regulation prior to Airport development activities will allow EAU to continue to be a good steward of the environment. This Chapter provides an overview of high-profile environmental resources on and surrounding the Airport that should be considered during the scoping process for environmental review projects.
- Incorporating sustainability practices into Airport operations and development will make the Airport a greater steward of its community and surrounding environment. This Chapter provides a range of suggested opportunities for improving the long-term sustainability of the Airport.