CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3 describes the existing social, economic, and environmental conditions in the Study Area, which serve as a baseline for comparing the potential impacts of the route, type of service, frequency of service, and station stops carried forward for detailed analysis in this Tier 1 EIS. Chapter 3 also identifies potential environmental consequences that would result from implementation of the Project as well as mitigation measures that could be used to avoid or minimize some of those potential environmental consequences.

The methodology for conducting the review and evaluation of the social, economic, and environmental resources is in accordance with federal regulations and guidelines, including NEPA (42 USC 4321-4347); FRA's Procedures for Considering Environmental Impacts (Environmental Procedures) (64 FR 28545); and guidelines published by the Council on Environmental Quality (CEQ) on implementing NEPA (40 CFR 1500).

The Study Area for the Build Alternative is approximately 500 miles long from Chicago, Illinois, through Iowa, to Omaha, Nebraska, and 500 feet wide on each side of the existing rail centerline for a total width of 1,000 feet. The Study Area was reviewed using recent aerial and satellite high-resolution photographic imagery; maps of topography, hydrography, and other features; and the most recent geographic information system (GIS) data for a variety of environmental resources. Because of the length of the Corridor and because this is a Tier 1 analysis, field visits for resource review were not conducted.

The existing railroad ROW along the Corridor was assumed to be 100 feet wide; although the actual ROW varies, this assumption was determined to represent a reasonable average width. A buffer was then applied to accommodate additional track needs to promote efficient track maintenance and reduce operating disruptions. The existing ROW and estimated additional ROW that would be necessary for track and siding construction and improvements at station locations constitutes the Potential Impact Area. The anticipated amount of additional ROW required was conservatively estimated to allow for future design and to accommodate design constraints. Because there are multiple potential station locations in Council Bluffs, Iowa, and Omaha, Nebraska, and multiple design options through East Des Moines, Iowa, and across the Missouri River between Council Bluffs and Omaha, there is more than one potential alignment currently under consideration in those areas. During Tier 2 analyses, one alignment would be selected. For analysis in this Tier 1 EIS, the area along all alignments under consideration was evaluated as if it would be impacted. Consequently, the Potential Impact Area overestimates the area that would be directly impacted by Project construction to account for estimated ROW needs and multiple potential alignments in particular areas.

The No-Build Alternative would not involve construction and operation of intercity passenger rail service from Chicago to Omaha, but would include other programmed transportation improvements (identified in Section 2.2.1). This includes independently planned construction of passenger rail service from Chicago to Moline, with subsequent operation of two round-trips per day at speeds up to 79 mph. This project is referred to as the

Chicago to Quad Cities Expansion Program and is being evaluated in Tier 2 NEPA analyses on three separate projects: Chicago to Wyanet, Illinois; the Wyanet Connection of BNSF and IAIS track; and Wyanet to Moline, Illinois. Two of the areas of potential concern for environmental impacts from construction of the Chicago to Quad Cities Expansion Program are Eola Yard in Eola, Illinois, and Wyanet; these areas will be addressed for potential impacts for most resources assessed in this EIS. Construction for the Chicago to Quad Cities service is anticipated to commence in 2013 and the service to be operational by 2015.

The Chicago to Quad Cities Expansion Program passenger rail project would affect a portion of the same rail corridor as the Chicago to Omaha Project. Consequently, the impacts associated with construction of the Chicago to Council Bluffs-Omaha Project between Chicago and Moline would actually be less than estimated for this analysis. Operational impacts for two round-trips per day associated with the Chicago to Quad Cities service were considered in this analysis.

In this Tier 1 EIS, the following general outline is used to summarize the analysis conducted for each resource. With the exception of costal zone management, all resources identified in FRA's Environmental Procedures have been assessed. Coastal zone management was not evaluated because the Study Area does not include any coastal zones.

- **Methodology and Regulatory Requirements** – Summarizes the impact analysis methodology and the regulatory requirements for each resource, including the sources for the data collected and the applicable government agencies involved in the regulation of each resource.
- **Affected Environment** – Describes the existing social, economic, or environmental conditions for each resource and their general locations within the Study Area.
- **Impacts of No-Build Alternative** – Evaluates the potential impacts of the No-Build Alternative.
- **Impacts of Build Alternative** – Evaluates the potential impacts of the Build Alternative as it is proposed to be fully implemented, but also addresses potential impacts of phased implementation.
- **Potential Mitigation Measures** – Reviews potential mitigation measures, including avoidance and minimization, appropriate for the Tier 1 EIS. Specific mitigation measures would not be identified until preparation of Tier 2 NEPA documents.

The assessment of impacts focuses on the Potential Impact Area and are quantified for many resources, but are evaluated qualitatively for some resources. For example, land use data were not available at the same level of detail throughout the approximately 500-mile-long corridor. Consequently, land use impacts are addressed qualitatively, with specific information on a few locations where it is known that additional ROW would be required and affect land use. Also, some resources, such as air quality and cultural resources, use different areas to evaluate potential impacts. The individual resource sections describe the area reviewed and discuss whether impacts are evaluated quantitatively or qualitatively. Impacts of phased implementation are addressed qualitatively in this Tier 1 EIS.

Appendix B contains figures showing the Study Area and Potential Impact Area as well as resources present within 0.5 mile of the rail corridor. Depending on the view of the figure and various database information, some resources are also shown outside 0.5 mile of the rail corridor. The figures were derived using recent aerial and satellite high-resolution photographic imagery, and the most recent GIS data for a variety of environmental resources. Resource data were not digitized for this Tier 1 analysis.

3.1 TRANSPORTATION

The transportation analysis includes considerations of all passenger and freight transportation modes (that is, automobile, air, bus, and rail) of the regional transportation network.

3.1.1 Methodology and Regulatory Requirements

Transportation considerations are evaluated in accordance with FRA's Environmental Procedures.

Coordination has taken place with Illinois DOT, Iowa DOT, Nebraska Department of Roads (NDOR), regional Metropolitan Planning Organizations (MPOs), and Councils of Government (COGs) to obtain readily available long-range transportation plans, including information related to air travel, along the Corridor. Major existing and planned transportation facilities for each transportation mode along the Corridor have been identified, including existing locations with substantial levels of congestion. Information regarding vehicle miles traveled (VMT) and average daily traffic (ADT) volumes for major highways in the Corridor have been collected from Illinois DOT, Iowa DOT, and NDOR. Information regarding intercity bus and passenger rail service has been collected from MPOs, COGs, and appropriate state long-range transportation plans. As appropriate, local transit services have been identified along the Build Alternative, particularly at potential station locations.

3.1.2 Affected Environment

The existing transportation network, including any nearby airports, along the Corridor is shown in Appendix B, Figures 1 through 162. Total trips in 2020 by travel mode along the Corridor is provided in Table 3.1-1. These numbers reflect the 2020 base modal split accounting for the proposed improvements to passenger rail service between Chicago and Moline as part of the Chicago to Quad Cities Expansion Program.

Table 3.1-1. Total Trips by Mode for the Year 2020

Mode of Travel	Total Trips[a]	Percent of Total
Automobile	72,883,000	97.7%
Air	1,233,000	1.7%
Bus	359,000	0.4%
Passenger Rail	113,000	0.2%
Total	**74,588,000**	**100%**

Source: AECOM Ridership, Diversion, and Modal Split Forecast for Year 2020

Note:

[a] *Excludes short trips of less than 100 miles.*

3.1.2.1 Automobile Travel via the Interstate and Highway Network

In 2020, without new passenger rail service, approximately 98 percent of all travel between Chicago and Omaha is estimated to be by personal automobile. The primary travel route is I-88 between Chicago and East Moline, approximately 160 miles, and I-80 between East Moline and Downtown Omaha, approximately 313 miles. From southern Chicago, the entire route along I-80 from Chicago to Omaha is approximately 470 miles. A one-way trip by automobile between Chicago and Omaha along either of these routes at posted interstate speeds takes approximately eight hours.

As noted in the Iowa 2012 long-range transportation plan, *Iowa in Motion – Planning Ahead 2040*, VMT on Iowa highways is expected to continue to steadily increase. If capacity or other improvements are not made, congestion along I-80 and Iowa highways will continue. Within urban sections in the Quad Cities, Iowa City, Des Moines, and Council Bluffs, where traffic congestion is the greatest, there is limited ROW to expand due to existing development. Furthermore, according to the Iowa long-range transportation plan, freight truck traffic is expected to increase by 62 percent through 2040 on major highway corridors, with a substantial amount of this traffic on I-80, creating additional conflicts with vehicular traffic and further contributing to congestion. The Illinois *2012 Long Range Transportation Plan – Transforming Transportation for Tomorrow* is currently in development and is scheduled to be completed in December 2012. However, the existing Illinois long-range transportation plan that was updated in December 2007 indicates a continued steady increase in VMT, an increase of 39 percent by 2030. The Nebraska 2012 long-range transportation plan, *Vision 2032*, noted a 102 percent VMT increase by the year 2030 for the Omaha/Council Bluffs metropolitan area.

3.1.2.2 Air Service

Air service is currently available between major cities in the Study Area. Commercial air service is provided in Chicago (Chicago O'Hare International Airport and Chicago Midway International Airport), Moline (Quad Cities International Airport), Des Moines (Des Moines International Airport), and Omaha (Eppley Airfield). Direct flight service between Chicago and Omaha is served by American Airlines, Southwest Airlines, United Airlines, and U.S. Airways. Typical flight times range from 1 hour and 20 minutes to 1 hour and 40 minutes. Direct flight service between Chicago and Des Moines is served by American Airlines, Southwest Airlines, United Airlines, and U.S. Airways. Typical flight times range from 1 hour and 15 minutes to 1 hour and 25 minutes. Direct flight service between Chicago and the Quad Cities is also served by American Airlines, United Airlines, and U.S. Airways. Typical flight times range from 52 minutes to 56 minutes. There is no direct service between Moline and Omaha or between Des Moines and Omaha; typical connections go through Chicago or Minneapolis.

3.1.2.3 Bus Service

Bus service is provided in a majority of mid-to-large sized cities, with intermittent service in smaller towns. Service between Chicago and Omaha, with multiple stops, was provided by Greyhound. On August 15, 2012, Burlington Trailways took over the Greyhound routes from Omaha (though Greyhound is still maintaining the terminals), including the route from Omaha to Chicago, which features stops in Des Moines, Iowa City, Davenport, and Moline.

Typical bus service includes two trips per day: one in the early morning and one in the late evening. Typical travel time by bus between Chicago and Omaha ranges from 9 hours and 15 minutes for "Express" service to 9 hours and 40 minutes for regular service (Greyhound, 2011).

Megabus.com, a subsidiary of Coach USA, is a low-fare express bus service that recently added daily service between Chicago and Omaha with stops in Iowa City and Des Moines. Megbus.com provides two round-trips per day: one in the morning and one in the late evening. The full one-way trip from Chicago to Omaha takes 8 hours and 50 minutes. In addition to low fares, Megabus.com offers competitive amenities including Wi-Fi service, power ports at each seat, and on-board restrooms. However, Megabus.com does not always provide traditional sheltered station stops. In Chicago, the station stop is located adjacent to Union Station. In Omaha, the station stop is adjacent to the parking garage at Crossroads Mall (Megabus.com, 2012).

3.1.2.4 Passenger Rail Service

Current passenger rail service between Chicago and Omaha (the route is shown in Figure 2-2) is part of Amtrak's national or long-distance service on the *California Zephyr*, which terminates in Oakland, California. The *California Zephyr* serves four stops in Illinois, five stops in Iowa, and one stop in Nebraska along the BNSF line: Chicago, Naperville, Princeton, and Galesburg, Illinois; Burlington, Mt. Pleasant, Ottumwa, Osceola, and Creston, Iowa; and Omaha, Nebraska. Travel time from Chicago to Omaha on the current Amtrak long-distance service is approximately 8 hours and 55 minutes while travel time from Omaha to Chicago is approximately 9 hours and 36 minutes, compared to approximately 8 hours for travel by automobile (Amtrak, 2012). Arrival and departure times in Omaha are typically late at night or early in the morning. Other intercity passenger rail services currently operate within or adjacent to a portion of the Corridor in Illinois, including Amtrak's *Southwest Chief* (Chicago to Fort Madison, Iowa, at the Illinois/Iowa border) and Illinois' state-supported, Amtrak-operated *Illinois Zephyr* and *Carl Sandburg* services operating between Chicago and Quincy, Illinois. The Metra fixed-route commuter rail service currently operates on the BNSF rail corridor between downtown Chicago and Aurora, providing passenger rail service generally from 4:30 am through 2:00 am.

3.1.2.5 Freight Rail Service

The BNSF line in Illinois and the IAIS rail line in Iowa are located within the Corridor. BNSF is a high-volume Class I carrier with mostly double track sections. Within the Corridor, the BNSF line carries a traffic density of 40 to 59.9 million gross tons per mile per year (MGT) (North American Railroad Map, 2010). IAIS is a small volume Class II carrier with mostly single track sections. Within the Corridor, the IAIS line carries a traffic density of less than 1 MGT (North American Railroad Map, 2010). The main commodities handled by BNSF in the Corridor are coal, food products, chemicals, and fertilizers. The main commodities handled by IAIS in the Corridor are farm products, food products, waste, scrap products, lumber, and chemicals/fertilizers.

3.1.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on transportation are not anticipated beyond those that could occur due to other projects. Travel originating in the Corridor west of Moline, Illinois, would continue to use predominantly automobiles and buses along I-80 and the Iowa highway network. Other intercity passenger rail services that currently operate within or adjacent to the Chicago to Omaha Corridor, including Amtrak's *California Zephyr* and *Southwest Chief*, and Illinois' state-supported, Amtrak-operated *Illinois Zephyr* and *Carl Sandburg* services, are assumed to continue to operate. Congestion would continue to increase along I-80 and I-88, resulting in more travel delays and increased conflicts with truck freight traffic. Negative impacts of congestion include lost opportunity costs for motorists, wasted fuel consumption, raised travel costs, increased air pollution, delays for emergency vehicles and increased traffic on parallel road networks. There could also be more delays at at-grade railroad crossings because of more vehicular traffic.

3.1.4 Impacts of Build Alternative

Within portions of the Study Area with single track, a parallel track would need to be installed to minimize delays and interference with existing freight rail traffic. In addition to new track or upgrades to existing track, other improvements associated with new passenger rail service would include upgrades to existing crossings and signals. All of these improvements would indirectly benefit existing freight rail service within the Potential Impact Area.

The Build Alternative would provide new passenger rail service between Chicago and Omaha. New high-speed passenger rail service within the Study Area would share the rail infrastructure with existing freight rail operations on both BNSF and IAIS rail line tracks. Other intercity passenger rail services that currently operate within or adjacent to the Chicago to Omaha Corridor are assumed to continue to operate. Potential impacts of this new service would be conflicts with existing passenger rail service along a portion of the BNSF line and freight rail service along both lines. This potential conflict would be minimized through safety upgrades and capacity improvements along both lines and the likely construction of a second rail along the IAIS line.

Under the Build Alternative, estimated average travel times between Chicago and Omaha would be under 7 hours. Between Chicago and Des Moines, the estimated average travel time would be under 5 hours. The Build Alternative would provide both standard-stop and selected-stop services. Travel demand and diversion forecasts for this alternative were performed and may be seen in Table 3.1-2. A large percentage of the trips are due to diversion from auto, bus and air trips. Approximately 71 percent of the passengers are diverted from autos, 17 percent from bus service and 2 percent from air service. The Build Alternate would also generate an induced demand, estimated to be approximately 10 percent.

The operation of this new passenger rail service could potentially impact local traffic patterns at the station locations. Traffic volumes as well as parking demand would increase. Details on the impact to the local road network and parking facilities would be discussed in the Tier 2 NEPA analyses.

Table 3.1-2. Total Rail Ridership by Diverted Travel Mode

Travel Mode	Estimated Diversions for the Build Alternative (passengers per year)
Automobile	919,500
Bus	218,500
Air	27,500
Induced Demand	128,500
Total	1,294,000

Source: AECOM Ridership, Diversion, and Modal Split Forecast for Year 2020

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speed of the passenger trains would cause less temporary construction impacts to the transportation system than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to the transportation system would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts and benefits to the traveling public would occur.

3.1.5 Potential Mitigation Measures

To reduce impacts on other transportation modes, the Project would include safety and capacity improvements. These potential improvements include double tracking and signal upgrades to address safety concerns at intersections and to limit disruption of existing freight rail service. These improvements are described in detail in Section 3.7, Public Health and Safety. Specific mitigation measures, to the extent required, will be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.2 LAND USE, ZONING, AND PROPERTY ACQUISITIONS

The assessment of land use, zoning, and property acquisitions includes consideration of the Project's impact on existing and future land uses, public zoning policy, and potential areas of property acquisitions and/or relocations where additional ROW may be required.

3.2.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to relocations of residents and businesses is the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Civil Rights Act of 1964.

Due to the length of the Study Area, land use data collection was limited to available statewide satellite land cover data in GIS format and was supplemented by aerial and satellite photography. Relevant land use plans in a usable GIS format and public zoning data were

collected from regional MPOs and COGs for potential station locations only and will be reviewed more thoroughly in the Tier 2 analysis. Generalized land use data were separated into agricultural, rural-undeveloped, rural-residential, and urban-developed categories.

3.2.2 Affected Environment

An aerial view of the Corridor is shown in Appendix B, Figures 1 through 162. Different land uses are readily identifiable in the figures, which include the Study Area and adjacent land. The Study Area traverses three states, 24 counties, and 82 urban areas over approximately 500 miles. Throughout the Study Area, there is a wide diversity of land use types, patterns, and densities. Within urban areas, the predominant land use types are industrial and commercial, and to a lesser extent, established urban and suburban residential. Within rural areas, the predominant land use type is agricultural, with a few scattered rural residences. Because rural areas contain cropland or open areas, they are considered to have fewer sensitive land uses than urban areas.

The eastern terminus of the Study Area includes the urban-industrialized areas of Chicago as well as its suburban cities and exurban bedroom communities. The predominate land uses in these areas are urban-industrial, commercial, and to a lesser extent, established urban and suburan residential areas. These land uses are long-established and are adjacent to existing high-volume passenger and freight rail lines.

The central portion of the Study Area consists of rural-agricultural communities (population less than 10,000), rural economic centers (population 10,000 to 50,000), and mid-to-large cities (population of 50,000 to 200,000+) within Illinois and Iowa. The majority of the rural-agricultural communites in the Study Area have stagnant to declining populations. In the past, the agricultural industry served as the main economic base for many of these communities; however, as the agriculture industry has become more efficient and less labor intensive, some of the population began to shift to larger cities or other industries including health care, education, and to a lesser extent, small manufacturing and retail. Rural economic centers are largely residential; however, they do include support retail and services for smaller rural/agricultural communites within the area. Land uses within these areas are rural-agricultural with a few scattered rural residences. Within rural economic centers, there are a few commercial and service uses with modest concentrations of residential.

Mid-to-large cities include cities or groups of cities serving the center of a larger metropolian area. The Quad Cities are a group of five mid-sized cities (East Moline, Moline, and Rock Island, Illinois, and Davenport and Bettendorf, Iowa) that collectively serve as a major economic center on the western Illinois/eastern Iowa Mississippi River border. Historically, the Quad Cities' dominant economic sectors were manufacturting and support industries; however, over the past 30 years, the economies of these cities have become more diverse with the revitilizaton of downtown and older industrial areas. The existing land uses in these communities within the Study Area are primarily industrial. However, within and adjacent to downtown areas, there are established commercial, office, and residential neighborhoods.

The western terminus of the Study Area includes the Omaha/Council Bluffs metropolitan area. Land uses are predominately industrial, with office, commercial, and parkland near downtown Omaha and industrial and commercial areas near I-80 in central Omaha.

3.2.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on existing land uses and zoning are not anticipated beyond those that could occur due to other projects. The need for ROW in support of the Chicago to Quad Cities service would result in a minimal change in land use based on the potential amount of land required adjacent to existing ROW. The majority of the ROW would need to be acquired for construction of the Wyanet Connection to join BNSF and IAIS track near Wyanet, Illinois.

3.2.4 Impacts of Build Alternative

For the Build Alternative, a majority of main line improvements would occur within or close to existing ROW, with few direct impacts on adjacent land uses. The land would be converted from its current condition to a railroad grade, and track would be constructed. Likely land use impacts would include potential acquisition of additional ROW for improvements around identified station areas. Two locations where new ROW would be required that would impact existing land uses are the following:

1. The Build Alternative may require further improvement of the Wyanet Connection (approximately 1 mile south of Wyanet, Illinois) to facilitate two additional round-trips per day at speeds up to 110 mph. This area is shown in Appendix B, Figures 38 and 39. Consequently, more ROW, with farmland and other land use conversion, would potentially be required for the Build Alternative at this location.
2. The Build Alternative includes a southern alignment option through southern Des Moines, Iowa, (Des Moines Design Option 3) that would require substantial property acquision for a new alignment. Although this area is industrial in character, sensitive land uses that would be directly impacted include an established residential neighborhood and Chester Field Park. This area is shown in Appendix B, Figures 114 and 115.

New station areas may need to be rezoned through the local development review process. Existing stations that are approved during final site selection would likely need rehabilitation and/or upgrading with modern amenities to meet accessibility requirements. For the most part, improvements within these stations would be limited to the existing station site. However, additional property may need to be acquired for parking or other improvements. Other selected station locations may be greenfield[1] or greyfield[2] sites where stations do not exist and will need to be constructed. Impacts on adjacent land uses will be analyzed further during Tier 2 studies, when more specifics are known about station areas. In addition to stations, other improvements outside of existing ROW would include layover and maintenance facilities. The layover and maintenance facility location, size, and other program needs will be defined during Tier 2 studies.

Additional direct impacts would occur adjacent to future station areas and layover and maintenance facilities. The proposed passenger rail service would continue to use existing

[1] Greenfield sites are locations that have been previously undeveloped.

[2] Greyfield sites are formerly developed, economically obsolescent, outdated, failing, moribund and/or underused real estate assets or land.

Amtrak stations at Chicago, La Grange Road, Naperville, Plano, and Princeton, Illinois; and potentially at Omaha, Nebraska. Direct land use impacts adjacent to these areas would be very limited because they are existing stations with current operations and would need modest improvements to accommodate new service. New stations or reuse and modification of pre-existing stations are proposed at Mendota, Geneseo, and Moline, Illinois; Iowa City, Grinnell, Des Moines, Atlantic, and Council Bluffs, Iowa; and potentially Omaha, Nebraska. These stations may have impacts associated with rehabilitation efforts. The Geneseo and Moline stations will be improved as part of the Chicago to Quad Cities Expansion Program. Minimal additional improvements would be needed to these two stations for Chicago to Council Bluffs-Omaha service. The land use surrounding the new or pre-existing stations is described for each station below.

Because pre-existing stations in Mendota, Geneseo, Iowa City, Grinnell, and Atlantic are intact and only rehabilitation of the structures would be expected, no long-term adverse impacts are anticipated in the areas surrounding the stations. The Mendota, Illinois, station has commercial property to the west and residential property to the east of the station. The Geneseo, Illinois, station is surrounded by commercial, industrial, and residential land uses. The Iowa City, Iowa, station is located to the south of downtown and is surrounded by multi-family housing and commercial properties. Land use surrounding the pre-existing station in Grinnell, Iowa, is mostly residential and some commercial. The pre-existing Atlantic, Iowa, station is surrounded by mostly industrial development. (Illinois Department of Agriculture, 2001; and Giglierano, no date)

The Moline, Illinois, station is a proposed multi-modal facility located in downtown Moline. An entertainment center and a subsidiary branch of the Mississippi River are to the north of the station location. A mix of commercial and industrial surrounds the rest of the proposed facility (City of Moline, Illinois, 2001).

Specific sites for passenger rail stations in Des Moines and Council Bluffs, Iowa, and Omaha, Nebraska, have not yet been determined. Potential alternative locations for Des Moines, Council Bluffs, and Omaha stations are shown in Figure 2-5. Final site selection, construction, and operation of these passenger rail stations will be evaluated in subsequent Tier 2 NEPA documents.

An overnight train layover and light maintenance facility would be required in the Des Moines and Omaha/Council Bluffs metropolitan areas. Specific sites for these facilities have not yet been determined; however, they will be evaluated in subsequent Tier 2 NEPA documents when specific sites are identified.

In the Tier 2 NEPA documents, more detailed land use and zoning analysis will occur. This will include detailed impacts on the land uses within and surrounding future station and layover and maintenance facilities in designated impact areas and other areas where ROW acquisition would occur to accommodate faster speeds and additional main line track and sidings as needed. The Tier 2 analyses will focus on site-specific issues and sensitive land uses such as residential, parkland, and institutional (for example, churches and public buildings) uses.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW

for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speed of passenger trains would cause less land use, zoning and property acquisition impacts than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to land use, zoning and property acquisition would be less during the initial implementation phase. Likely land use impacts would be related to improvements to existing stations or construction of new stations and layover and maintenance facilities. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts to land use, zoning and property acquisition would occur to areas within or adjacent to the Potential Impact Area.

3.2.5 Potential Mitigation Measures

Potential mitigation measures include minimizing the Build Alternative footprint and associated improvements to existing ROW, layover facility, and station areas to the greatest extent possible. When the acquisition of adjacent land cannot be avoided, the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Civil Rights Act of 1964 would be followed. Examples of mitigation measures may include landscape and hardscape[3] screening through a combination of trees, shrubs, groundcover, and other screening as a buffer between the station, layover and maintenance facility, or other associated improvements and adjacent neighborhoods, parks, or other features. During Tier 2 analyses, the extent of land use, zoning, and property acquisition impacts would be analyzed for potential mitigation issues that may be identified through agency coordination and the public involvement process. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.3 AGRICULTURAL RESOURCES

The agricultural resources assessed in this Tier 1 EIS include land with soils designated by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) as prime farmland and farmland of statewide importance, as defined in Section 3.3.2.

3.3.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to farmland is the Farmland Protection Policy Act of 1981 (7 CFR Part 658). Other regulations that pertain to farmland on a state level include the the Illinois Farmland Preservation Act (IFPA) (505 ILCS 75) and Iowa Code Chapter 352, County Land Preservation and Use (Iowa Code §§ 352.1 to 352.13 (2005)). There is no farmland in the Study Area in Omaha, Nebraska.

Collection of information included GIS data from the NRCS database regarding soil designations of prime farmland and farmland of statewide importance within the Study Area.

[3] Hardscapes are “structures (as fountains, benches, or gazebos) that are incorporated into a landscape.” (http://www.merriam-webster.com/dictionary/hardscape , accessed 8/7/12)

3.3.2 Affected Environment

The majority of the Study Area in Illinois and Iowa is agricultural land composed of soils that are highly suitable for growing crops. The Study Area in Nebraska is located in urban built-up areas of the City of Omaha and does not include farmland. Agricultural lands near or within the Study Area in Illinois and Iowa are shown in Appendix B, Figures 1 through 162. The Farmland Protection Policy Act of 1981 defines farmland and separates it into three categories, as follows:

- **Prime Farmland** – "Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary" of USDA (7 USC 4201(c)(1)(A)). These are soils that occur on slopes less than 6 percent.
- **Unique Farmland** – "Land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary…. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables" (7 USC 4201(c)(1)(B)).
- **Farmland of Statewide or Local Importance** – "Farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, and that the Secretary determines should be considered as farmland" (7 USC 4201(c)(1)(C)). These are soils that generally can also be highly productive for cropland, but occur on slopes greater than 6 percent or have limitations in drainage or flood control that are more difficult to overcome.

Farmland does not include land already in or committed to urban development or water storage. Therefore, the city limits of towns and cities within the Study Area were excluded from the farmland assessment, as were bodies of water. There are no soils designated as unique farmland in the Study Area.

The prime farmland soils within the Study Area are categorized with qualifiers, as follows:

- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated

Within the Study Area, the majority of prime farmland soils are on slopes of less than 6 percent and are composed of mostly silt loams and silty clay loams as well as minor amounts of loams, sandy loams, fine sandy loams, loamy fine sands, and clay loams. The soils designated as farmland of statewide importance are generally on slopes that are 6 percent or greater, the majority of which are loams, silt loams, and silty clay loams as well as minor amounts of clay loams, sandy loams, loamy sands, fine sandy loams, and loamy fine sands.

3.3.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on farmland resources are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would contribute minimal impacts on farmland soils as a result of constructing new track embankment for the Wyanet Connection in addition to potential culvert replacements/extensions and bridge replacements/additions in other portions of the Corridor. The Chicago to Quad Cities Expansion Program would impact both prime farmland and farmland of statewide importance. Specific quantitative impacts on farmland from the Chicago to Quad Cities Expansion Program would be determined as the project progresses through its required Tier 2 NEPA documentation. The Eola Yard improvements would not impact farmland.

3.3.4 Impacts of Build Alternative

Construction of the Build Alternative would directly impact farmland where areas of additional ROW would be necessary. Those impacts would be relatively minor for farmland properties, constituting approximately 5 percent of the Study Area, because only minor linear amounts would be needed for adding track and siding to the existing railroad grade. No severances of existing farmland would occur. The total approximate impacts on farmland soils would be as shown in Table 3.3-1.

Table 3.3-1. Farmland Impacts

State	Prime Farmland (Acres)	Farmland of Statewide Importance (Acres)
Illinois	1,460	150
Iowa	1,730	690
Nebraska	0	0
Total	**3,190**	**840**

With the initial implementation phase, less ROW for improvements would cause less farmland impacts than that of the ultimate proposed implementation. Consequently, the potential for impacts to farmland areas would be less during the initial implementation phase. As the Project extends westward, more impacts would occur to farmland areas within or adjacent to the Potential Impact Area.

3.3.5 Potential Mitigation Measures

Because the Build Alternative would result in impacts on farmland, coordination would take place with NRCS as part of the Tier 2 NEPA process. Completion of form NRCS-CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects, would be required to determine if farmland impacts are above the threshold level for consideration of farmland protection measures. A form would need to be developed for each county traversed by the Project.

In addition, to comply with the 1982 Illinois Farmland Preservation Act, notification would be sent to the Illinois Department of Agriculture, Bureau of Land and Water Resources, regarding any land acquisition projects located outside municipal corporate limits. This

would be initiated during the Tier 2 NEPA process. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.4 SOCIOECONOMIC ENVIRONMENT

The evaluation of the social and economic environment considers population, employment, demographic shifts, community disruption or cohesion, effects on commerce, and general state, regional, and local economies. In addition to assessing potential adverse impacts from community disruption, the assessment considers likely benefits resulting in any potential increase in economic activity in and near the Study Area.

3.4.1 Methodology and Regulatory Requirements

Applicable livability principles from the Partnership for Sustainable Communities—a joint initiative from the U.S. Department of Housing and Urban Development (HUD), the U.S. Department of Transportation (USDOT), and the U.S. Environmental Protection Agency (USEPA)—are considered. Socioeconomic considerations were evaluated in accordance with FRA's Environmental Procedures.

Social and economic characteristics were gathered from the U.S. Census Bureau's 2010 Census and the American Community Survey (ACS). Data collected include population and employment (existing and future trends), demographic shifts, general housing information, and community services, such as schools and emergency services. Major social communities and economic centers along the Study Area were identified from GIS data. Demographic data were collected at the county level within rural areas and at the city level within urban areas (that is, communities with population greater than 50,000).

3.4.2 Affected Environment

The socioeconomic environment near or within the Study Area is shown in Appendix B, Figures 1 through 162. Buildings and land uses comprising the socioeconomic environment within the cities and small towns include businesses, schools, churches/places of worship, parks, community centers, hospitals, emergency facilities, and other public buildings.

3.4.2.1 Population

The Study Area comprises nine counties in Illinois (Cook, DuPage, Kane, Kendall, DeKalb, LaSalle, Bureau, Henry, and Rock Island), fourteen counties in Iowa (Scott, Muscatine, Cedar, Johnson, Iowa, Poweshiek, Jasper, Polk, Dallas, Madison, Guthrie, Adair, Cass, and Pottawattamie), and one county in Nebraska (Douglas). These counties have a combined 2010 population of 8,778,473 (U.S. Census Bureau, 2010). Population within these counties increased by 11.4 percent between 1970 and 2010. This compares to a 51.9 percent increase in the overall U.S. population, a 15.4 percent increase for the State of Illinois, a 7.9 percent for the State of Iowa, and a 21.3 percent increase for the State of Nebraska over the same time period. A summary of population trends for all counties in the Study Area is included in Appendix C, Table 1.

Between 1970 and 2010, the population of five counties in Illinois (DuPage, Kane, Kendall, DeKalb, and LaSalle) increased, while the population of four counties (Cook, Bureau, Henry, and Rock Island) declined. During the same time period, the population of ten counties in Iowa (Scott, Muscatine, Cedar, Johnson, Iowa, Poweshiek, Polk, Dallas, Madison, and Pottawattamie) increased, while the population of four counties (Jasper, Guthrie, Adair, and Cass) declined. The population of Douglas County, Nebraska, increased by 32.8 percent between 1970 and 2010. The single largest gain in population by percent was Kendall County, Illinois, which experienced a 335 percent increase between 1970 and 2010. The next largest population change by percentage was Kane County, Illinois, at 105.3 percent and Dallas County, Iowa, at 153.5 percent over the same time period. The largest population declines by percentage in the counties in the Study Area over this time period were Adair and Cass counties in Iowa at 19 and 17.9 percent, respectively. Throughout the Study Area, counties in rural areas outside of urban areas have tended to have population declines while counties within urban areas have tended to grow steadily. The exception is urban counties within older industrial areas outside of Chicago and the Quad Cities that have experienced population declines due to a general slowdown of the manufacturing industry. Appendix C, Table 1 shows population change for all counties within the Study Area compared to each state and the United States. Appendix C, Tables 2 and 3 show population changes for all cities and villages within 0.25 mile of the Study Area.

There are 82 urban areas within 0.25 mile of the Study Area. Eleven of the 82 cities (Chicago, Cicero, Berwyn, Naperville, and Aurora, Illinois; Davenport, Iowa City, Des Moines, West Des Moines, and Council Bluffs, Iowa; and Omaha, Nebraska) are classified as urban. The total population of these urban areas represents almost 92 percent of the total population of all cities and villages within 0.25 mile of the Study Area. Chicago alone comprises 68 percent with a 2010 population of 2,695,598. Between 1970 and 2010, Chicago and Cicero, Illinois, experienced significant population declines, while the remaining eight cities experienced modest to significant population increases. A portion of Chicago's population decline can be attributed to an exodus to the Chicago suburbs during the 1970s and 1980s, including suburban communities within the Study Area such as Berwyn, Naperville, and Aurora, Illinois. In the 1990s and 2000s, population decline in Chicago and population increases in the suburbs slowed.

Outside of the Chicago metropolitan area, the largest urban areas are Davenport, Iowa City, Des Moines, and Council Bluffs, Iowa, and Omaha, Nebraska. Each of these cities has experienced modest population increases between 1970 and 2010. Other urban areas comprise portions of larger metropolitan areas. East Moline, Moline, and Rock Island in Illinois, and Davenport and Bettendorf in Iowa, on the Illinois/Iowa border comprise a larger metropolitan area referred to as the Quad Cities, with a total population of 381,342. West Des Moines, which has experienced a significant population increase between 1970 and 2010, is part of the Des Moines metropolitan area. Council Bluffs, which has experienced a modest population increase from 1970 to 2010, is part of the Omaha/Council Bluffs metropolitan area.

The remaining cities and villages with a population of less than 50,000 comprise approximately 8 percent of the total population of all areas within 0.25 mile of the Study Area. These cities and villages tend to be very small, with a median population of 2,093.

With the exception of suburban communities outside large metropolitan areas, a majority of these communities had a stable to steadily declining population between 1970 and 2010.

3.4.2.2 Employment

There are a number of diverse industry employment sectors within the Study Area, especially within urbanized counties. The employment sectors in the most urbanized counties (Cook, DuPage, Kane, LaSalle, and Rock Island counties in Illinois; Scott, Johnson, Polk, and Pottawattamie counties in Iowa; and Douglas County in Nebraska) are very diverse with few dominant sectors. However, the employment sectors in the rural counties are largely dominated by retail trade and manufacturing. Agriculture is still an important industry sector within these counties; however, farming operations are becoming more efficient and are less labor dependent than in the past. Overall, the dominant industry sectors for all counties are educational services, health care, and social assistance. This is consistent with the statewide averages. Appendix C, Table 4 provides a detailed summary of industrial employment sectors for each county in the Study Area.

Only one county in Illinois (Cook) and five counties in Iowa (Scott, Muscatine, Jasper, Polk, and Pottawattamie) have a 2010 unemployment rate greater than their respective statewide average. The majority of counties with high unemployment rates are urbanized; however, there are a few exceptions in rural counties including Muscatine County, Iowa, which has the second highest unemployment rate of any county in the Study Area. Cook County, Illinois, which includes the City of Chicago, has the highest unemployment rate in the Study Area. Appendix C, Table 5 provides a detailed summary of 2010 employment status statistics for all counties within the Study Area.

The Public Works and Economic Development Act of 1965, as amended (PWEDA) indicates that an area is considered economically distressed if it has an unemployment rate that is at least 1 percent greater than the national average unemployment rate (8.3 percent, July 2012). Currently, only one county within the Study Area, Cook County, Illinois (9.9 percent), meets this criterion; however, Muscatine County (8.1 percent) is close to the national average unemployment rate. Data on per capita income for all counties in the Study Area are provided in Appendix C, Table 6.

3.4.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on socioeconomic conditions are not anticipated beyond those that could occur due to other projects. Socioeconomic conditions cover a wide variety of interrelated social and economic factors, including demographic shifts, increased economic activity, and employment opportunities. The Chicago to Quad Cities service is expected to contribute minimal impacts to socioeconomic conditions through construction funding being expended for the Project and temporarily improving employment and expenditures in local markets. In the case of the No-Build Alternative, slight demographic shifts and increased economic activity would be limited to modest improvements to passenger rail service between Chicago and Moline, Illinois. For station locations along the Chicago to Quad Cities service, there would be an increase in direct local employment with the potential for indirect employment through nearby development.

3.4.4 Impacts of Build Alternative

The Build Alternative would result in minimal impacts on socioeconomic conditions. Economic impacts would include the potential for disruption of vehicular traffic to existing businesses and community facilities including schools, churches/places of worship, parks, community centers, hospitals, emergency services, and other public buildings along the route alternative during construction, which may make it difficult to access these uses.

There is the potential that some business properties may need to be acquired; in these cases, the business would be compensated for the acquisition and the relocation in compliance with federal and applicable state law. Businesses closing or relocating outside of the local area would cause a reduction in property tax income for the local government. These impacts would be identified during Tier 2 analysis after design details are known, and mitigated in Tier 2 through coordination with local communities and agencies and other measures as described in Section 3.23.

Long-term economic impacts along the Corridor would be beneficial because the Chicago to Council Bluffs-Omaha service would provide connections to major markets in the Study Area. There would be temporary access impacts during construction and long-term impacts for travel across at-grade crossings by the public and community service vehicles. While the Chicago to Council Bluffs-Omaha service would cause some disruptions to existing businesses and neighborhoods during construction, appropriate measures would be taken to mitigate impacts to adjacent areas. These measures are described in Section 3.23. Other impacts potentially affecting social conditions include accessibility and safety issues to adjacent neighborhoods and activity centers. Appropriate safety measures would be taken and are described in Section 3.7.

The Build Alternative includes a southern alignment option through southern Des Moines (Des Moines Design Option 3) that has the potential to disrupt established neighborhoods and existing economic activity with the construction of a new rail line. This area is shown in Appendix B, Figures 114 and 115. Potential direct impacts include the displacement of homes and businesses. Impacted development within this area is described in further detail in Section 3.2. Potential indirect impacts include disruption of travel patterns during and after construction through the construction of new rail lines that would transect the existing street network within the area. In most areas, a rail corridor already exists, so community cohesion would be minimally affected overall, with some impacts projected in urban areas.

Short-term economic benefits would be derived from the Project through construction of improvements along the corridor and future station areas. Long-term economic benefits would include the potential for increased economic activity within cities along the Study Area near identified stations. The Project may help to revitalize urbanized areas near future stations by attracting higher-density and mixed-use development, which provides new employment and housing options. Additionally, the Project would link cities along the Study Corridor, thereby improving mobility and expanding employment opportunities over a larger geographic area; this benefits employers by expanding the labor market and offering employees more choices of where to live. The location of housing in relation to jobs, services, and amenities appreciably enhances the quality of life. The level of benefit depends on the frequency and speed of service. For areas between stations, there would be limited economic benefits. Due to these long-term economic benefits and quality of life benefits, as

stated above, high-speed passenger rail has broad support within major communities throughout the Study Area.

The following communities within the Study Area have active advocacy organizations supporting new passenger rail service to promote economic development:

- The Quad Cities Rail Coalition, sponsored by the Quad Cities Chamber of Commerce, is an advocacy group promoting new passenger rail service to provide a positive impact on the region's economy and quality of life. This coalition of 10,000 members includes elected officials, community leaders, community organizations, and residents. Renew Moline also has created economic development plans using the new Amtrak station as a catalyst for development and economic revitalization.
- The Greater Des Moines Partnership sponsored *Capital Crossroads*, a regional plan that advocates support for high-speed rail through the Des Moines metropolitan area. Building on the planned high-speed rail service between Chicago and the Quad Cities, *Capital Crossroads* recommends raising awareness and building support for extending the line through Des Moines to Omaha. The Greater Des Moines Partnership is an economic development advocacy group supported by over 280 public and private investors and focuses on economic development, workforce attraction and retention, downtown development and regional business development. Additionally, high-speed rail service for the Des Moines metropolitan area will be considered in the *Tomorrow Plan*, currently under development, which provides a long-term blueprint for the region.
- In the Omaha/Council Bluffs metropolitan area, the Metropolitan Area Planning Agency (MAPA), a COG, will begin a similar process in the fall of 2012 to develop a regional vision named *Heartland 2050*. MAPA's *Long Range Transportation Plan 2035* notes existing planning efforts for high-speed rail service; however, it does not make specific recommendations. Furthermore, these plans and initiatives articulate the economic and social benefits of the Project from a local perspective. Overall, local, regional, and state economics are anticipated to benefit from the Project, both in the short term during construction and long-term during operation of the Project.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speed of passenger trains would cause less impacts and benefits to the socioeconomic environment than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to the socioeconomic environment would be less during the initial implementation phase and would be related to any improvements to existing or new station areas and maintenance/layover facilities. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts and benefits to the socioeconomic environment would occur to areas within or adjacent to the Potential Impact Area.

3.4.5 Potential Mitigation Measures

Direct socioeconomic impacts could include residential and business displacements in locations where improvements and ROW acquisition would be necessary outside of existing railroad ROW. Temporary construction impacts on adjacent residents and businesses would occur through noise, vibration, and disruptions to local traffic. Both of these impacts are likely to occur near stations. At this time, only general station area locations are known. When these areas are further defined and delineated in the Tier 2 analysis, potential impacts on socioeconomic conditions will be identified along with strategies to avoid or mitigate these impacts. In addition, public involvement and agency coordination activities may result in identification of potential mitigation needs. Specific mitigation measures, to the extent required, will be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.5 TITLE VI AND ENVIRONMENTAL JUSTICE

The environmental justice assessment was completed in accordance with Title VI of the Civil Rights Act of 1964; Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; the USDOT Order on Environmental Justice; and updated guidance implementing the USDOT order. The assessment also addresses limited English proficiency (LEP) as required under Executive Order 13166. The assessment was conducted to determine whether minority or low-income communities, potential environmental justice areas, are present within or adjacent to the Study Area. Minority populations may include, but are not limited to, African Americans, Hispanics, Asian Americans, and Native Americans. Low-income is defined as a person whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines. A more detailed assessment of these populations will be conducted during Tier 2 analyses when more specific impacts are known. The mobility of elderly and disabled populations within the Study Area is addressed in Section 3.6.

3.5.1 Methodology and Regulatory Requirements

The methodology for conducting the review and evaluation of minority and low-income populations is in accordance with federal regulations and guidelines, including NEPA; FRA's Environmental Procedures; guidelines published by CEQ on implementing NEPA; Environmental Justice Guidance (December 10, 1997); Executive Order 12898; and DOT Order 5610.2(a)

Demographic data from the 2010 Census, including total population, ethnicity, and poverty status, were compiled at the city and county levels within and adjacent to the Study Area. Population and minority (racial and ethnic) data are reported by the U.S. Census Bureau, and income and language (LEP) data are reported by the ACS. State-level data were also gathered as a basis for comparison. At potential station locations, census-tract-level data were gathered for adjacent tracts, as appropriate.

The demographic composition of the No-Build and Build Alternatives in this Tier 1 EIS were reviewed to determine whether minority populations and/or low-income populations that exceed the state averages are present. Data from counties along the Study Area were also

aggregated and used for comparison. Minority and low-income populations tend to be concentrated in urban areas. This trend was confirmed and documented in the analysis.

To determine if an environmental justice population would be disproportionally adversely impacted by the Project, the existence and location of substantial minority and low-income populations within the Study Area was determined. Minority and low-income populations within the affected areas were compared to the statewide average. Environmental justice populations were identified where either the environmental justice population 1) is greater than 50 percent of the affected area's population, or 2) is greater than 50 percent of the statewide or citywide average (Environmental Justice Guidance, Federal Transit Administration, Region VII).

Using GIS data as well as spatial and demographic data from the 2010 Census and the ACS, the counties and cities in the Study Area were analyzed to highlight areas of substantial minority populations and/or low-income populations. Counties, cities, and/or census tracts within the Study Area were then highlighted for environmental justice populations. The potential for clusters of environmental justice populations being disproportionately adversely affected were evaluated and documented.

A potential direct impact is the displacement of residents or businesses. However, for the Tier 1 EIS, potential displacement areas were identified and compared based on estimated ROW needs because exact areas for ROW acquisition are not known during the Tier 1 EIS. A qualitative evaluation was conducted to determine potential indirect impacts, which are discussed in Section 3.26.

Specific impacts would be identified and assessed in the Tier 2 NEPA documents, and a determination would be made as to whether potential impacts are disproportionately high and adverse as compared to other affected populations. During Tier 2 analysis, LEP populations would be identified, and specific approaches to providing access to services will be documented. A preliminary screening of these populations was conducted within cities with significant minority populations.

3.5.2 Affected Environment

Aerial images with environmental resource information are provided in Appendix B, Figures 1 through 162. Although minority and low-income population data are not portrayed directly in the figures, urban areas (which are evident in the figures) typically host a higher proportion of minority and low-income populations.

Census data were collected at the county level for the Study Area and the city level within 0.25 mile of the Potential Impact Area to identify potential environmental justice populations. There are 24 counties transected by the Study Area (9 in Illinois, 14 in Iowa, and one in Nebraska). There are 82 cities and villages within 0.25 mile of the Study Area (40 in Illinois, 41 in Iowa, and one in Nebraska).

Minority Populations

Five counties (Cook in Illinois; Scott, Johnson, and Polk in Iowa; and Douglas in Nebraska) and ten cities and villages (Chicago, Cicero, Berwyn, and Aurora, Illinois; Davenport, West Liberty, Iowa City, Coralville, and Des Moines, Iowa; and Omaha, Nebraska) have a minority population that is 50 percent greater than their respective statewide average.

Chicago and Cicero are the only cities to have a minority population in excess of 50 percent of the total population. Appendix D, Tables 1, 2, and 3, provide a summary of population by race for all counties, cities, and villages within 0.25 mile of the Study Area.

Low-Income Populations

No counties in the Study Area have a low-income population that is 50 percent greater than their respective statewide average (see Appendix D, Table 4). However, eight cities and villages (Chicago and Carbon Cliff, Illinois; and Davenport, Atalissa, Iowa City, University Heights, Marengo, and Ladora, Iowa) have a low-income population that is 50 percent greater than their respective statewide average. A summary of low-income populations for all cities and villages within 0.25 mile of the Study Area is provided in Appendix D, Tables 5 and 6. No county, city, or village in the Study Area had a low-income population in excess of 50 percent of the total population.

3.5.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on environmental justice populations are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would occur through La Grange and Moline, Iowa, which include environmental justice populations. However, that program would likely not cause disproportionately high and adverse impacts to these populations because it is not anticipated that appreciable ROW would be required through urban areas where these populations are highest. West of Moline, Illinois, minority and low-income populations would not realize the mobility and economic benefits provided through access to new passanger rail service.

3.5.4 Impacts of Build Alternative

The Build Alternative could have direct and indirect impacts on minority and low-income populations. Direct impacts affect environmental justice populations through potential property displacements for new or improved stations as well as the need for additional ROW for track and associated improvements on existing alignments or additional ROW for new alignments. Most improvements would be within existing ROW. Improvements outside of existing ROW are limited to areas that would be upgraded from single track to double track, new alignment connections at Wyanet and potentially Des Moines, intersection safety improvements, and upgrades to stations for new passenger rail service. Indirect impacts affect adjacent environmental justice populations temporarily through increased traffic congestion, delays, noise, and vibrations during construction. A more detailed assessment of indirect impacts is presented in Section 3.23.

Other impacts would occur through increased noise and vibrations caused by the operation of new higher speed rail service; this service would be new along IAIS rail lines within the Corridor and would be additional service along the BNSF component of the Corridor. Other direct and indirect impacts relate to safety at rail crossings and traffic delays due to increased train speeds and volumes through counties, cities, and villages with environmental justice populations. Section 3.7.4 addresses public health and safety impacts in more detail.

Based on the noise analysis documented in Appendix F and summarized in Section 3.8.4, the Build Alternative is projected to result in 1.0 new moderate noise impact per mile, 0.6 new

severe noise impact per mile, and a combined total of 1.6 noise impacts per mile. The incremental increase in train noise is not significant; consequently, environmental justice populations are not anticipated to be disproportionately affected by noise. A more detailed evaluation of moderate and severe noise and vibration impacts for specific areas within the Project Impact Area would be conducted during Tier 2 analyses when specific ROW requirements and improvements are known.

2010 Census data were analyzed for census tracts transected by and adjacent to potential station sites within the Study Area. Potential station locations and the demographic, race, and poverty level information for all of the affected census tracts are provided in Appendix D, Tables 7, 8, 9, and 10. Demographic data for stations located in Des Moines and Council Bluffs, Iowa, and Omaha, Nebraska, were not included because the locations of those stations are not known at this time. There are minority populations greater than 50 percent of their respective citywide average within impacted census tracts at the following stations: La Grange Road (Census Tract 8195) and Moline (Census Tract 223) in Illinois; and Atlantic (Census Tract 1905) in Iowa. In addition, there are low-income populations greater than 50 percent of their respective citywide average within impacted census tracts at the following stations: La Grange Road (Census Tract 8195) and Moline (Census Tract 223) in Illinois; and Iowa City (Census Tract 16), Grinnell (Census Tract 3704), and Atlantic (Census Tract 1905) in Iowa.

The Build Alternative includes an optional alignment through Des Moines (Des Moines Design Option 3) that would impact both minority and low-income populations. This area is shown in Appendix B, Figures 57 and 58. Census Tract 52 has a low-income population of 50.9 percent, which is substantially greater than the citywide average of 16.3 percent. Specific demographic information for minority and low-income populations is provided in Appendix D, Tables 11 and 12. Through the early conceptual design process, the Potential Impact Area was limited to minimize impacts on adjacent uses. Through refinements in the conceptual design, impacts on adjacent uses can potentially be further minimized during the Tier 2 analyses.

An analysis of English proficiency for cities with substantial minority populations is provided in Appendix D, Table 13. Minority populations within the Study Area may include large proportions of populations that have LEP. During Tier 2 analyses, these affected populations would be identified for impacted areas, and specific approaches to providing access to services and for public involvement would be documented as appropriate.

The higher speed passenger rail service under the Build Alternative would provide economic and quality of life benefits to minority and low-income populations through improved mobility and access to an alternative transportation mode serving multiple destinations througout the Corridor. However, these benefits would be limited to the area near the identified station stops. Some of these populations would also be impacted through potential displacements, noise, increased congestion, and other impacts. Specific impacts would be evaluated and addressed during Tier 2 analyses.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less

ROW for improvements would be required and passenger trains would run at speeds slower than 110 mph, and the potential for impacts to minority and low-income populations would be less than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts and benefits to minority and low-income populations would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts and benefits to environmental justice populations would occur to areas within or adjacent to the Potential Impact Area.

3.5.5 Potential Mitigation Measures

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.6 ELDERLY AND PEOPLE WITH DISABILITIES

This environmental consideration includes an assessment of the transportation and mobility of elderly populations and populations with physical or mental disabilities. The assessment was performed with the acknowledgement that these populations live within and along the Corridor, but does not rely on data for the specific numbers of these populations by location.

3.6.1 Methodology and Regulatory Requirements

The U.S. Department of Health and Human Services, Administration on Aging, considers persons that are 65 years or older as elderly (Administration on Aging, 2011). Elderly populations are protected under the Age Discrimination Act of 1975, as amended, and the Older Americans Act of 1965, as amended. Populations with disabilities are protected under the Americans with Disabilities Act of 1990 and the Rehabilitation Act of 1973. Generally, these four acts ensure that those associated population groups are not excluded from participation in, denied the benefits of, or subjected to discrimination under any program or activity receiving federal financial assistance.

The U.S. Department of Health and Human Services – Administration on Aging website and the Department on Aging websites of each state were reviewed in regard to transportation and mobility issues (Illinois Department on Aging, 2012; Iowa Department on Aging, 2012; Nebraska State Unit on Aging, 2012). In addition, various metropolitan websites were reviewed to obtain public transportation information.

3.6.2 Affected Environment

Gathered data were reviewed and a general description of the means of transportation available to elderly populations and populations with physical or mental disabilities was prepared. Elderly and disabled persons are more likely to have health conditions, including vision, hearing, or mobility losses, which prevent them from driving. This increases their reliance on Americans with Disabilities Act (ADA) accessible transportation services that provide a link to other services that are needed in order to remain independent. The means of transportation that cross or travel adjacent to the Study Area, and that are available to elderly and disabled populations in the major metropolitan regions of the Study Area, include fixed-route bus services, fixed-route commuter and passenger rail services, and paratransit services

in which people with disabilities can reserve transportation in advance. Persons with disabilities which prevent them from riding the regular fixed route public transit services are eligible for paratransit service.

Aerial images with environmental resource information are provided in Appendix B, Figures 1 through 162. Although elderly and disabled data are not portrayed directly on the figures, the major transportation network in the urban areas and small towns (which are evident in the figures) is shown. The means of transportation available to elderly and disabled populations are summarized below.

3.6.2.1 Chicago/Naperville, Illinois

In the Chicago metropolitan area, including Naperville, ADA accessible public transportation is provided under the Regional Transportation Authority (RTA) as follows:

- *Chicago Transit Authority* (CTA) – Fixed-route bus and commuter rail services. (CTA, 2011)
- *Metra* fixed-route commuter rail service – Currently operating on the BNSF rail corridor from downtown Chicago to Aurora. (Metra, 2012)
- *Pace* – Fixed-route suburban bus service (Pace, 2012a) with direct connections to and from CTA and Metra (Pace, 2012c), and paratransit services to persons with disabilities. (Pace, 2012b)
- *Amtrak* – Currently operating passenger trains from downtown Chicago to Wyanet, Illinois in the Study Area. (Amtrak, 2012).

3.6.2.2 East Moline/Moline/Rock Island, Illinois and Davenport/Bettendorf, Iowa (Quad Cities)

In the Quad Cities metropolitan area, ADA accessible transportation services are provided as follows:

- *Rock Island County's Metro* – Fixed-route bus service in East Moline, Moline, and Rock Island, Illinois, and paratransit service for people with disabilities. (MetroLINK, 2012)
- *CitiBus* – Fixed-route bus service in Davenport, Iowa and a paratransit service through a contract with River Bend Transit, for people with disabilities. (City of Davenport, Iowa, 2012)
- *Bettendorf Transit System* – Fixed-route bus service that connects with CitiBus and crosses the Mississippi River to downtown Moline where it provides a connection with the Metro, and provides a paratransit service through a contract with River Bend Transit. (Bettendorf, Iowa, 2012).

3.6.2.3 Iowa City/Coralville, Iowa

In the Iowa City/Coralville metropolitan area, ADA accessible transportation services are provided as follows:

- *Cambus* – University of Iowa's fixed-route bus transportation service routes available to students, faculty, staff, and the general public, and paratransit service for students, faculty, and staff who are disabled. (University of Iowa, 2009).

- *Iowa City Transit* (ICT) - Fixed-route bus service. (City of Iowa City, Iowa, 2006-2012a)
- *Coralville Transit System* (CTS) – Fixed-route bus service routes. (City of Coralville, Iowa, 2012)
- *Johnson County SEATS* (Special needs and Elderly Assisted Transportation System), a paratransit service provided by ICT and CTS. (City of Iowa City, Iowa, 2006-2012b)

3.6.2.4 Des Moines, Iowa

In the Des Moines metropolitan area, public transportation and ADA accessible transportation is provided as follows:

- *Des Moines Area Regional Transit Authority* (DART) – Fixed-route bus service and a paratransit service to elderly and disabled persons (DART, 2010).
- *Heart of Iowa Regional Transit Agency* (HIRTA) – Door-to-door bus services to the general public; with an emphasis on the elderly, low-income persons, and persons with disabilities; on a demand-response basis in a seven-county area outside of, and surrounding Polk County (HIRTA, 2012). The Study Area lies within three of those counties: Jasper, Dallas, and Madison.

3.6.2.5 Atlantic, Iowa

In the Atlantic area, accessible public transportation (small buses and vans) is provided by the Southwest Iowa Transit Agency (SWITA), which serves all residents in an eight-county area (Southwest Iowa Planning Council, 2012), two of which are in the Study Area: Cass and Pottawattamie.

3.6.2.6 Omaha/Council Bluffs, Iowa

In the Omaha/Council Bluffs metropolitan area, ADA accessible transportation services are provided as follows:

- *Metro* – Fixed-route bus service, with several routes on the Omaha side and a few that travel into the Council Bluffs area, and a paratransit service within the Omaha city limits for people with disabilities (Transit Authority of the City of Omaha, 2012a and 2012b).
- *Special Transit Service* (STS) – Paratransit service within the Council Bluffs city limits, provided by the Department of Public Works for people with disabilities (City of Council Bluffs, Iowa, 2012).

3.6.2.7 Intercity Bus Service

Three commercial bus lines, Burlington Trailways, Greyhound, and Megabus, offer ADA accessible transportation service between Omaha and Chicago, enabling the elderly and disabled persons to travel between intermediate major urban areas as follows:

- *Burlington Trailways* – Chicago, Naperville, Moline, Rock Island, Davenport, Iowa City, Des Moines, and Omaha. (Burlington Trailways, 2012)

- *Greyhound* – Chicago, LaSalle, Davenport, Iowa City, Des Moines, Atlantic, and Omaha (Greyhound, 2011)
- *Megabus* – Chicago, Iowa City, Des Moines, and Omaha. (Megabus.com, 2012)

3.6.2.8 Intercity Airline Service

Four airlines provide direct nonstop service between Chicago and Omaha: American Airlines, Southwest Airlines, United Airlines, and U.S. Airways. These airlines provide transportation services that accommodate the elderly and people with disabilities. Nonstop airline service is also offered between Chicago and the intermediate major urban areas as listed below. However, airline travel from Omaha to any of those intermediate cities, or between any of the intermediate cities served by airlines, is indirect and requires at least two flights, with a connection in an airline hub city such as Chicago, Minneapolis, Denver, or Houston.

- *American Airlines* – Chicago, Moline, Des Moines, Omaha (American Airlines, 2012)
- *Southwest Airlines* – Chicago, Des Moines (service began September 30, 2012), Omaha (Southwest Airlines, 2012)
- *United Airlines* – Chicago, Moline, Des Moines, Omaha (United Airlines, 2012)
- *U.S. Airways* – Chicago, Moline, Iowa City, Des Moines, Omaha (U.S. Airways, 2012)

3.6.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and direct impacts on the elderly and people with disabilities, as well as their transportation and general mobility, are not anticipated beyond those that could occur due to other projects. However, the Chicago to Quad Cities service would not result in permanent adverse impacts on the transportation and mobility of the elderly and people with disabilities, as there would be no permanent change of existing public transportation routes. Minimal temporary impacts could occur as a result of some detours or delays during construction in the vicinity of grade crossing improvements related to the Chicago to Quad Cities Expansion Program. In addition, beneficial impacts would occur as a result of providing an additional means of accessible public transportation between Chicago and the Quad Cities, and the Eola Yard improvements would reduce train traffic congestion and improve on-time performance of passenger train service.

3.6.4 Impacts of Build Alternative

The Build Alternative would have no permanent direct adverse impacts on the existing transportation services and general mobility of elderly persons and persons with disabilities. Although minimal temporary impacts on existing public transportation routes could occur as a result of detours or delays during construction in the vicinity of at-grade and grade-separated crossing improvements, the proposed Project facilities and services would provide beneficial impacts by improving or developing accessible station facilities and improving at-grade crossings of existing public transportation routes. The proposed Project would also provide an additional means of accessible public transportation for the elderly and disabled populations, support expanded transit operations for efficient use of the transit system, and

increase the availability of transportation options that connect to other cities beyond their immediate region.

Through ROW acquisition, it is possible that some elderly populations and populations with physical or mental disabilities could be displaced. Those impacts would be addressed along with the general population as described in Section 3.2.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would cause less temporary construction impacts to the existing public transportation system than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts on the elderly and disabled populations, the public transportation system, and the beneficial effects on the general mobility of the elderly and disabled populations would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts and benefits realized for the general mobility of the elderly and disabled population would occur to areas within or adjacent to the Potential Impact Area.

3.6.5 Potential Mitigation Measures

A more detailed analysis of potential adverse and beneficial impacts on the elderly and disabled populations, mitigation measures, and the public involvement process would be provided in the Tier 2 NEPA documents. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction. It is anticipated that any adverse impacts from the Project on the elderly and people with disabilities could be mitigated by providing beneficial ADA compliant services and facilities for those populations. Throughout the NEPA process, public involvement would include public open houses and public information distribution to reach elderly and disabled populations and obtain input regarding issues and concerns of those populations.

3.7 PUBLIC HEALTH AND SAFETY

This discussion includes considerations for the health and safety of residents and communities and for the level of protection that would be provided in relation to construction activities and long-term operations associated with the Project.

3.7.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to public health and safety includes the ADA, the Resource Conservation and Recovery Act of 1976 (RCRA) and its amendments, and the Occupational Health and Safety Act of 1970. Public health and safety considerations were evaluated in accordance with FRA's Environmental Procedures.

Highway/rail at-grade crossing information was collected from the FRA Grade Crossings database. The database provides spatial crossing information that originates from the National Highway-Rail Crossing Inventory Program. Data collection included obtaining the number of existing at-grade crossings along the Study Area. During Tier 2 analysis, more detailed information would be gathered from public outreach efforts for other areas such as unusually busy at-grade crossings or farm crossings.

Publications and resource materials from FRA and other USDOT agencies were reviewed for general safety information including, but not limited to, the Americans with Disabilities Act of 1990, High-Speed Passenger Rail Safety Strategy (FRA, 2009), the Rail Safety Improvement Act of 2008 (Public Law 110-432), and the Federal Rail Safety Act (FRSA) (49 USC §20109). During Tier 2 analysis, coordination would take place with the host railroads to obtain information regarding the level of protection afforded the public in regard to health and safety issues.

3.7.2 Affected Environment

Aerial photographs illustrating many at-grade rail crossings by roads, trails, and other transportation pathways are shown in Appendix B, Figures 1 through 162.

The Study Area consists of existing BNSF freight and passenger rail lines and IAIS freight rail lines from Chicago, Illinois, through Iowa, to Council Bluffs, Iowa and Omaha, Nebraska. The BNSF line is mostly double and triple track, is signalized, and is under CTC. The IAIS line is single track, is non-signalized, and operates under track warrant control (TWC).

There would be one small section of new track approximately one mile south of Wyanet, Illinois, to create an at-grade connection of the BNSF and IAIS rail lines. Throughout this approximately 500-mile rail Corridor, the rail lines cross numerous public and private roads, highways and interstates with at-grade and grade-separated crossings. Currently, there are approximately 1,033 public or private road/rail crossings within the Study Area. This equates to just over two crossings per mile on average. There are approximately 514 public crossings and 519 private crossings. Approximately 78 percent of these crossings are at-grade and 22 percent grade-separated. The at-grade crossings have various forms of warning devices ranging from active gates and flashing signals to passive protective lights and bells to simple cross-buck warning signs at rural crossings. FRA has established train control requirements for train movements above 79 mph (49 CFR Part 236). For train speeds between 80 to 110 mph, the highest speed being considered for this EIS, FRA recommends the installation of the most sophisticated warning or traffic control devices that fit the location. Examples include dispatcher-controlled electrically locked gates, bells, flashing lights, and constant warning time devices.

Rail improvements must meet the requirements of the Occupational Safety and Health Administration (OSHA), FRA, and the ADA for construction, operations and maintenance. Requirements for public health, such as RCRA, also apply and are addressed in Section 3.10.

3.7.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on public health and safety are not anticipated beyond those that could occur due to other projects. The other projects considered as part of the No-Build Alternative in this Tier 1 EIS are the Chicago to Quad Cities Expansion Program passenger rail project, including the Chicago to Wyanet, Wyanet Connection, and Wyanet to Moline projects. The Chicago to Quad Cities service would contribute to increased train operations along this portion of the Corridor. The Chicago to Quad Cities service would introduce additional passenger trains with speeds of up to 79 mph and new crossings in Wyanet; consequently, the potential for at-grade conflicts would increase without the likely addition of upgraded warning or traffic control devices.

Construction, operations, and maintenance associated with the Chicago to Quad Cities Expansion Program would need to meet OSHA, ADA, RCRA and other requirements to help protect the safety and health of workers and the public.

3.7.4 Impacts of Build Alternative

The Build Alternative would include substantial track and signal upgrades to address public safety and to limit conflicts with existing freight rail service. Along the IAIS line, additional track would be added and a CTC system would be installed, including a wayside signal system and remote control switches. The IAIS's dispatching center would be upgraded as needed. Both BNSF and IAIS's dispatching centers would be automatically notified as trains from one railroad are routed onto the other railroad.

This Build Alternative would provide new passenger rail service on approximately 115 miles of track owned by BNSF between Chicago and Wyanet, Illinois; over 1 mile of new track to connect the BNSF line to IAIS at Wyanet, Illinois; and approximately 378 miles of IAIS track between Wyanet and Council Bluffs, Iowa, and Omaha, Nebraska. With new passenger rail service and anticipated speeds up to 110 miles per hour, existing single track sections would be upgraded to double track, the existing TWC system would be replaced with a CTC system, and existing at-grade crossings would be upgraded as necessary to help ensure that the most sophisticated warning devices appropriate for the area are available for high-speed rail service. Dispatcher-controlled switches would be installed at existing and new freight sidings. Tree and brush clearing would be performed as needed to provide necessary sight distances for the wayside signal system. Construction of these improvements would provide temporary impacts that are described in more detail in Section 3.23. Safety issues would be mitigated through these improvements. During Tier 2 analysis, there would be further evaluation of whether some crossing locations would be closed and others would receive grade-separated crossings. Safety at stations would also be evaluated, with safety improvements proposed as warranted.

When compared to vehicular highway travel, passenger rail service is a safer alternative. According to the National Safety Council, based on miles traveled, personal motor vehicle travel is 12 to 20 times more likely to result in a fatality than passenger rail travel. In addition, construction, operations, and maintenance associated with the Build Alternative would meet OSHA, FRA, ADA, RCRA, and other requirements to help protect the safety and health of workers and the public.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speed of passenger trains would cause less impacts and benefits to public health and safety than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts on public health and safety would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts and benefits to public health and safety would occur to areas within or adjacent to the Potential Impact Area.

3.7.5 Potential Mitigation Measures

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction. Due to the increased speed of HSR service, there are a number of safety measures and strategies that should be considered to protect the health and safety of passengers as well as motor vehicles and pedestrians at existing or new at-grade crossings. FRA guidance recommends the following safety measures and strategies (FRA, 2009):

- Upgrade the existing train traffic control system throughout the entire Corridor including conversion of the existing TWC along the IAIS to CTC.
- Where practical, it is recommended that public and private grade crossings be consolidated along the HSR route. Redundant and/or unsafe crossings (due to proximity of exiting road intersections, skewed geometry, etc.) should be eliminated where alternate access can be reasonably provided.
- For public and private at-grade crossings, especially within and on the fringe of populated areas, install the most sophisticated traffic control/warning device appropriate for the location, such as median barriers, special signage, flashing lights, four-quadrant gates, etc. In general, private crossings should be treated the same as public crossings.
- Private crossings within industrial developments and rural areas with a prevalence of heavy trucks and farm equipment can pose significant dangers. For these private crossings that cannot be closed, consideration should be given to providing a locking device when not in use.
- Active warning systems for pedestrians are essential where the HSR line crosses existing sidewalks, trails, and bike routes. This is especially the case with crossing near parks, schools and other activity centers.
- Education and public outreach are important to prepare road users for the challenges inherent at future HSR crossings. The public will need to be informed that HSR trains travel at significantly higher speeds than existing trains in the Study Area. Exclusively relying on visual and/or audible cues to judge the arrival of HSR trains can be extremely dangerous.
- Station locations may warrant additional security improvements such as extra lighting, surveillance cameras, and other security measures.

3.8 NOISE AND VIBRATION

In general, noise can be defined as unwanted sound. Sound is produced by the vibration of sound pressure waves in the air, and sound pressure levels are expressed in units called decibels (dB). The human hearing organs do not perceive all sounds equally, and a mathematical weighting scale is used to put more emphasis (or weighting) on frequencies that humans perceive, and also to de-emphasize the frequencies that humans do not perceive very well. The A-weighting scale, expressed as A-weighted decibels (dBA), accounts for the human perception of hearing. Estimates of environmental noise in this analysis are expressed with a dimension of time associated with them. Two descriptors are used: L_{eq} and L_{dn}. As used in this analysis, the equivalent noise level (L_{eq}) is an energy-based average noise level that occurs over a 1-hour period. The day-night noise level (L_{dn}) is a combination of 24 consecutive hourly L_{eq} values, with the addition of a 10-decibel penalty to values that occur between 10:00 p.m. and 7:00 a.m. In this manner, the L_{dn} accounts for additional annoyance associated with noise events that occur at night and can potentially disrupt sleep.

Airborne noise and ground-borne vibration were evaluated in this analysis, consistent with precedent applied by FRA on other Tier 1 studies for high speed passenger rail projects. Vibration, as addressed in this analysis, consists of rapidly fluctuating motions through the ground expressed as ground-borne vibration (GBV). Various federal agencies establish noise and vibration criteria to help ensure that federally funded projects are evaluated for noise and vibration impacts compared to criteria. The Federal Transit Administration (FTA) and FRA established similar procedures and guidelines for assessing train noise and categorizing impacts as no impact, moderate impact, or severe impact.

Noise and vibration receptors include residences, businesses, and locations where noise sensitivities exist due to the types of land use or activities such as parks, picnic areas, recreation areas, schools, churches, libraries, and hospitals. Consequently, urban areas adjacent to rail ROW have more receptors than rural areas.

3.8.1 Methodology and Regulatory Requirements

FRA implemented Railroad Noise Emission Compliance Regulations (49 CFR 210) to comply with the Railroad Noise Emission Standards established by the USEPA in 40 CFR 201.

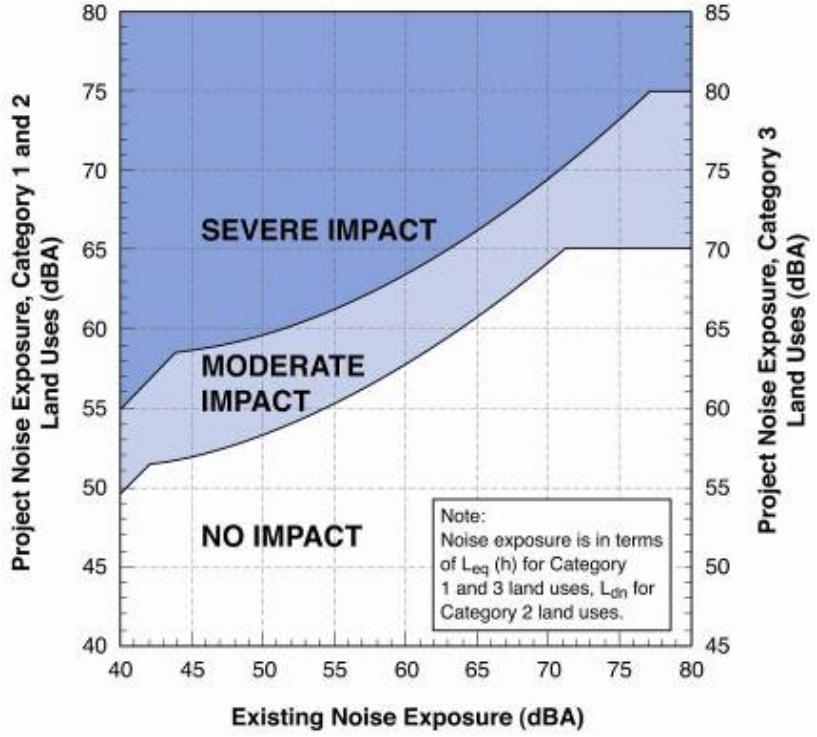
The noise and vibration assessment followed FTA guidelines published in "Transit Noise and Vibration Impact Assessment" (May 2006). The FRA published virtually identical guidance for assessing noise and vibration from high speed passenger trains in 2005. FRA uses FTA methods for noise and vibration impact assessment. Consistent with other FRA Tier 1 NEPA evaluations, a screening application of the general noise assessment was conducted, and a GBV assessment was prepared in accordance with FTA guidelines.

The FTA noise impact criteria are defined by two curves, representing severe and moderate noise impacts, which are defined below.

- **Severe Impact.** A significant percentage of people are highly annoyed by noise in this range. Noise mitigation would normally be specified for severe impact areas unless it is not feasible or reasonable (unless there is no practical method of mitigating the impact).

- **Moderate Impact.** In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. These factors include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

The FTA noise impact criteria are summarized in Graph 3.8-1, below. The figure illustrates existing noise exposure and Project-related noise exposure, and demonstrates that FTA noise impact thresholds vary with existing noise levels. Although the figure below references all three land use categories used by FTA, this analysis focused on Category 2 (land uses where overnight sleep occurs).



Graph 3.8-1. FTA Noise Impact Criteria

In a Tier 1 EIS, the focus is on receptors in land uses where overnight sleep occurs (primarily residences), which is consistent with FRA guidance for Tier 1 NEPA reviews. Residences were identified by visual inspection of digital aerial photographs; no windshield surveys were performed. Park and recreation areas identified through a separate analysis of those resources were also noted as receptor locations for the noise and vibration analysis.

Passenger trains would operate at the maximum authorized speed of 110 mph where and when possible, but sustained 110 mph stretches are not present on this route. The noise and vibration analyses evaluated average speeds that account for permanent speed reductions for curves, urban area ordinances, station stops, etc., and the speed loss that occurs when accelerating and decelerating out of and into each of those speed reductions. Freight trains have switching and other work events, and permanent speed restrictions for yard areas,

curves, and urban ordinances, etc. The noise and vibration analyses also evaluated average freight train speeds.

Two future scenarios were assessed for the effects of airborne noise and GBV. The first scenario is the expected effect of a future freight rail traffic increase, without the addition of the passenger trains from Chicago to Omaha, combined with current service levels of commuter rail traffic from Chicago to Wyanet. The second scenario is the expected effect of the same freight rail traffic increase and commuter rail traffic along with the Project-related passenger rail traffic from the Project. These are respectively referred to as the future/no-build scenario and the future/build scenario. Both of these scenarios were evaluated in order to assess the incremental, Project-related effects of airborne noise and GBV.

Data from several sources was used to generate train traffic counts on the proposed route for use in the noise and vibration assessment, including information from railroads, train traffic data from FRA crossing data, and operational data. The FRA grade crossing database was incorporated in this assessment to identify the locations of public at-grade rail crossings where locomotive horns are used, and also to identify where quiet zones exist. Noise from locomotive horn use was not included in this assessment in areas where quiet zones currently exist, because horns are not used in those zones.

Potential impacts of both airborne noise and GBV were assessed. FTA and FRA guidance for assessing noise and GBV from passenger trains were used in a screening application of FTA's general noise assessment methods. The FTA noise impact criteria were used to assess the potential for noise impacts. The screening application of the general noise assessment methods only identified potential noise impacts at residential lands; it did not distinguish between moderate and severe noise impacts (as defined by FTA and FRA).

Aerial photography was collected showing the existing land uses along the Study Area and existing noise levels were estimated along its route. Residential land uses were identified from aerial photography. Changes in train volumes (passenger and freight) were identified, and estimates for train volumes and average train speeds were developed. This information was used to subdivide the Study Area into sections with similar traffic conditions.

Existing noise levels in the Study Area were estimated using a multi-step process. Land uses along each section were evaluated to estimate development density, which was used to further subdivide the portions of the Study Area into areas of similar rail traffic volumes or "conditions," development density, and then existing noise levels or "noise conditions." Following FTA/FRA guidance, noise impact thresholds were then determined based on the existing noise levels. By objectively establishing traffic and noise "conditions" with corresponding noise impact thresholds, the process of evaluating project-related noise throughout the entire corridor was simplified. The traffic and noise "conditions" are discussed in more depth in the following section.

The FRA grade crossing database was used to identify at-grade crossings for the Study Area and to identify any quiet zones. Potential noise and GBV impacts were identified by plotting noise impact contours and identifying residential land uses (land use category 2) within those contours. No other land use category was included in the screening application of the general noise and GBV assessment methods. This methodology has been approved by FRA for use on Tier 1 NEPA assessments.

3.8.1.1 Noise

The first step in the noise assessment was to identify existing noise levels. This assessment used methods published by FTA (May 2006) to estimate existing noise levels based on factors such as proximity to roadways, highways, and railroads, and also by population density. Using FTA guidance, the highest estimate of existing noise levels produced by these methods was incorporated into this assessment. In accordance with FTA and FRA guidance, this assessment used the existing noise level to identify the noise impact threshold. The noise impact threshold was determined by locating the measured or estimated existing noise level in FTA's *Transit Noise and Vibration Impact Assessment – Final Report*, Table 3-4, which identifies noise impact thresholds corresponding to the existing noise levels (FTA, May 2006).

The range of train volumes and speeds present in the Study Area was summarized as a series of traffic conditions (A through J). Because sustained speeds of 110 mph would not be possible on the route, the noise and vibration analyses evaluated average speeds that account for permanent speed reductions for curves, urban area ordinances, station stops, etc., and the speed loss that occurs when accelerating and decelerating out of and into each of those speed reductions. Consequently, a speed of 100 mph was used to represent the maximum average speed of passenger trains. The noise and vibration analyses also evaluated average freight train speeds. This allowed the Corridor to be subdivided into sections with similar train traffic characteristics. A series of traffic conditions, or zones, were identified throughout the rail line; each traffic condition represents a range of similar rail traffic and surrounding land use (and existing noise levels). Assigning traffic conditions to the Study Area allowed it to be logically subdivided into subsections, simplifying the noise analysis. A total of ten traffic conditions were defined, as shown in Table 3.8-1. These "traffic conditions" were used only to facilitate the analysis; noise analysis results are reported by county and municipality.

Table 3.8-1. Summary of Traffic Conditions

Traffic Condition		Trains per Day	Average Train		
Designation	Location		No. of Cars	No. of Locomotives	Speed
		Future Freight Trains (Future/No-Build & Future/Build scenarios)			
A	Chicago-Aurora	60.0	105.0	3.0	45.0
B	Aurora-Wyanet	36.0	105.0	3.0	45.0
C	Wyanet-Silvis	14.0	141.4	3.0	35.0
D	Silvis-Rock Island	22.0	106.4	2.0	5.0
E	Rock Island-Iowa City	12.0	123.2	3.0	35.0
F	Iowa City	14.0	115.5	2.0	5.0
G	Iowa City-E. Des Moines	12.0	123.2	3.0	35.0
H	Des Moines	14.0	115.5	2.0	10.0
I	W. Des Moines-Council Bluffs	10.0	105.0	3.0	35.0
J	Council Bluffs-Omaha	90.0	141.4	3.0	10.0
		Chicago-area Passenger Trains (Future/No-Build scenario)			
A	Chicago-Aurora	102.0	9.0	1.0	60.0
B	Aurora-Wyanet	8.0	9.4	2.0	70.0
		Future Passenger Trains (Future/Build scenario)			
A	Chicago-Aurora	116.0	9.0	1.0	60.0
B	Aurora-Wyanet	22.0	8.0	2.0	100.0
C	Wyanet-Silvis	14.0	7.1	2.0	100.0
D	Silvis-Rock Island	14.0	7.1	2.0	40.0
E	Rock Island-Iowa City	14.0	7.1	2.0	100.0
F	Iowa City	14.0	7.1	2.0	40.0
G	Iowa City-E. Des Moines	14.0	7.1	2.0	100.0
H	Des Moines	14.0	7.1	2.0	40.0
I	W. Des Moines-Council Bluffs	14.0	7.1	2.0	100.0
J	Council Bluffs-Omaha	14.0	7.1	2.0	40.0

As discussed in the previous section, the range of development density present throughout the Study Area was simplified into the three land use categories used in the FRA horn noise model (rural, suburban, and urban). These particular land use categories were used because they are logical subdivisions of existing land use and they are consistent with land use categories used in the FRA horn noise model. The building-induced (acoustical) shielding assumptions used in that model for each respective land use were also incorporated into this analysis. A series of noise categories or "noise conditions" were then created by combining traffic conditions and the three categories of development density. Table 3.8-2 summarizes the Noise Condition definitions. Using this approach, the Study area was subdivided into the "noise conditions", and each noise condition was modeled for representative results throughout the Study Area. As noted previously, the noise analysis results were reported by county and municipality.

Table 3.8-2. Noise Condition Definitions

Noise Condition	Traffic Condition	Development Density
1	A	Urban
2	A	Suburban
3	B	Rural
4	B	Suburban
5	B	Urban
6	C	Rural
7	C	Suburban
8	D	Suburban
9	D	Urban
10	E	Rural
11	E	Suburban
12	E	Urban
13	F	Suburban
14	F	Urban
15	G	Rural
16	G	Suburban
17	H	Suburban
18	H	Urban
19	H	Rural
20	I	Rural
21	I	Suburban
22	J	Urban
23	J	Suburban

Using this approach, the moderate noise impact threshold was 59 dBA and the severe noise impact threshold was 62 dBA, both on a L_{dn} basis.

Based on the FRA database, this analysis assumes that a quiet zone exists between Chicago and Aurora. These portions of the Study Area comprise much of Noise Condition 1 and Noise Condition 2. Furthermore, most crossings appear to be grade-separated through Council Bluffs, Iowa to Omaha, Nebraska. This portion of the Study Area comprises Noise Condition 22. Horns are apparently not used on any Noise Condition 1, 2, or 22 rail sections; therefore, locomotive horn analyses were not performed for these sections.

The FRA locomotive horn noise model does not allow a modeler to model several different trains at the same time, and was therefore not used on this analysis. The horn noise contours were created using methods in the FTA and FRA guidance documents, and incorporating some of the features of the FRA horn noise model (the 1/4-mile contour distance, and the shielding equations).

3.8.1.2 Vibration

For the GBV assessment, the locations of existing vibration-sensitive land uses were identified and reviewed. In addition, the collected data regarding surface geology were reviewed for application to the assessment of vibration impacts.

Vibration impact assessments are based upon the highest expected level of vibration for repeated vibration events. The vibration impact criterion varies depending upon the number of vibration events per day; a greater number of vibration events will lower the threshold for expecting a community response to the vibration. The number of vibration events may range from less than 30 (infrequent) to more than 70 (frequent) events per day depending on location. FTA recommends, however, that the frequent-event criterion be applied for line-haul freight trains because of the lengthy vibration event caused by the rail cars and the greater weight and axle loads of freight trains versus passenger trains.

Both Future/No-build and Future/Build operations were evaluated to assess the potential vibration impact along the Study Area. The Future/Build scenario includes passenger trains moving at 100 mph, along with existing freight train traffic, on continuously welded rail (CWR).

The assessment began with a data gathering task and construction of a GIS database for the Project. The railroad alignments, surface geology, aerial photography, and train traffic data (the number of locomotives and rail cars) were among the critical information gathered. Geology sources included GIS data and maps available at the Illinois State Geological Survey, Iowa Geological Survey, and Nebraska Geological Survey websites. Appendix E includes data related to development of vibration curve adjustment factors used to support the vibration analysis. Train traffic data were compiled during the noise assessment. The traffic conditions developed for use in the noise assessment documented in the first part of this section were also applied in the vibration analysis. The traffic conditions provided in Table 3.8-3 is a condensed version of Table 3.8-2 for use in the vibration analysis.

As in the noise analysis, the vibration analysis also categorized sections of the rail line into "traffic conditions." These "traffic conditions" were used only to facilitate the analysis; vibration analysis results are reported by county and municipality. Table 3.8-3 refers to sections of rail that have specific combinations of train speed and frequency (although for the vibration assessment, the frequent-event criterion is assumed). Table 3.8-3 is a condensed version of Table 3.8-2 as it applies to the vibration analysis.

Table 3.8-3. Traffic Conditions

Traffic Condition	Location	Speed (mph)	
		Future/No-build	Future/Build
A	Chicago-Aurora	60	60
B	Aurora-Wyanet	70	100
C	Wyanet-Silvis	35	100
D	Silvis-Rock Island	5	40
E	Rock Island-Iowa City	35	100
F	Iowa City	5	40
G	Iowa City-E. Des Moines	35	100
H	Des Moines	10	40
I	W. Des Moines-Council Bluffs	35	100
J	Council Bluffs-Omaha	10	40

Once the necessary datasets had been gathered, the vibration impacts for existing and future scenarios were analyzed.

This Tier 1 NEPA vibration assessment only assessed Project-related ground-borne vibration at land uses where overnight sleep occurs (primarily residences) for the same reasons as noted in the noise section.

The quantitative noise assessment was completed using GIS data and by calculating the distance to Future/No-build and Future/Build train noise impact thresholds using FTA guidance. As noted above, noise levels calculated with this model were compared to FTA noise impact criteria to assess the potential for incremental increases in the number of train noise impacts. Similarly, the distance to Future/No-build and Future/Build vibration impact thresholds was calculated and plotted as GIS contours, and was used to identify the incremental change associated with the proposed Project.

3.8.2 Affected Environment

Various resources, including sensitive receptors such as residences, parks, and recreational areas, within the Study Area are shown in Appendix B, Figures 1 through 162. The current rail traffic, speed, and noise conditions were identified in Tables 3.8-1, -2, and -3.

3.8.3 Impacts of No-Build Alternative

Noise and vibration impacts were evaluated quantitatively and are reported separately below.

3.8.3.1 Noise

Using the same methods for estimating noise impacts under the Build Alternative, the noise impacts under the No-Build Alternative were also estimated in the future. Table 3.8-4 summarizes the noise impacts under the No-Build Alternative, and provides a context when reviewing noise impacts associated with the Build Alternative.

Table 3.8-4. Incremental Increase in Noise Impacts Associated with the No-Build Alternative

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Adair County					
Unincorporated	3	0	0	0	3
Adair County Total	**3**	**0**	**0**	**0**	**3**
Bureau County					
Arlington	3	0	0	0	3
Malden	3	0	0	0	3
Mineral	3	0	0	0	3
Princeton	3	0	0	1	4
Wyanet	5	0	0	0	5
Unincorporated	3	0	0	0	3
Bureau County Total	**20**	**0**	**0**	**1**	**21**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Cass County					
Anita	1	0	0	0	1
Atlantic	0	1	0	0	1
Wiota	0	0	1	0	1
Cass County Total	**1**	**1**	**1**	**0**	**3**
Cedar County					
Unincorporated	2	0	0	0	2
Cedar County Total	**2**	**0**	**0**	**0**	**2**
Cook County					
Berwyn	0	4	0	0	4
Brookfield	0	2	0	0	2
Chicago	0	3	0	0	3
Cicero	0	2	0	0	2
La Grange	0	2	0	0	2
Riverside	0	4	0	0	4
Western Springs	0	1	0	0	1
Cook County Total	**0**	**18**	**0**	**0**	**18**
Dallas County					
Dexter	0	0	1	0	1
Van Meter	0	1	0	0	1
Dallas County Total	**0**	**1**	**1**	**0**	**2**
DeKalb County					
Sandwich	11	3	0	0	14
Somonauk	6	0	0	0	6
Unincorporated	1	0	0	0	1
DeKalb County Total	**18**	**3**	**0**	**0**	**21**
Douglas County					
Omaha	0	2	0	0	2
Douglas County Total	**0**	**2**	**0**	**0**	**2**
DuPage County					
Clarendon Hills	0	6	0	0	6
Downers Grove	0	1	0	0	1
Hinsdale	0	2	0	0	2
Lisle	0	2	0	0	2
Naperville	0	3	0	0	3
Westmont	0	6	0	0	6
Unincorporated	0	1	0	0	1
DuPage County Total	**0**	**21**	**0**	**0**	**21**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Guthrie County					
Casey	0	0	1	0	1
Menlo	0	0	1	0	1
Stuart	1	0	0	0	1
Guthrie County Total	**1**	**0**	**2**	**0**	**3**
Henry County					
Annawan	5	0	0	0	5
Atkinson	4	1	0	0	5
Colona	13	5	0	0	18
Geneseo	8	0	0	0	8
Unincorporated	3	4	0	0	7
Henry County Total	**33**	**10**	**0**	**0**	**43**
Iowa County					
Ladora	2	0	2	0	4
Victor	1	0	0	0	1
Unincorporated	6	2	0	0	8
Iowa County Total	**9**	**2**	**2**	**0**	**13**
Jasper County					
Colfax	11	2	0	0	13
Kellogg	0	0	3	0	3
Newton	1	1	12	0	14
Unincorporated	9	1	0	0	10
Jasper County Total	**21**	**4**	**15**	**0**	**40**
Johnson County					
Coralville	0	1	0	0	1
Iowa City	7	29	0	1	37
Oxford	2	0	1	0	3
Tiffin	2	5	2	0	9
University Heights	0	3	0	0	3
Unincorporated	1	0	0	0	1
Johnson County Total	**12**	**38**	**3**	**1**	**54**
Kane County					
Aurora	0	2	0	0	2
Montgomery	2	0	0	0	2
Kane County Total	**2**	**2**	**0**	**0**	**4**
Kendall County					
Plano	0	1	0	0	1
Unincorporated	1	0	0	0	1
Kendall County Total	**1**	**1**	**0**	**0**	**2**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
LaSalle County					
Earlville	4	0	0	0	4
Leland	1	0	0	0	1
Mendota	3	4	0	0	7
Unincorporated	3	1	0	0	4
LaSalle County Total	**11**	**5**	**0**	**0**	**16**
Madison County					
Earlham	0	0	1	0	1
Unincorporated	1	0	0	0	1
Madison County Total	**1**	**0**	**1**	**0**	**2**
Muscatine County					
Atalissa	1	0	2	0	3
Stockton	4	0	0	0	4
West Liberty	4	0	0	0	4
Wilton	6	1	0	0	7
Unincorporated	7	1	0	0	8
Muscatine County Total	**22**	**2**	**2**	**0**	**26**
Polk County					
Altoona	1	0	0	0	1
Des Moines	3	3	0	0	6
Mitchellville	17	2	0	0	19
West Des Moines	5	0	0	0	5
Polk County Total	**26**	**5**	**0**	**0**	**31**
Pottawattamie County					
Council Bluffs	0	2	0	0	2
McClelland	2	0	0	0	2
Unincorporated	2	1	1	0	4
Pottawattamie County Total	**4**	**3**	**1**	**0**	**8**
Poweshiek County					
Brooklyn	0	0	1	0	1
Grinnell	0	0	6	0	6
Malcom	0	0	2	0	2
Victor	0	0	1	0	1
Unincorporated	1	0	0	0	1
Poweshiek County Total	**1**	**0**	**10**	**0**	**11**
Rock Island County					
East Moline	5	0	0	0	5
Moline	7	0	0	0	7
Rock Island	2	0	0	0	2
Silvis	1	0	0	0	1
Rock Island County Total	**15**	**0**	**0**	**0**	**15**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Scott County					
Davenport	10	4	0	0	14
Scott County Total	**10**	**4**	**0**	**0**	**14**
Grand Totals	**213**	**122**	**38**	**2**	**375**
	335		**40**		

Table 3.8-4 shows noise impacts sorted by grade crossing (due to locomotive horn use) and wayside noise (wheel-rail noise), and both moderate and severe. Under the future No-Build Alternative only 335 moderate and 40 severe noise impacts are estimated to occur along the approximately 500 mile corridor. Under the No-Build Alternative, the Project would not be built, and noise and vibration impacts are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities service would contribute to slightly increased noise and vibration along this portion of the Chicago to Omaha route.

3.8.3.2 Vibration

Projected No-Build rail traffic was assessed to identify the incremental increase in ground-borne vibration effects on residential land uses in the Study Area. Table 3.8-5 presents the vibration impacts associated with the No-Build Alternative.

Table 3.8-5. Incremental Increase in Ground-borne Vibration Impacts Associated with the No-Build Alternative

County	Municipality	No. of Impacts
Adair County	Adair	0
	Stewart	0
	Unincorporated	0
	Adair County Total	**0**
Bureau County	Arlington	4
	Malden	3
	Mineral	2
	Princeton	6
	Wyanet	6
	Unincorporated	2
	Bureau County Total	**23**
Cass County	Atlantic	1
	Cass County Total	**1**
Cedar County		No change
Cook County	Berwyn	4
	Brookfield	2
	Chicago	3
	Cicero	2
	La Grange	2
	Riverside	4
	Western Springs	1
	Cook County Total	**18**

County	Municipality	No. of Impacts
Dallas County	Van Meter	1
	Dallas County Total	**1**
DeKalb County	Sandwich	17
	Somonauk	7
	Unincorporated	1
	DeKalb County Total	**25**
Douglas County		No change
DuPage County	Clarendon Hills	6
	Downers Grove	1
	Hinsdale	2
	Lisle	7
	Naperville	7
	Westmont	6
	Unincorporated	5
	DuPage County Total	**34**
Guthrie County		No change
Henry County	Annawan	2
	Atkinson	3
	Colona	12
	Geneseo	6
	Unincorporated	4
	Henry County Total	**27**
Iowa County	Unincorporated	1
	Iowa County Total	**1**
Jasper County		No change
Johnson County	Iowa City	7
	Johnson County Total	**7**
Kane County	Aurora	15
	Montgomery	4
	Unincorporated	3
	Kane County Total	**22**
Kendall County	Montgomery	1
	Plano	4
	Unincorporated	9
	Kendall County Total	**14**
LaSalle County	Earlville	6
	Leland	2
	Mendota	11
	Unincorporated	4
	LaSalle County Total	**23**
Madison County		No change
Muscatine County		No change
Polk County	West Des Moines	1
	Polk County Total	**1**
Pottawattamie County	Council Bluffs	2
	Pottawattamie County Total	**2**
Poweshiek County		No change
Rock Island County		No change
Scott County	Davenport	3
	Scott County Total	**3**
Total Vibration Impacts		**202**

The overall number of projected vibration impacts under the No-Build Alternative is quite low, and not considered to be significant.

3.8.4 Impacts of Build Alternative

Noise and vibration impacts were evaluated quantitatively and are reported separately below.

3.8.4.1 Noise

Both the Future/No-build and Future/Build (seven round-trips per day) passenger rail traffic were assessed; this allowed the analysis to identify the incremental increase in train noise effects on residential land uses in the Study Area reported in the sections below. This portion of the analysis is based on the proposed addition of seven round-trips per day at 100 mph from Chicago to Omaha.

Table 3.8-6 presents the incremental increase in noise impacts, as defined by FTA, at residential land uses adjacent to the Study Area. The table presents noise impacts predicted to occur in each municipality along the Build Alternative, and sorts the impacts as moderate or severe grade crossing and wayside (wheel/rail) noise impacts. The entire Corridor was evaluated; rural areas are listed as unincorporated in the table.

Table 3.8-6 shows that the distribution of Project-related noise impacts is scattered throughout the Corridor. Areas with high existing traffic volumes and quiet zones are expected to experience a minor incremental increase in train noise associated with the Build Alternative. Conversely, areas with low existing traffic volumes, slow trains, and fewer or no quiet zones are expected to experience a larger incremental increase in train noise associated with the Build Alternative.

Table 3.8-6 reflects the trend of a low incremental increase in noise impacts in Chicago where train volumes are already high but much of the area along the Build Alternative consists of a quiet zone. Analysis results show that municipalities in the Quad Cities, where train speeds and volumes are low and quiet zones do not exist, are likely to experience a larger incremental increase in train noise levels and corresponding impacts associated with the Build Alternative. The influence of quiet zones on the magnitude of the incremental increase in train noise impacts suggests they represent an opportunity to mitigate many of the predicted impacts. Mitigation opportunities are discussed in Section 3.8.5.

Table 3.8-6. Incremental Increase in Noise Impacts Associated with the Build Alternative

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Adair County					
Adair	0	2	0	0	2
Stuart	7	0	0	0	7
Unincorporated	0	0	3	0	3
Adair County Total	**7**	**2**	**3**	**0**	**12**
Bureau County					
Arlington	0	0	3	0	3
Malden	0	0	3	0	3
Mineral	1	0	3	0	4
Princeton	3	0	2	1	6
Sheffield	10	0	0	0	10
Wyanet	0	0	5	0	5
Unincorporated	0	1	2	1	4
Bureau County Total	**14**	**1**	**18**	**2**	**35**
Cass County					
Anita	2	2	1	0	5
Atlantic	3	2	0	1	6
Wiota	3	0	0	0	3
Unincorporated	1	0	0	0	1
Cass County Total	**9**	**4**	**1**	**1**	15
Cedar County					
Durant	14	0		0	14
Unincorporated	8	1	2	0	11
Cedar County Total	**22**	**1**	**2**	**0**	**25**
Cook County					
Berwyn	0	2	0	4	6
Brookfield	0	2	0	2	4
Chicago	0	19	0	3	22
Cicero	0	3	0	2	5
La Grange	0	2	0	2	4
Riverside	0	1	0	4	5
Western Springs	0	0	0	1	1
Cook County Total	**0**	**29**	**0**	**18**	**47**
Dallas County					
De Soto	3	2	0	0	5
Dexter	10	0	0	0	10
Van Meter	3	1	0	1	5
Unincorporated	6	2	0	0	8
Dallas County Total	**22**	**5**	**0**	**1**	**28**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
DeKalb County					
Sandwich	0	0	11	3	14
Somonauk	0	0	6	0	6
Unincorporated	0	0	1	0	1
DeKalb County Total	**0**	**0**	**18**	**3**	**21**
Douglas County					
Omaha	0	25	0	2	27
Unincorporated	0	1	0	0	1
Douglas County Total	**0**	**26**	**0**	**2**	**28**
DuPage County					
Clarendon Hills	0	0	0	6	6
Downers Grove	0	8	0	1	9
Hinsdale	0	4	0	2	6
Lisle	0	3	0	2	5
Naperville	0	2	0	3	5
Westmont	0	0	0	6	6
Unincorporated	0	3	0	1	4
DuPage County Total	**0**	**20**	**0**	**21**	**41**
Guthrie County					
Casey	8	1	0	0	9
Menlo	8	0	0	0	8
Stuart	5	0	1	0	6
Unincorporated	1	2	0	0	3
Guthrie County Total	**22**	**3**	**1**	**0**	**26**
Henry County					
Annawan	3	0	5	0	8
Atkinson	3	0	4	1	8
Colona	0	0	12	6	18
Geneseo	16	0	8	0	24
Unincorporated	2	5	3	4	14
Henry County Total	**24**	**5**	**32**	**11**	**72**
Iowa County					
Ladora	7	1	2	0	10
Victor	2	0	1	0	3
Unincorporated	15	2	6	2	25
Iowa County Total	**24**	**3**	**9**	**2**	**38**
Jasper County					
Colfax	0	3	11	2	16
Kellogg	13	2	0	0	15
Newton	31	0	0	0	31
Unincorporated	4	0	9	1	14
Jasper County Total	**48**	**5**	**20**	**3**	**76**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Johnson County					
Coralville	1	0	0	0	1
Iowa City	7	0	3	26	36
Oxford	4	0	1	0	5
Tiffin	5	0	0	1	6
University Heights	0	0	0	2	2
Unincorporated	3	1	1	0	5
Johnson County Total	**20**	**1**	**5**	**29**	**55**
Kane County					
Aurora	0	11	0	2	13
Montgomery	1	0	2	0	3
Unincorporated	0	3	0	0	3
Kane County Total	**1**	**14**	**2**	**2**	**19**
Kendall County					
Montgomery	0	1	0	0	1
Plano	9	1	0	1	11
Unincorporated	3	6	1	0	10
Kendall County Total	**12**	**8**	**1**	**1**	**22**
LaSalle County					
Earlville	2	0	4	0	6
Leland	1	0	1	0	2
Mendota	4	0	3	3	10
Unincorporated	0	0	3	1	4
LaSalle County Total	**7**	**0**	**11**	**4**	**22**
Madison County					
Earlham	9	1	0	0	10
Unincorporated	0	1	1	0	2
Madison County Total	**9**	**2**	**1**	**0**	**12**
Muscatine County					
Atalissa	5	0	1	0	6
Stockton	0	0	4	0	4
West Liberty	2	1	4	0	7
Wilton	5	0	6	0	11
Unincorporated	3	4	7	0	14
Muscatine County Total	**15**	**5**	**22**	**0**	**42**

Municipality	Moderate		Severe		Total
	Grade Crossing	Wayside	Grade Crossing	Wayside	
Polk County					
Altoona	3	0	0	0	3
Des Moines	6	3	3	3	15
Mitchellville	9	0	17	0	26
Pleasant Hill	7	1	0	0	8
West Des Moines	2	4	5	0	11
Unincorporated	2	0	0	0	2
Polk County Total	**29**	**8**	**25**	**3**	**65**
Pottawattamie County					
Council Bluffs	2	10	0	2	14
McClelland	5	0	2	0	7
Unincorporated	2	2	2	1	7
Pottawattamie County Total	**9**	**12**	**4**	**3**	**28**
Poweshiek County					
Brooklyn	5	0	0	0	5
Grinnell	24	0	0	0	24
Malcom	3	0	0	0	3
Victor	2	0	0	0	2
Unincorporated	1	3	1	0	5
Poweshiek County Total	**35**	**3**	**1**	**0**	**39**
Rock Island County					
Carbon Cliff	0	1	0	0	1
East Moline	1	0	5	0	6
Moline	0	0	7	0	7
Rock Island	0	0	2	0	2
Silvis	1	0	1	0	2
Rock Island County Total	**2**	**1**	**15**	**0**	**18**
Scott County					
Davenport	0	24	10	4	38
Walcott	13	0	0	0	13
Unincorporated	2	0	0	0	2
Scott County Total	**15**	**24**	**10**	**4**	**53**
Grand Totals	**346**	**182**	**201**	**110**	**839**
	528		**311**		

Analysis results show a low incremental increase in noise impacts per mile associated with the Build Alternative. The Build Alternative is projected to result in 1.0 new moderate noise impact per mile; 0.6 new severe noise impact per mile, and a combined total of 1.6 noise impacts per mile over approximately 500 miles. On this basis, the incremental increase in train noise is not significant.

Analysis results also show that 375 noise impacts are projected to occur under the No-Build Alternative and 839 noise impacts are projected to occur under the Build Alternative. This is an increase of over 100 percent, and is spread throughout the corridor. Of these impacts, 209 are changes from moderate to severe (the Build Alternative introduces two new severe noise impacts at locations that were previously not impacted).

Of the noise impacts predicted to occur under the Build Alternative, 547 of them are attributed to locomotive horn use, and they occur in areas where locomotive horns are currently in use (with many of them occurring under the No-Build Alternative). As noted under the No-Build Alternative, the analysis does not account for any change in at-grade intersections to grade-separated intersections where horns would not be required. Implementing quiet zones has the potential to further reduce these impacts. Because of the preliminary nature of this Tier 1 analysis and the acknowledgement that upgrade of some at-grade intersections would be known during Tier 2, these grade-crossing impacts are not considered significant. The remaining 292 noise impacts attributable to the Build Alternative are associated with wayside noise and are spread throughout the corridor (equivalent to less than one noise impact per mile), which makes mitigation challenging and potentially impractical in some areas based on the consideration of feasibility and reasonableness of noise barriers for a few receptors. Because of the limited number of noise impacts per mile, these impacts are also not considered significant.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.8.4.2 Vibration

The Future/Build (seven round-trips per day) rail traffic was assessed; this allowed the analysis to identify the incremental increase in ground-borne vibration effects on residential land uses in the Study Area.

Table 3.8-7 presents the incremental increase in vibration impacts, as defined by FTA, at residential land uses adjacent to the Study Area. The table presents vibration impacts predicted to occur in each municipality along the Build Alternative. There would be no incremental increase in vibration impacts for Cook and DuPage counties.

Table 3.8-7. Incremental Increase in Ground-borne Vibration Impacts Associated with the Build Alternative

County	Municipality	No. of Impacts
Adair County	Adair	4
	Stewart	16
	Unincorporated	3
	Adair County Total	**23**
Bureau County	Arlington	11
	Malden	14
	Mineral	41
	Princeton	45
	Sheffield	44
	Wyanet	38
	Unincorporated	17
	Bureau County Total	**210**
Cass County	Anita	7
	Atlantic	19
	Wiota	4
	Unincorporated	3
	Cass County Total	**33**
Cedar County	Durant	42
	Unincorporated	10
	Cedar County Total	**52**
Cook County		No changes
Dallas County	De Soto	9
	Dexter	25
	Van Meter	17
	Unincorporated	17
	Dallas County Total	**68**
DeKalb County	Sandwich	61
	Somonauk	61
	Unincorporated	7
	DeKalb County Total	**129**
Douglas County	Omaha	15
	Douglas County Total	**15**
DuPage County		No changes
Guthrie County	Casey	7
	Menlo	20
	Stuart	18
	Unincorporated	5
	Guthrie County Total	**50**
Henry County	Annawan	71
	Atkinson	45
	Colona	96
	Geneseo	144
	Unincorporated	49
	Henry County Total	**405**
Iowa County	Ladora	54
	Marengo	2
	Victor	37
	Unincorporated	49
	Iowa County Total	**142**

County	Municipality	No. of Impacts
Jasper County	Colfax	54
	Kellogg	29
	Mitchellville	1
	Newton	119
	Unincorporated	48
	Jasper County Total	**251**
Johnson County	Coralville	13
	Iowa City	166
	Oxford	25
	Tiffin	42
	University Heights	23
	Unincorporated	15
	Johnson County Total	**284**
Kane County	Aurora	244
	Montgomery	34
	Unincorporated	1
	Kane County Total	**279**
Kendall County	Oswego	23
	Plano	113
	Unincorporated	64
	Kendall County Total	**200**
LaSalle County	Earlville	6
	Leland	2
	Mendota	11
	Unincorporated	4
	Total	**23**
Madison County		No change
Muscatine County		No change
Polk County	West Des Moines	1
	Total	**1**
Pottawattamie County	Council Bluffs	2
	Total	**2**
Poweshiek County		No change
Rock Island County		No change
Scott County	Davenport	3
	Total	**3**
Total Vibration Impacts		**202**

The vibration analysis identified approximately 7 vibration impacts per mile associated with the Build Alternative. Analysis results indicate that ground-borne vibration impacts occur when train speeds reach 100 mph. The Project proposes to introduce 7 round-trip trains at up to a maximum speed of 110 mph each day. Therefore there would be 14 train pass-by events per day at this speed. Analysis results also show that the number of vibration impacts in each municipality is related to the density of residential development in areas adjacent to the rail line. In some areas of the Corridor, the magnitude of Project-related vibration impacts is greater than in other areas. On a Project-wide basis, 7 additional vibration impacts (due to 14 daily pass-by events) per mile are not considered significant. However, the number of vibration impacts is projected to dramatically increase in more densely populated portions of the study area, particularly where train speeds may reach 100 mph. The magnitude of the

incremental increase in vibration impacts attributable to the Project is considered to be significant.

Table 3.8-8 presents a simple comparison of vibration impact contour distances for existing conditions, No-Build future conditions and 100 mph train service.

Table 3.8-8. Distances to Category 2 Ground-Borne Vibration Impacts

Scenario	GBV Impact Level (VdB)	Distance to Impact Level (ft)									
		Traffic Cond. A	Traffic Cond. B	Traffic Cond. C	Traffic Cond. D	Traffic Cond. E	Traffic Cond. F	Traffic Cond. G	Traffic Cond. H	Traffic Cond. I	Traffic Cond. J
Existing	72	475	495	230	50	140	17.5	140	42	140	51
Future/No-Build	72	475	495	230	50	140	17.5	140	42	140	51
Future/Build	72	475	660	540	320	335	155	335	155	335	184

As expected, as the train speed increases, the distance to the ground-borne vibration impact contour also increases (Appendix B, Figures 1 through 162 show vibration contours relative to buildings and other features). Areas outside of, or beyond the vibration impact contour are predicted to experience train-induced ground-borne vibration levels below the FTA/FRA vibration impact threshold. Generally, the Future/No-build trains will not travel at different speeds than the existing train traffic, and individual vibration events are therefore calculated to be equal in magnitude. Traffic condition A represents the portion of Chicago where the speed of the Future/Build trains does not increase from the Future/No-build trains, therefore the vibration impact distance does not change.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for vibration impacts would be less during the initial implementation phase. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.8.5 Potential Mitigation Measures

As shown above, the presence or absence of quiet zones has a great effect on the predicted number of train noise impacts. Locomotive horn use at public at-grade crossings causes the majority of the predicted noise impacts. Therefore, minimizing locomotive horn use in the Study Area represents the greatest opportunity to mitigate potential Project-related noise impacts. The Project would upgrade some electronic circuitry through installation of constant time circuitry (warning lights) at public at-grade roadway-rail crossings. In effect, the Project would install the electronic infrastructure for quiet zones. Municipalities predicted to

experience an increase in train noise impacts can choose to initiate the process of developing quiet zones, to take advantage of the infrastructure provided by the proposed Project.

The introduction of trains with speeds up to 110 mph in the study area has potential to cause a significant amount of ground-borne vibration, particularly in urban areas where population density is greatest. During the Tier 2 NEPA process, measures to mitigate ground-borne vibration would be evaluated and implemented to reduce the potential vibration impacts. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.9 AIR QUALITY

Air quality refers to the condition of the surrounding air in relation to the source and amount of pollutant emissions.

3.9.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to air quality is the Clean Air Act of 1970 (as amended) (CAA). Primary and secondary National Ambient Air Quality Standards (NAAQS) established by the CAA will be used as a basis for the review of potential air quality impacts.

Coordination has taken place with the USEPA, the Iowa Department of Natural Resources (Iowa DNR), the Illinois Environmental Protection Agency (Illinois EPA), and the Air Quality Division of the Nebraska Department of Environmental Quality (NDEQ). Published data regarding the air quality status of each county in the Study Area were gathered. These data pertain to criteria air pollutant levels as compared to NAAQS, and each county has been designated under a status of attainment, nonattainment, or maintenance.[4]

USEPA regulates air pollution in accordance with primary and secondary NAAQS established by the CAA, as amended. Iowa DNR, Illinois EPA and NDEQ regulate air pollutants and operate air monitors throughout each state. Illinois developed Illinois Ambient Air Quality Standards that are similar to the NAAQS. Iowa and Nebraska use the NAAQS to measure air quality. The NAAQS currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter (PM), and sulfur dioxide (SO_2). Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM-10) and smaller than 2.5 microns in diameter (PM-2.5). Most O_3 forms as a result of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) reacting with sunlight. Areas of the country where air pollution levels persistently exceed the NAAQS are designated as nonattainment areas.

[4] Attainment - meets national air quality standards. Nonattainment - does not meet national air quality standards and mitigation measures are being utilized. Maintenance – is close to national air quality thresholds and steps are being taken to reduce concentration of pollutants.

FRA, in coordination with USEPA, must make a determination that a federal action conforms to one or more applicable state implementation plans (SIPs) to achieve attainment of the NAAQS. General conformity emissions thresholds, defined in 40 CFR 51, Subpart W, are defined by the nonattainment or maintenance status for each criteria pollutant in the Study Area. If emissions from an action are below these thresholds, conformity analysis is not required. The applicable *de minimis* thresholds are as follows:

- O_3, 100 tons per year of either NO_x or VOC
- Pb, 25 tons per year
- PM-2.5, 100 tons per year
- PM-10, 100 tons per year

In addition to the criteria air pollutants for which there are NAAQS, USEPA also regulates air toxics. Many air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as airplanes or locomotives), and stationary sources (such as factories or refineries). Mobile Source Air Toxics (MSATs) are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Research into the health impacts of MSATs is ongoing; USEPA is in the process of assessing the risks of various kinds of exposures to these pollutants.

Emissions of air toxics from diesel locomotive engines are expected to be measured as a subset of either PM and/or hydrocarbons (HC). USEPA has established emission standards for these pollutants for newly manufactured and remanufactured locomotives.

These standards are dependent on the date a locomotive is first manufactured; the most stringent set of standards applies to locomotives originally manufactured in 2015 and later. The vast majority of PM emitted by locomotive diesel engines is in the form of PM-10. USEPA is projecting that the PM-10 and HC emissions from the national passenger locomotive fleet are already on an accelerating downward trend, and will continue to drop as a result of USEPA's emissions standards.

3.9.2 Affected Environment

The existing general air quality of the counties in the Study Area has been reviewed to assess if any of the counties are currently in nonattainment or maintenance for criteria pollutants. Table 3.9-1 identifies those counties currently designated as nonattainment or maintenance areas by USEPA (USEPA, 2012). Lead is not considered in the conformity analyses found later in this section because no transportation modes considered emit lead from operation.

Table 3.9-1. Nonattainment and Maintenance Areas within the Project Area

Criteria Pollutants	County	State	Status
Particulate matter less than 10 microns in diameter (PM-10)	Cook County – Lyons Township and Southeast Chicago	IL	Maintenance
	LaSalle County - Oglesby	IL	Maintenance
Particulate matter less than 2.5 microns in diameter (PM-2.5)	Cook County	IL	Nonattainment
	DuPage County	IL	Nonattainment
	Kane County	IL	Nonattainment
	Kendall County	IL	Nonattainment
8-hour ozone (O3)	Cook County	IL	Maintenance
	DuPage County	IL	Maintenance
	Kane County	IL	Maintenance
	Kendall County	IL	Maintenance
Lead (Pb)	Cook County	IL	Nonattainment
	Pottawattamie County	IA	Nonattainment

Source: USEPA, 2012

3.9.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on air quality are not anticipated beyond those that could occur due to other projects. Over time, air quality would worsen as vehicle congestion increases on the roads and highways between Chicago and Omaha. Specific quantitative impacts or benefits on air quality from the Chicago to Quad Cities service would be determined as that project progresses through its required Tier 2 NEPA documentation.

3.9.4 Impacts of Build Alternative

Table 3.9-2 shows the pollutants evaluated under the general conformity analysis for the Build Alternative. Emissions are estimated for the year 2020 based on ridership forecasts for that year. This analysis includes the assessment of air quality impacts of the Build Alternative in counties which currently qualify as maintenance or nonattainment. All counties which qualify as maintenance or nonattainment for emissions evaluated in the operational analysis are in the Chicago area.

Along the Corridor, there would be a reduction in all types of emissions except NO_x emissions, which would increase slightly due to the additional diesel fuel burned as a result of the increase in passenger train traffic by switching passengers from auto to rail. The slight increase in NO_x emissions would occur because of the diversion of passengers from other travel modes through use of enhanced and increased passenger rail service. The net change in emissions calculated below is a result of utilizing the travel demand model information and USEPA guidance for emissions factors, based upon travel mode. Calculations are shown in Appendix F, and trip diversion and ridership information can be found in Section 3.1.4. This general conformity analysis would need to be verified in the Tier 2 NEPA analyses. Construction-related emissions may also be addressed during Tier 2 analyses.

Table 3.9-2. Summary of General Conformity Determination for the Build Alternative (2020)

Pollutant	Route Miles in Area	De Minimis Threshold	Train Emissions Increase				Net Emissions Change
			Cook County	DuPage County	Kane County	Kendall County	
HC	55.60	100.00	2.44	2.69	0.91	2.13	-11.70
NO_X	55.60	100.00	55.08	60.72	20.57	48.11	22.55
PM-10	4.00	100.00	0.34	N/A	N/A	N/A	-0.07
PM-2.5	55.60	100.00	1.39	1.53	0.52	1.21	-1.97

Notes:

All numbers are in tons per year. Net Emissions Change includes reduction in passenger vehicles, bus, and plane emissions from trips diverted to trains based upon AECOM's Ridership, Diversion, and Mode Split Forecasts. Ridership used for the emissions analysis was the low range of the estimate. The Chicago nonattainment area includes the counties and townships listed in Table 1. PM-10 is listed for 4 route miles because the area of concern for nonattainment is only the area of Lyons Township in the Chicago Area.

Because this alternative includes new train service, impacts from the Build Alternative on air quality are unavoidable. However, overall emissions would be less because this additional rail service is replacing passenger vehicles, bus, and plane trips along a similar route, and trains produce fewer emissions per passenger then other modes of transportation.

As shown in Table 3.9-3, operation of the Build Alternative would directly impact the air quality by increasing NO_X emissions to 283 tons/year and the CO emissions reduction to 15,824 tons/year. There would also be a reduction in HC emissions totaling 95 tons/year and a reduction in SO_2 emissions of approximately 1.8 tons/year.

Table 3.9-3. Build Alternative – 2020 Estimated Changes in Air Pollutants from Diversion of Passenger Vehicle, Bus and Plane Trips (Tons per Year)

	Additional Train Emissions	Reduction in Emissions			Net Change
		Vehicles	Buses	Planes	
HC	73.46	122.89	45.47	0.56	(95.47)
CO	482.53	962.76	365.51	3.55	(849.30)
NO_X	1,659.08	991.58	373.35	11.37	282.78
PM-10	43.06	48.85	18.52	0.00	(24.31)
PM-2.5	41.77	40.60	15.69	0.00	(14.52)
SO_2	1.22	2.05	0.69	0.32	(1.84)
CO_2	128,663.26	106,108.24	35,804.25	2,574.83	(15,824.05)

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements, the slower passenger train speeds, and fewer diverted trips from other modes of transportation would cause less reduction in emissions than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the impacts on air quality would be less beneficial during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with

subsequent implementation phases, more benefits to air quality would occur to areas within or adjacent to the Potential Impact Area.

3.9.5 Potential Mitigation Measures

As a result of this Tier 1 analysis, mitigation such as converting fleet vehicles from diesel fuel to alternative fuels may be required for NO_x emissions, due to its output being above the *de minimis.* All other emissions are below their *de minimis* thresholds; as demonstrated in Table 3.9-3 for the Build Alternative. General air quality conformity analysis modeling may be required in Tier 2 NEPA documents to verify these findings. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.10 HAZARDOUS WASTE AND WASTE DISPOSAL

This resource includes hazardous materials and waste sites, either from the presence of stored materials or due to past spills or leaks.

3.10.1 Methodology and Regulatory Requirements

The regulatory framework governing activities potentially affecting hazardous materials and waste sites include the Toxic Substances Control Act (TSCA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, RCRA, the Superfund Amendments and Reauthorization Act (SARA), and the Emergency Planning and Community Right-to-Know Act (EPCRA). USEPA is the federal agency overseeing hazardous waste management. State agencies' regulatory frameworks include the Illinois EPA's Hazardous Waste Program (Title 35 Ill. Administration Code, Parts 700-739), the Iowa DNR's Hazardous Waste Remedial Fund and Sites Registry (under Sections 455B.424, 455B.426 and 455B.427 of the Code of Iowa), and NDEQ's Title 128, Nebraska Hazardous Waste Regulations.

Data were gathered from USEPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) list of final National Priorities List (NPL) hazardous material sites (USEPA, 2012a, b, c, and d). According to the USEPA, the NPL is "…a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States…"[5] The NPL list includes Superfund sites, which can pose a severe contamination risk or threat to public health and/or the environment. Data from USEPA's Facility Registry System (FRS) were also gathered; these data include other less severe sites (not on the NPL list) that store or generate hazardous materials. Some of the non-NPL sites are described as "brownfield" sites, which are lands that are contaminated because they were previously used for industrial or certain commercial uses, but have the potential to be reused or redeveloped once they are appropriately cleaned up. Data for non-NPL sites in Iowa were supplemented with data that were gathered by Iowa DOT. Data were compiled for leaking underground storage tank (LUST) locations using the Illinois EPA, Iowa DNR, and NDEQ websites. Data for waste

[5] USEPA NPL website: http://www.epa.gov/superfund/sites/npl/index.htm. Retrieved on May 31, 2012.

water treatment facilities were compiled from the FRS, Iowa DOT data, and aerial photography. In addition, Illinois EPA, Iowa DNR, and NDEQ websites were reviewed for locations of municipal landfills.

The data gathered for hazardous material and waste sites were reviewed, and a general description of those areas was prepared. A hazardous material or waste is any chemical, biological, or physical substance (liquid, solid, gas, or sludge) that can be potentially harmful to public health or the environment. Hazardous materials or wastes can be substances such as solvents, pesticides, or discarded commercial, industrial, or medical waste.

3.10.2 Affected Environment

The hazardous material and waste sites near or within the Study Area are shown in Appendix B, Figures 1 through 162.

Based on the hazardous materials and waste sites data, it was determined that there are no NPL (Superfund) sites located within or adjacent to the Study Area in Illinois. However, there are two NPL sites within the Study Area in Iowa, and one in Nebraska:

- The *Des Moines TCE (Trichloroethylene) Site*[6] (Appendix B, Figure 116) encompasses approximately 200 acres and is located in the south central portion of the City. The site was listed because of VOC contamination in the groundwater, caused by solvents and other activities conducted for pesticide and herbicide formulation. Clean-up has taken place, and remedial activities include continuing groundwater monitoring by Iowa DNR.[7]
- The *Railroad Avenue Groundwater Contamination Site* (Appendix B, Figure 117) is approximately 1,000 acres located in West Des Moines. The description of a portion of this site within the Study Area includes each side of Railroad Avenue west of 1st Street, which is directly adjacent to the north and south sides of the Study Area. The site was listed because of VOC contamination in municipal water wells and the groundwater, and remedial activities have taken place.[8]
- The *Omaha Lead Site* (Appendix B, Figure 162) includes contaminated surface soils on properties in the city of Omaha, Nebraska, that have been contaminated as a result of historic air emissions from lead smelting/refining operations. The total area of the site is approximately 20 square miles and encompasses the eastern portion of the greater metropolitan area. Facilities released lead-containing particulates into the atmosphere through smokestacks and other processes. The pollutants were transported downwind in various directions and deposited on the ground surface. Surface water and groundwater are not affected by the lead-contaminated soils of the site.

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6 USEPA. Envirofacts. CERCLIS Search Results. *Des Moines TCE - Site Description*. http://oaspub.epa.gov/enviro/cerclisquery.description_report?pgm_sys_id=IAD980687933.

7 USEPA. Envirofacts. CERCLIS Search Results. *Railroad Avenue Groundwater Contamination - Site Description*. http://oaspub.epa.gov/enviro/cerclisquery.description_report?pgm_sys_id=IA0001610963.

8 USEPA. Envirofacts. CERCLIS Search Results. *Omaha Lead Site - Site Description* http://iaspub.epa.gov/enviro/fii_query_dtl.disp_program_facility?pgm_sys_id_in=NESFN0703481&pgm_sys_acrnm_in=CERCLIS.

Other less severe (non-NPL) hazardous material sites within the Study Area include industrial facilities dealing with plastics, metals, agricultural products, and building materials; and commercial sites such as automotive repair/maintenance facilities, dry cleaners, and petroleum companies. There are several non-NPL hazardous material sites within the Study Area including 73 in Illinois, 84 in Iowa, and 7 in Nebraska. The facility names and general locations of these sites are shown in Appendix G, Tables 1, 2, and 3. Some of the non-NPL sites are brownfield sites. The current lists of municipal landfills indicate that there are no landfills located within the Study Area, with the exception of the former Tuttle Street Landfill site listed above as part of the Des Moines TCE NPL site.

The state listings of LUST sites within the Study Area include 219 in Illinois, 116 in Iowa, and 73 in Nebraska.

The Study Area contains 21 municipal or industrial waste water treatment facilities, in the form of large sewage treatment plants, sewage lagoons, or small liquid waste treatment facilities (Appendix G, Table 4). Two of those facilities are located in Illinois and 19 are located in Iowa. There are no waste water treatment facilities in the Study Area in Nebraska.

3.10.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on hazardous materials or waste sites are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would likely have no impacts on hazardous material and waste sites as a result of constructing new track embankment for the Wyanet Connection. A preliminary investigation in 2010 in support of a Tier 1 did not identify any sites of major concern (Iowa DOT, 2010a). In other areas where a minor amount of additional ROW may be needed for upgrades to the rail line, there is a minimal potential for impacts on hazardous material and waste sites. Improvements in Eola Yard could encounter contamination from past spills or leaks of hazardous materials. Specific impacts from this project on hazardous material and waste sites would be determined as the project progresses through its required Tier 2 NEPA documentation. In addition, it is anticipated that the No-Build Alternative would not result in the exposure of hazardous materials from adjacent sites, and would minimally increase the chance of a hazardous material incident during refueling or maintenance operations, or from a spill during operation of the trains.

3.10.4 Impacts of Build Alternative

The impacts on or effects from non-NPL sites, LUST sites, or waste water treatment facilities would pose a lesser risk of contamination than NPL Superfund sites. Table 3.10-1 presents a summary of the number of hazardous material and waste site impacts within the Potential Impact Area.

Table 3.10-1. Hazardous Material and Waste Sites Impacts

State	NPL Superfund	Non-NPL	LUST	Waste Water Treatment
Illinois	0	13	15	0
Iowa	2	12	11	1
Nebraska	1	2	8	0
Total	**3**	**27**	**34**	**1**

As a result of increased train traffic from operations of the Build Alternative, in addition to operations at maintenance and layover facilities, there could be a moderate increase in the chances of a hazardous material incident during refueling, maintenance operations, or from a spill during operation of the trains. As a result, water quality could potentially be affected as railway contaminants or accidental chemical/fuel spills from operations and maintenance activities could reach water resources adjacent to, or downstream of the Potential Impact Area. However, with appropriate permanent best management practices (BMPs) in place, water quality impacts from hazardous materials would be avoided or minimized.

3.10.4.1 NPL Superfund Sites

As a result of acquiring ROW and adding siding and track, the Build Alternative would potentially affect, and/or be affected by the three NPL Superfund hazardous material/waste sites discussed previously: the *Des Moines TCE Site*, the *Railroad Avenue Groundwater Contamination Site*, and the *Omaha Lead Site*. Due to the overall extents of these sites, effects would be unavoidable. Although the Build Alternative is within the contamination areas of these sites, specific impacts cannot be determined in this Tier 1 analysis. There is the potential for exposure to hazardous waste contamination during construction, and the need for mitigation or cleanup procedures could substantially affect project cost. Requirements for safety procedures and protection of human health and the environment would be established to help ensure that there would be no further contamination of adjacent sites and to provide a safe working environment during construction.

3.10.4.2 Non-NPL Sites

The Build Alternative would potentially affect, and/or be affected by 27 non-NPL hazardous material or waste sites as listed in Appendix G, Tables 1, 2, and 3. Of those sites, 13 are in Illinois, 12 are in Iowa, and 2 are in Nebraska. Four of the sites in Illinois are designated as brownfields. Two of the sites in Nebraska, Gould Incorporated and American Smelting and Refining Company (ASARCO) Incorporated, are also included in the description of the Omaha Lead NPL Superfund site.

3.10.4.3 Leaking Underground Storage Tank (LUST) Sites

The Build Alternative would potentially affect, and/or be affected by 34 LUST sites as listed in Appendix G, Table 4. Of those sites, 15 are in Illinois, 11 are in Iowa, and 8 are in Nebraska.

3.10.4.4 Waste Water Treatment Facilities

The Build Alternative would potentially affect, and/or be affected by one waste water treatment facility as listed in Appendix G, Table 5. This site is a small liquid waste treatment facility in Des Moines, in conjunction with the Titan Tire Corporation industrial complex.

3.10.4.5 Solid Waste Disposal

The construction of the Build Alternative has the potential to generate waste material from clearing plant material, excavation of soil and rock, and removal of existing track and railroad ties where replacement is warranted. Other examples of site waste may include construction material packaging, broken equipment/parts, and other excess material. It is anticipated that some of the rock and soil material could be reused for fill material in other construction areas associated with the Project or other nearby construction projects. During typical construction activities, small amounts of soil may be contaminated through on-site motor or hydraulic oil spills. Recyclable construction materials would be taken to recycling facilities that are in compliance with federal, state, and local regulations. Construction debris that cannot be recycled would be disposed of in permitted landfills following proper disposal procedures and in compliance with federal, state, and local regulations. State and local regulations may include prohibitions or limitations on burning of construction debris, and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

Within the limited areas of additional ROW acquisition, there may be instances where demolition of existing structures or buildings would be required. Some of these materials may be recycled. However, some of these buildings or structures may include small amounts of hazardous waste; especially in older industrial areas that are prevalent in the developed portions of the Study Area fronting existing rail lines, and in some cases, testing of hazardous waste may be required. Handling, collection, and disposal of waste materials would be performed according to federal, state, and local regulations, including any waste materials generated by maintenance and layover facilities.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would cause less impacts on or from hazardous material and waste sites than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts on or from hazardous material and waste site areas would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to or from hazardous material and waste site areas within or adjacent to the Potential Impact Area.

3.10.5 Potential Mitigation Measures

As a result of impacts on or from NPL Superfund sites, there is a potential for exposure to hazardous waste contamination during construction, and the need for mitigation or cleanup procedures, depending upon the location of impacts. Requirements for safety procedures and protection of human health and the environment would be established to help ensure that

there would be no further contamination of adjacent sites and to provide a safe working environment during construction.

In areas of additional ROW acquisition or excavation, it is anticipated that there is a potential for exposure of hazardous materials from adjacent sites during construction, however, the level of risk and potential mitigation measures cannot be determined in this Tier 1 analysis. A more detailed investigation of specific site limits, contamination boundaries, and impacts would be performed as part of the Tier 2 NEPA documents. Specific mitigation measures, to the extent required, will be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

All solid waste materials generated during construction of the Project could be recycled or properly disposed of in accordance with the provisions of each state's solid waste management statutes and regulations, and local regulations.

3.11 CULTURAL RESOURCES

The consideration of impacts on cultural resources is subject to several federal laws, regulations and guidelines. Principal among these are NEPA and Section 106 of the National Historic Preservation Act (Section106). Section 106 is implemented through adherence to the regulations 36 CFR Part 800, issued by the Advisory Council on Historic Preservation (ACHP). The FRA, as lead federal agency, is responsible for compliance with both statutes. NEPA and the National Historic Preservation Act (NHPA) encourage federal agencies to coordinate their efforts for compliance with both statutes. Since compliance with neither statute substitutes for the other, FRA is required to gather and prepare information about cultural resources that meets the requirements of both statutes.

3.11.1 Methodology and Regulatory Requirements

Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties (any prehistoric or historic district, site, building, structure, or object listed on or eligible for listing on the National Register of Historic Places [NRHP]). NEPA requires federal agencies to consider the impacts of projects on important cultural and historical resources; a broader range of cultural resources than is considered under the NHPA.

Section 106 compliance for this Tier 1 EIS and future Tier 2 NEPA documents will be consistent with procedures for a phased approach governed by 36 CFR 800.4(b)(2).

Early coordination packages describing the Project and soliciting information were sent to the Illinois, Iowa, and Nebraska State Historic Preservation Offices (SHPOs). The Area of Potential Effect (APE) for the Study was designated as 250 feet on either side of the rail centerline for a total width of 500 feet. FRA sent an email message to the Illinois, Iowa, and Nebraska SHPOs seeking concurrence on the reasonableness of the APE and requesting access to data on historic resources recorded in national and state registers of historic places (see Appendix O). Concurrence with the APE was assumed in accordance with 36 CFR 800.3(c)(4) based on no SHPO responses within 30 days from receipt of the email message. Data on historic properties were gathered from a National Park Service (NPS) database of sites on the NRHP, and from the aforementioned SHPOs' files and databases (GIS and Excel

formats). Sites listed on the NRHP and those confirmed as eligible for listing on the NRHP were identified within the APE.

As the lead federal agency, FRA coordinated with several tribes. These tribes were identified using a compiled list of documented federally recognized tribes with former and current habitation in Illinois, Iowa, and Nebraska along the Corridor. Input from the tribes, including their Tribal Historic Preservation Offices (THPOs), is being used by FRA to identify cultural resource issues of concern to be addressed in this Tier 1 EIS and future Tier 2 NEPA documents.

The objective during the Tier 1 evaluation is to identify the locations of known historic properties and important cultural and historic resources within the APE, and assess the potential for impacts on those properties. Specific effect determinations will not be conducted during Tier 1 analysis. During Tier 2 NEPA evaluations, as more detailed information is available for review of the preferred alternative and specific service alternatives are identified, effect determinations on historic properties for each section of the Project (see Chapter 5 for a discussion of likely individual sections to be addressed in Tier 2) will be proposed to SHPOs and THPOs, as appropriate. If any adverse effects are identified during the Tier 2 NEPA process, they will be addressed through SHPO/THPO consultation and will be in compliance with 36 CFR 800.5 and 800.6.

Procedures to help ensure that the effects and impacts on cultural resources are appropriately considered and coordinated for purposes of Section 106 and NEPA may be addressed under the terms of a Programmatic Agreement (PA) pursuant to 36 CFR Section 800.14. The PA would be developed during the Tier 2 NEPA process, and would guide FRA and the consulting parties[9] in their deliberations on how to take into account the effects of the project for Section 106 purposes, as well as provide coordinative procedures for considering impacts to important cultural and historic resources for purposes of NEPA.

3.11.2 Affected Environment

Railroads served to expedite the development of Illinois, Iowa, and Nebraska by providing efficient and quick transportation pathways. The proposed route includes railroads initially constructed in the 1800s. The rail segment from Davenport to Iowa City is one of the earliest railroad lines constructed in Iowa, and the alignment has changed minimally since its original construction in 1855. This segment also hosted two significant historic events: the Mormon exodus from the State of Illinois, and John Brown's last trip through Iowa prior to the raid at Harpers Ferry, West Virginia. Iowa (Iowa SHPO, 2012). Historic sites, with the exception of archaeological sites whose specific locations are determined to be confidential, within the Study Area are shown in Appendix B, Figures 1 through 162. Appendix H includes a table of all historic sites that are listed on the NRHP or eligible for listing on the NRHP within the APE for the Study. The table data are organized from east to west within the APE by county.

[9] Section 106 consulting parties may include, but are not limited to, the SHPO, THPO, Indian tribes and Native Hawaiian Organizations, local governments, applicants for Federal assistance or approvals (e.g., State DOTs), and others with a demonstrated legal or economic interest or concern with the effects on historic properties.

The APE includes 213 historic resources listed on the NRHP or eligible for listing on the NRHP, including buildings (residential, commercial, and industrial), historic districts, bridges and other structures, and an archaeological site. Several of the properties are related to the operation of the railroad. The density of cultural resource site locations is highest in urban areas.

3.11.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and therefore would not directly impact any historic properties from construction, nor cause indirect impacts from operations of passenger trains (such as ground vibration) along the Study Area. Consequently, no new impacts are projected to occur beyond those that could occur due to other projects. The Chicago to Quad Cities service would contribute to slightly increased noise and ground vibration along this portion of the Chicago to Omaha route. At a Tier 1 analysis, no impacts on significant cultural resource properties were anticipated to occur for the Wyanet Connection and Eola Yard improvements. The Chicago to Quad Cities Expansion Program has the potential to affect historic properties within and between the aforementioned cities, but the impacts would be addressed as part of the Tier 2 NEPA process and Section 106 consultation for that project. Similarly, historic properties impacted during construction of other transportation projects noted in Section 2.2.1 would be addressed as part of Section 106 consultation.

3.11.4 Impacts of Build Alternative

The Potential Impact Area includes 60 historic resources (37 buildings, one structure, three bridges, and 19 historic districts) either listed on the NRHP or eligible for listing on the NRHP, as noted on Table 3.11-1. As the Project proceeds into the Tier 2 NEPA process, avoidance of these properties would be considered. The rail line near Chicago Union Station is located underground beneath the United States Post Office in Cook County, and no expansion of the line is projected to occur in this portion of the Project; consequently, although listed in Table 3.11-1, the post office would not be affected.

Table 3.11-1. Historic Resources within the Potential Impact Area

NRHP Site Number[a]	County and State	Site Name	Site Type
	Cook, IL	Union Station – Chicago	Building
01000868	Cook, IL	United States Post Office – Chicago	Building
	Cook, IL	Water Tower, Well House, and Pump House – (Riverside Landscape Architecture District)	Building
69000055	Cook, IL	Riverside Landscape Architecture District	District
	Cook, IL	Berwyn Suburban Station	Building
	Cook, IL	Stone Avenue Station	Building
06000011	DuPage, IL	Downtown Hinsdale Historic District	District
77001516	DuPage, IL	Naperville Historic District	District
93001238	Kendall, IL	Chicago, Burlington, and Quincy Railroad Depot	Building
85000979	DeKalb, IL	Von KleinSmid Mansion	Building
	LaSalle, IL	Illinois Central Railroad Freight House	Building
	Bureau, IL	Bridge over TR 170B carrying BN RR	Bridge
78003433	Bureau and Henry, IL	Hennepin Canal Historic District	District
07000856	Rock Island, IL	Moline Downtown Commercial Historic District	District
82002596	Rock Island, IL	Rock Island Lines Passenger Station	Building
69000057	Rock Island, IL	Rock Island Arsenal	District
04000175	Rock Island, IL	Lock and Dam No. 15 Historic District	District
	Scott, IA	Littig Brothers/Mengel and Klindt/Eagle Brewery	Building
	Scott, IA	St. Mary's Roman Catholic Church Complex – Rectory	Building
	Scott, IA	St. Mary's Roman Catholic Church Complex – Convent	Building
	Scott, IA	St. Mary's Roman Catholic Church Complex – St. Mary's Church	Building
84001558	Scott, IA	St. Mary's Roman Catholic Church Complex	District
	Scott, IA	House	Building
	Scott, IA	House	Building
	Scott, IA	Davenport Paper Box Company	Building
	Scott, IA	Ewert and Richter Express and Storage Company (West Building)	Building
	Scott, IA	Ewert and Richter Express and Storage Company (East Building)	Building
	Scott, IA	Neu, Vincent J., Auto Dealership	Building
	Scott, IA	Chicago, Rock Island, and Pacific Railroad Elevated Rail Bed	Structure
	Scott, IA	Matthews Building	Building
	Scott, IA	National Biscuit Company	Building
83003656	Scott, IA	Hamburg Historic District	District
03001290	Scott, IA	Crescent Warehouse Historic District	District
84001538	Scott, IA	St. Anthony's Catholic Church Complex	District
	Muscatine, IA	Chicago, Rock Island, & Pacific Railroad – Wilton Depot	Building

NRHP Site Number[a]	County and State	Site Name	Site Type
02001035	Muscatine, IA	West Liberty Commercial District	District
	Johnson, IA	House	Building
	Johnson, IA	House	Building
	Johnson, IA	House	Building
	Johnson, IA	Prizler House	Building
	Johnson, IA	House	Building
	Johnson, IA	Chicago, Rock Island, and Pacific Passenger Station	Building
04001321	Johnson, IA	Melrose Historic District	District
73000732	Johnson, IA	South Summit Street District	District
64500787	Iowa, IA	Amana Colonies	District
76000805	Poweshiek, IA	Chicago, Rock Island and Pacific Railroad-Grinnell Passenger Station	Building
91000384	Poweshiek, IA	Grinnell Historic Commercial District	District
82000410	Jasper, IA	Arthur, Thomas House	Building
	Polk, IA	Grocers Wholesale Company Warehouse	Building
	Polk, IA	Municipal Court and Public Safety Building	Building
03001262	Polk, IA	Linden Heights Historic District	District
88001168	Polk, IA	Civic Center Historic District	District
	Adair, IA	Chicago, Rock Island and Pacific Railroad: Stuart Passenger Station	Building
	Adair, IA	Adair Viaduct	Bridge
	Cass, IA	Chicago, Rock Island, & Pacific Railroad Depot	Building
95000856	Pottawattamie, IA	Chicago, Rock Island & Pacific Railroad Passenger Depot	Building
74001110	Douglas, NE	Burlington Station	Building
96000769	Douglas, NE	Omaha Rail and Commerce Historic District	District
93000558	Douglas, NE	10th Street Viaduct	Bridge
71000484	Douglas, NE	Union Passenger Terminal	Building

Source: National Park Service, not dated, National Register of Historic Places Spatial Database, http://nrhp.focus.nps.gov/natreg/docs/Download.html, Accessed July 6, 2012.
Illinois State Museum. July 2012. Archaeological sites and surveys data for the Chicago to Omaha Corridor. Provided by Nick Klobuchar, Site File Administrator, on July 16, 2012.
Illinois Historic Preservation Agency. September 2012. Architectural properties data for the Chicago to Omaha Corridor. Provided by Trey McGhee, Chief Information Officer, on September 14, 2012.
Iowa Office of the State Archaeologist. July 2012. Archaeological sites and surveys data for the Chicago to Omaha Corridor. Provided by Colleen Eck, Site Records Manager, on July 18, 2012.
Iowa State Historic Preservation Office. Architectural properties data for the Chicago to Omaha Corridor. Provided by Berry Bennett, Iowa Site Inventory Coordinator, on August 3, 2012 (shapefiles) and August 14, 2012 (database information).
Nebraska State Historical Society. July 2012. Archaeological sites and surveys data for the Chicago to Omaha Corridor. Provided by Trisha Nelson, Curator, Archaeology Collections, on July 17, 2012.
Nebraska State Historical Society. August 2012. Architectural properties data for the Chicago to Omaha Corridor. Provided by Patrick Haynes, Historic Resources Survey & Inventory Coordinator, on August 15, 2012.

Note:

[a] *Site number is the NRHP listing number for the resource. Sites eligible for listing are not on the NRHP, and thus have no NRHP listing number.*

Cultural resources within the APE but outside the Potential Impact Area were reviewed for indirect impacts, such as visual intrusion or audible impacts, as a result of construction activities and future operation of the passenger rail system. Depending on the proximity of cultural resources to operating trains, structures may be identified for protection from noise and vibration impacts and incompatible visual intrusions. If the Project would require modification of historic properties, these modifications may be considered potential adverse effects and require further Section 106 consultation. The consultation with SHPOs would be conducted during Tier 2 analyses to determine the preferred method of mitigation.

The replacement of existing rail, ties, and ballast, which is a common practice that is essential to operation and maintenance of any railroad, would not likely represent any adverse effects to historic properties. New stations may be constructed and existing stations may be modified for the Project, but the specific locations and plans for modification would not be known until Tier 2 analyses, and would be reviewed at that time for potential impacts on historic properties.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to historic sites would be less during the initial implementation phase. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.11.5 Potential Mitigation Measures

Potential mitigation could include recordation of site information, improvement of other sites, changes in Project design, or other options. Mitigation measures may be developed in accordance with the terms of a PA between FRA and consulting parties including the ACHP and SHPOs. The timing of the PA would be determined based on input from the consulting parties. The PA would focus on Study commitments, documentation of the qualities that contribute to the historic significance of resources, review procedures, and products to be produced for mitigating adverse effects during the preparation of Tier 2 NEPA documents. The procedures of the PA would specify the sequence and scheduling of decisions to be reached and the manner by which these efforts would be coordinated. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.12 PARKS AND FEDERALLY OR STATE-LISTED NATURAL AREAS

Parks are defined as lands that have been officially designated as such by a federal, state, or local agency. Natural areas are lands designated by Congress or federal or state agencies as wildlife refuges, waterfowl production areas, wildlife management areas, nature preserves, and recreation areas. These designated natural areas can contain rare plants, animals, and other unique natural features, and may also contain habitat for spawning and nursery areas,

nesting and feeding areas, or wintering areas. For purposes of this Tier 1 EIS, state-listed natural areas are defined as public lands managed by Illinois DNR, Iowa DNR, or NGPC. Parks and natural areas may contain recreational resources (such as trails, ball fields, and swimming pools), and recreational resources can also exist independently. For this Tier 1 EIS, federal, state, and local park and recreational resources were identified and assessed for potential impacts. Publicly owned parks, recreation areas, and wildlife or waterfowl refuges that are considered to be significant resources are also addressed in Section 3.13 as Section 4(f) properties.

3.12.1 Methodology and Regulatory Requirements

Potential impacts on parks, recreational resources, and natural areas (as identified in the introduction to this section) would be evaluated in accordance with CEQ guidelines implementing NEPA and FRA's Environmental Procedures.

Data from several sources were used to evaluate potential effects on public parks, recreational resources, and natural areas within the Study Area. Sources included federal, state, and county websites (including GIS data where available), atlases, such as Illinois, Iowa, and Nebraska DeLorme Atlases, aerial photography, and aerial photography mapping programs such as Google Maps. A GIS database of the Study Area was compiled with input from Iowa DNR, Illinois DNR, NGPC, and other state agencies. Data were not digitized for this Tier 1 analysis. For example, GIS shapefiles of trails in Iowa and Nebraska were acquired and used in the analysis, but were not found for Illinois. Consequently, the figures in Appendix B only illustrate Iowa and Nebraska trails.

The name, general location (municipality, county, and state), type, and size of the park, recreational resource, or natural area were identified. Federally and state-listed sites in the Study Area of a sufficient size to be visible were mapped. Local sites were identified and mapped if the boundaries were known.

The analysis for this Tier 1 EIS focused on identifying the number of public parks, recreational resources, and natural areas located within the Study Area and identifying the types of activities with the potential to impact those resources. The activities that would have potential to impact public parks, recreational resources and natural areas include upgrading rail infrastructure and the construction of new passenger stations. Impacts could be through physical modifications of land or effects from increasing noise levels. Specific types and degrees of impacts on individual resources (such as ROW acquisition and impacts on characteristics of a resource) will not be known until further design of rail facilities takes place during Tier 2 analysis, and will be evaluated in Tier 2 NEPA documents. During Tier 2, resource data would be updated in GIS through digitization of field data and publicly available information.

3.12.2 Affected Environment

Public parks, recreational resources, and natural areas within the Study Area are shown in Appendix B, Figures 1 through 162. There are 101 parks (city, county, and state), 65 recreational areas (trails, athletic fields, golf courses, a state recreation area, stadiums, and swimming pools), and 44 natural areas (including wildlife management areas, state natural areas, county forest preserves, woodlands, research areas, and open space). Appendix I

includes a table of all public parks, recreational resources, and natural areas within the Study Area.

3.12.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on parks, recreational resources, and natural areas are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities service would contribute to slightly increased air emissions and noise in parks, recreation areas, and natural areas along this portion of the Corridor. At a Tier 1 analysis, no impacts on parks or recreation areas were anticipated to occur for the Wyanet Connection and Eola Yard improvements, but some prairie areas would likely be disturbed to construct the Wyanet Connection.

3.12.4 Impacts of Build Alternative

The Potential Impact Area includes 44 parks, 24 recreational resources, and 22 natural areas, as listed in Appendix I. In most instances, only a very small portion of the resources are within the Potential Impact Area, which was developed with a sufficient buffer to facilitate design refinement and likely reduction of the area during Tier 2 NEPA analysis. There are three parks (Tiffin City Park in Tiffin, Iowa; Twin Creek Park in Pleasant Hill, Iowa; and Waterworks Park in Des Moines, Iowa) and two natural areas (Zoo Woods Forest Preserve in Riverside, Illinois and Correll Wildlife Area near Adair, Iowa) that are transected by the Build Alternative. There are six locations where there are parks, recreation areas, or natural areas on opposite sides of the Build Alternative:

- Veeck Park and Pierce Park, and Pierce Park and Highland Park in Hinsdale, Illinois
- Heritage Woods Preservation Area and Burlington Park, and Old Plank Park and the Naperville Country Club in Naperville, Illinois
- Steven G Bridge Park and Blackberry Oaks Golf Course in Bristol, Illinois[10]
- Finkbine Golf Course and Finkbine Prairie in Iowa City, Iowa

As the Project proceeds into Tier 2 analysis, avoidance of these properties would be considered. Unavoidable impacts would be further analyzed in the Tier 2 and Section 4(f) NEPA documents. The greatest potential for temporary impacts would be during culvert replacement or bridge work, or during construction of passenger stations or maintenance facilities.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to parks, recreation areas, and natural areas would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of

[10] Steven G. Bridge Park is not currently within the Potential Impact Area, but could be if Blackberry Oaks Golf Course would be avoided.

round-trips increase with subsequent implementation phases, more impacts would occur to parks, recreational areas, and natural areas within or adjacent to the Potential Impact Area. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.12.5 Potential Mitigation Measures

Potential mitigation measures include avoidance or minimization of impacts, replacement of equipment and facilities in another location within existing parkland, purchase of similar properties, planting of woodlands, or development of wetlands in nearby locations, including the use of wetland mitigation banks. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.13 SECTION 4(f) AND 6(f) PROPERTIES

Section 4(f) protected properties are any publicly owned lands of a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance or any land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) within the meaning of Section 4(f) of the USDOT Act (49 USC 303(c)).

Section 6(f) lands are defined as parkland or recreation land that was acquired or developed with funding authorized under Section 6(f) of the Land and Water Conservation Fund Act of 1965 (LWCF). These lands cannot be converted to non-park/recreation use without the approval of the National Park Service. Conversion of these lands is allowed if it is determined that there are no practicable alternatives to the conversion and that there will be provision of replacement property. The replacement property must be of at least equal fair market value and of reasonably equivalent usefulness for recreation purposes as the land proposed to be taken.

3.13.1 Methodology and Regulatory Requirements

FRA cannot approve any program or project that requires the use of Section 4(f) protected properties unless there is no feasible and prudent alternative to the use of such land. In addition, the program or project must include all possible planning to minimize harm to the park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use. One exception to the aforementioned requirement is if FRA determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) would have a *de minimis* impact. A direct use occurs when there is a physical incorporation of land into a transportation facility. A constructive use occurs when a project does “not incorporate land from a section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under section 4(f) are substantially impaired and the resource can no longer perform its designated function (49 USC 303).

Potential impacts on Section 4(f) and 6(f) properties will be evaluated in accordance with CEQ guidelines implementing NEPA, FRA's Environmental Procedures, the requirements set forth in 49 USC 303 for Section 4(f) lands, and 36 CFR 59, Land and Water Conservation Fund Program of Assistance to States.

3.13.2 Affected Environment

Appendix B, Figures 1 through 162 show public parks, recreational resources, and wildlife and waterfowl refuges of national, state, or local significance for the Study Area. The figures also show historic sites of national, state, or local significance that qualify as Section 4(f) protected properties.

Table 1 of Appendix J lists all public parks, public recreational, public natural areas, and historic properties within the Study Area, including a 500-foot buffer (for parks, recreation areas, and natural areas) and a 250-foot buffer on either side of the existing rail centerline for historic sites. Section 4(f) properties were identified in the entire Study Area because the Project needs to be reviewed in Tier 2 for the potential for constructive use to properties beyond the Potential Impact Area. Within the Study Area, there are 101 parks (city, county, and state), 59 public recreational areas (trails, athletic fields, golf courses, a state recreation area, stadiums, and swimming pools), 18 public natural areas (including wildlife management areas, state natural areas, county forest preserves, woodlands, research areas, and open space), and 213 historic properties listed on, are eligible for listing on, the NRHP (including buildings, bridges, other structures, and Historic Districts that would likely qualify as Section 4(f) properties).

3.13.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on Section 4(f) and 6(f) resources are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities service would contribute to slightly increased air emissions and noise in this portion of the Study Area; environmental analysis for this project will evaluate its potential for Section 4(f) impacts. At a Tier 1 analysis, no direct use or constructive use impacts were anticipated to occur for the Wyanet Connection and Eola Yard improvements.

3.13.4 Impacts of Build Alternative

The Potential Impact Area includes 44 public parks, 21 public recreational resources, 8 public refuges, and 60 private and public historic properties, as listed on Table 2 in Appendix J. In most instances, only a very small portion of the resources are within the Potential Impact Area, which was developed with a sufficient buffer to facilitate design refinement and likely reduction of the area during Tier 2 NEPA analysis. In some cases, properties protected by Section 4(f) are transected by the Potential Impact Area (Section 3.13.2).

As the Project proceeds into Tier 2 analysis, avoidance of these properties would be considered. Unavoidable potential impacts would be further analyzed in the Tier 2 NEPA documents. The greatest potential for temporary impacts would be during culvert replacement or bridge work, or during construction of passenger stations or maintenance facilities.

It is not anticipated that these impacts would be substantial and result in a constructive use of these Section 4(f) resources; further evaluation of the potential impacts would be addressed during Tier 2 analysis when more details of the design and operation are known.

An initial review of the National Park Service LWCF database identified three individual parks and five park districts or community park departments within the Potential Impact Area that received LWCF funding (Appendix J, Table 3 includes a list of these properties):

- Cook County Forest Preserve District, Cook County, Illinois
- Community Park, Clarendon Hills, Illinois
- Naperville Park District, Naperville, Illinois
- Tiffin City Park, Tiffin, Iowa
- Altoona Parks Department, Altoona, Iowa
- City of West Des Moines Parks and Recreation, West Des Moines, Iowa
- Walnut Woods State Park, Polk County, Iowa
- City of Omaha Parks and Recreation, Omaha, Nebraska

During Tier 2 analysis, coordination would occur with the administering agencies to determine if lands within the Potential Impact Area were improved with LWCF funding. If any areas are considered to be LWCF lands, potential impacts would be addressed during Tier 2 analysis.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to parks, recreation areas, natural areas, and historic sites would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to parks, recreational areas, natural areas, and historic sites within or adjacent to the Potential Impact Area. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.13.5 Potential Mitigation Measures

Unless exceptions for *de minimis* impact findings are applicable, a feasible and prudent alternative that avoids resources protected under Section 4(f) must be selected. If two or more alternatives affect Section 4(f) lands, the one causing the least relative harm to Section 4(f) properties must be selected, unless the overall environmental impacts of the other alternative are greater.

Where impacts on Section 4(f) properties cannot be avoided, all possible planning must be completed to minimize impacts. Minimization of harm includes both alternative design that lessens the impact on Section 4(f) resources and mitigation measures that compensate for residual impacts. Minimization and mitigation measures should be determined through consultation with the official of the agency owning or administering the resource. Potential

mitigation measures could include replacement of equipment and facilities in another location within existing parkland, purchase of similar properties, planting of woodlands, or development of wetlands in nearby locations.

Section 6(f) lands would be avoided to the extent practicable. For LWCF lands that cannot be avoided, there would be provision of replacement property that is of at least equal fair market value and of reasonably equivalent usefulness for recreation purposes as the land proposed to be taken.

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.14 VISUAL RESOURCES AND AESTHETIC QUALITY

This resource includes both natural and built visual scenic resources along the Study Area and the general aesthetic quality of the visual environment, including the track facility, trains, and stations.

3.14.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to visual resources and aesthetic quality is Environmental Procedures (64 FR 28545).

To determine which visual resources are unique and have potential scenic qualities, a review of each state's scenic byways websites was conducted, and data for public parks, recreation areas, and natural areas (including conservation areas, forest preserves, wildlife refuges, and wildlife management areas) were gathered from the Environmental Systems Research Institute (ESRI), Bing Maps aerial imagery, Iowa DOT natural resources database, Iowa DNR, U.S. Department of the Interior, U.S. Department of Transportation, and the land holdings database of the U.S. Fish and Wildlife Service (USFWS). The ESRI hydrography data, the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD), Iowa DOT rivers databases, and Bing aerial photography were used to compile the list of major rivers with riparian woodlands. In addition, data were obtained for the NPS's historic sites listed in the NRHP, as these sites typically possess aesthetic visual qualities. A compilation of municipal area information, including urban and small town environments and residential neighborhoods, was derived from ESRI data and Bing aerial photography.

3.14.2 Affected Environment

There are two distinct categories of views to be considered in discussing the visual environment: 1) views from the train, which are views of visual/scenic resources; and 2) views of the railroad facilities (siding and track, trains, and stations) from an adjacent vantage point, by people who are sensitive to those views (adjacent residential areas). Public parks, recreational resources, and natural areas within the Study Area are shown in Appendix B, Figures 1 through 162. The figures also readily portray a plan view of rural and urban viewsheds.

3.14.2.1 Views from the Train

The majority of the visual environment through which the route travels is characterized by flat to gently sloping plains of open agricultural cropland, interspersed with areas of gently rolling hills. The remainder of the Study Area travels through the urban built-up environments of the major metropolitan areas of Chicago, the Quad Cities, Iowa City, Des Moines, and Omaha/Council Bluffs; and the built environments of the smaller towns located between those major cities.

Potential visual/scenic resources within or adjacent to the Study Area were divided into six categories: 1) public parks; 2) recreational areas; 3) natural areas (see lists of these three resources in Appendix I); 4) major perennial river corridors with riparian woodlands (see list in Appendix K); 5) historic sites (see list in Appendix H), and 6) city/small town areas. Potential visual/scenic resources within or adjacent to the Study Area include 101 parks, 65 recreation areas, 44 natural areas, 76 major perennial rivers with riparian woodlands, 213 properties listed on or eligible for listing on the NRHP, and 78 built-up environments of the cities (including suburbs) and small towns.

Although the dominant agricultural cropland and pastureland in the Study Area can exhibit visual qualities of their own, the major perennial river corridors contain woodlands and surface water that provide visual contrasts to the vast open areas of the agricultural countryside, and contrasts with the built environments within the cities and towns. The expansive Mississippi and Missouri Rivers would provide unique scenic views as the passenger trains travel on the bridges over these water resources.

Many of the parks, recreation areas, and natural areas also contain wooded areas, manicured open fields, and/or water bodies, which can provide visual interest. In addition, historic buildings and structures scattered within the cities and towns, possess unique architectural elements that can provide scenic qualities for on-looking passengers. In some instances, the remainder of the buildings in the urban areas and small towns can possess aesthetic qualities and provide views of urban and small town character, if they are well-maintained and in harmony with the context of the surrounding environment.

A unique scenic resource in the Study Area is at the west edge of Iowa where the Loess Hills landform provides a visual environment of peaked hills, steep side slopes, narrow ridge crests, and sometimes vertical bluffs of exposed tan-colored silt, contrasting with the relatively flat surrounding landscape.

3.14.2.2 Views of the Railroad Facilities

Individuals concentrated in the adjacent residential areas of municipalities (cities, suburbs, and towns) who would have the potential for undesirable views of the railroad facilities are considered to be sensitive visual receptors. There are 79 municipal areas along the rail line that contain potential sensitive visual receptors.

Existing views of the railroad siding and track are uniform and similar throughout the Study Area. Although the siding and track are low-profile visual elements in the landscape, the current trains are vertical elements that are periodically seen by sensitive viewers. Currently, views of passenger and freight trains occur frequently in the Chicago to Wyanet, Illinois portion of the Study Area. The residential areas within the cities and towns along the Study Area from Wyanet to Council Bluffs, Iowa, currently experience periodic views of only

freight trains. Existing train stations and depots are also visible to residents in adjacent neighborhoods. However, the architecture of the depot buildings is typically considered aesthetically pleasing and some are listed in the NRHP.

3.14.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on visual/scenic resources and sensitive visual receptors are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would result in potential minor impacts or alterations on visual/scenic resources as a result of constructing new track embankment for the Wyanet Connection as it traverses part of the riparain woodland of a major perennial waterway (Pond Creek). The Eola Yard improvements would be in a railroad yard, and negligibly changed views from a train or of the railroad facitilities. In addition, potential culvert replacements/extensions and minor bridge replacements/additions at other major perennial rivers along the Study Area could result in minor alterations of those visual/scenic resources. It is anticipated that there would be minimal or no direct impacts on other visual/scenic resources because of little or no additional ROW acquisition in the remainder of the Study Area. Specific impact areas will be identified during the Chicago to Quad Cities Tier 2 NEPA analysis as more specific project limits are identified.

3.14.3.1 Views from the Train

Views of the visual/scenic resources from the passenger trains, may vary in duration depending on train speed, the distance of the resource from the Corridor, and the presence or absence of vegetatation or structures that could act as visual barriers prior to arrival near the visual/scenic resource.

Culvert replacements or extensions, and bridge replacements or additions, at the major perennial river crossings would necessitate removal of some of the riparian woodland, which is an aesthetic feature of those resources. However, the removal of vegetation may be beneficial by opening up the views to the remaining or distant portions of the visual/scenic resource. To improve site distance at crossings for vehicle and train traffic, tree and brush clearing could occur, which could open up views to other visual/scenic resources that may be in the vicinity of those areas.

3.14.3.2 Views of the Railroad Facilities

With the additional passenger trains, running two round-trips per day at 79 mph from Chicago to the Quad Cities, there would be a minimial increase in the frequency of views of the trains, from sensitive visual receptors in the vicinity. Consequently, the effects of the Chicago to Quad Cities Expansion Program on the receptors would be minimal, since residents in those areas are already accustomed to views of the trains.

3.14.4 Impacts of Build Alternative

The construction activities of the Build Alternative; including tree and brush clearing, placement of fill material for additional track and siding, stream relocations, culvert replacement or extensions, bridge replacement or additions, and new or expanded station areas; could have the potential to impact visual/scenic resources and affect sensitive visual receptors present in the Study Area.

3.14.4.1 Views from the Train

As indicated in Section 3.12, the Build Alternative would result in direct impacts on 44 public parks, 24 recreational areas, 22 natural areas, and 78 city and small town environments. In addition, all 76 of the major perennial rivers and/or their riparian areas would either be crossed or potentially impacted by longitudinal encroachments on the riparian area, thereby resulting in minimal linear alterations of these resources. Siding and track additions, culvert replacements or extensions, and bridge replacements or additions, would necessitate removal of some of the wooded areas, considered to be aesthetic features. However, the removal of vegetation may be beneficial by opening up the views to the remaining or distant portions of the visual/scenic resource, as well as the water surface in relation to the major rivers. Only small portions of these visual/scenic resources would be within the Potential Impact Area because additional ROW would be abutting the existing ROW rather than being on new alignment. As a result, alteration of these resources and effects on the views of those resources would most likely be minimal. In addition, the expansive Mississippi and Missouri Rivers would provide unique scenic views as the passenger trains travel on the bridges over these water resources.

The Build Alternative would have linear impacts on the Loess Hills landform area as a result of adding track and siding through this unique visual resource in the northeast portion of Council Bluffs, Iowa. The linear impacts would be minimal and the existing views of the Loess Hills would remain open for the passengers of the trains. An additional area of impact in the Loess Hills would result from a potential new station location just southeast of the intersection of I-80 and Highway 6, in the northeast corner of Council Bluffs (Appendix B, Figures 156 and 157). This area is characterized by rolling hills of open grassland. A new station facility in this area would result in impacts to the scenic resource by removing the natural landform on this property, and replacing it with a building and parking facilities.

The Build Alternative has the potential to affect 60 properties (buildings, structures, bridges, or historic districts) within the Potential Impact Area (Table 3.11-1). However, measures to avoid or minimize impacts to those historic resources would be analyzed in the Tier 2 NEPA documents. In addition, impacts to the urban character and small town character of the built-up environments would be minimal, as there would be very little, if any, additional ROW required in these areas.

Although the Build Alternative would result in impacts on several visual/scenic resources, those impacts would be minimal and would be offset by the beneficial impacts on the passengers of the trains by providing visual access to those resources throughout the Study Area. To improve site distance at some crossings for vehicle and train traffic, tree and brush clearing may be required. However, this could also open up views to other visual/scenic resources that may be in the vicinity of those areas.

Views of the visual/scenic resources from the passenger trains may vary in duration depending on train speed, the distance of the resource from the Corridor, and the presence or absence of vegetatation or structures that could act as visual barriers prior to arrival at the vicinity of the visual/scenic resource.

3.14.4.2 Views of the Railroad Facilities

The Project improvements for the Build Alternative would be visually similar to the existing railroad facilities. The views of the additional siding and track, from the residential neighborhoods of the cities and small towns in the Study Area, would be similar to the existing views to which the adjacent residents are already accustomed. Although they are currently accustomed to seeing passenger trains and freight trains between Chicago and Wyanet, and only freight trains between Wyanet and Omaha, the proposed alternative would add seven more passenger trains per day at speeds up to 110 mph between Chicago and Omaha. The passenger trains would be shorter and faster than the freight trains, resulting in views of the trains that would be of shorter duration than those of the freight trains.

Although the visual/scenic resources provide views for passengers on the trains, in some cases, the visibility of the railroad facilities from those resources could be considered an incompatible visual intrusion, depending upon the sensitivity of the resource. As indicated in Section 3.13, all of the 44 public parks, 21 of the public recreation areas, 8 of the public natural areas, and all 60 of the historic properties are considered Section 4(f) resources, and as such, views of the railroad facilities from these resources would be a consideration in the impacts evaluation on those resources. It is not anticipated that visual impacts would adversely affect any of those resources because the views of railroad facilities are not new, and because of the visual/scenic resources' proximity to the railroad. Visual considerations and impact avoidance or minimization in regard to Section 4(f) resources would be analyzed further in the Tier 2 NEPA documents.

The Build Alternative follows existing railroad alignments and would travel by residential areas containing sensitive visual receptors who are currently accustomed to seeing trains. One exception would be in the east side of Des Moines, where the Des Moines Design Option 3 alignment would pass through a residential neighborhood along the abandoned Wabash rail corridor parallel to the Southeast Connector (Appendix B, Figures 114 and 115). This neighborhood is currently not exposed to views of railroad facilities, and Design Option 3 would bisect the neighborhood, resulting in a negative visual impact on these sensitive visual receptors.

One station area in Grinnell, Iowa and a potential station area in Omaha may be located adjacent to, or in the vicinity of residential areas. Those sensitive visual receptors would be subject to views of the stations. Although there may be a change in the exisiting environment, new development or expansion of the facilities could incorporate appropriate aesthetic design elements and landscaping to complement or enhance the visual quality of the existing surroundings.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer visual impacts than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to visual resources and sensitive visual receptors would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent

implementation phases, more impacts would occur to visual resources and sensitive visual receptors within or adjacent to the Potential Impact Area.

A more detailed analysis of visual/scenic resources, sensitive visual receptors, the potential degree of change or alteration to existing resources and views, and considerations for aesthetic quality in station design, will be addressed in the Tier 2 NEPA documents.

3.14.5 Potential Mitigation Measures

Through the public involvement process, residents' concerns about the potential views of the railroad facilities would be determined. Mitigation and impact minimization efforts would be addressed in more detail in the Tier 2 NEPA documents and could include consideration of potential measures such as appropriate re-vegetation of disturbed areas of the scenic resources and visual screening of railroad facilities from adjacent residential areas.

A general strategy to minimize and mitigate for visual impacts of potential new station facilities or expansion of existing facilities could include consideration of appropriate design of aesthetic features and landscaping that would complement and blend with the context of the surrounding visual environment.

As discussed in Section 3.19, if land disturbance within the Loess Hills area is unavoidable, coordination should take place with Iowa DNR regarding mitigative buffer zones adjacent to areas of native vegetation and re-establishing native vegetation on disturbed areas. Mitigation measures could also include shaping areas to blend into the natural character of the surrounding hills.

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.15 WATERWAYS AND WATER BODIES

Waterway and water body resources include perennial and intermittent streams, and lakes and ponds as designated on USGS maps and USFWS National Wetlands Inventory (NWI) maps.

3.15.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to these water resources includes Section 404 of the Clean Water Act of 1972 (as amended) and the Rivers and Harbors Act of 1899 (33 USC 401 et. seq., as amended and supplemented; 23 CFR 650, subparts D and H, 33 CFR 114-115).

The ESRI hydrography data and the NPS Nationwide Rivers Inventory (NRI) were used to compile GIS data for locations of waterways, in the form of rivers and perennial and intermittent streams. Waterway information was supplemented by stream data from the USGS NHD, the Illinois Natural Resources Geospatial Data Clearinghouse, and Iowa DOT databases. Additional data included the USFWS NWI maps for designations of deep water lakes (lacustrine) and open water ponds (palustrine unconsolidated bottom). In addition, the Iowa Department of Natural Resources' (Iowa DNR, 2009a and 2009b) website was reviewed to obtain input regarding special designations of Meandered Sovereign Waters, a designation unique to Iowa.

In conjunction with the Tier 2 NEPA documents, a more detailed impact analysis of waterways and water bodies would be conducted, including field surveys, at which time there is the potential for additional waterways and water bodies to be found. Smaller streams with an Ordinary High Water Mark (OHWM) and connections to jurisdictional streams that were not included in the mapping databases may be found. Coordination would take place with the USACE to determine which water resources are jurisdictional or non-jurisdictional for Section 404 permitting purposes and mitigation requirements, in addition to coordination with state resource agencies.

For permitting purposes, the project lies within three USACE regulatory districts: the Chicago District for eastern Illinois, the Rock Island District for central and western Illinois and most of Iowa, and the Omaha District for Nebraska which includes Nebraska and a small portion of Iowa west of the federal levee system in Council Bluffs, Iowa. Illinois provides a joint permit application form which is submitted to the Illinois DNR, Illinois EPA, and USACE for a floodplain permit, Section 404 permit, Section 401 Water Quality Certification, and public waters permits. Iowa provides a joint permit application form which is distributed to Iowa DNR and USACE to obtain a Section 404 permit, Section 401 Water Quality Certification, a floodplain construction permit, and a Sovereign Lands/Waters construction permit. The NDEQ regulates stream impacts under its Section 401 Water Quality Certification authority, in conjunction with the USACE's Section 404 permit. The U.S. Coast Guard's Section 9 bridge permit would be required for any new bridge structures over rivers that are considered navigable by the Coast Guard, as well as a Section 10 permit from the USACE.

Jurisdictional water resources are considered Waters of the U.S., and as such, the discharge of fill material below the OHWM of jurisdictional waters is regulated by the USACE and would require a Section 404 Permit in the design stage, in addition to mitigation.

3.15.2 Affected Environment

When railroad lines were first built in the Midwest, they were located along the valleys of rivers and creeks, wherever possible, to take advantage of the level and nearly level terrain, thereby minimizing cut and fill construction operations. Consequently, the Study Area runs parallel to and perpendicular to waterways throughout the Study Area. The waterways and water bodies near or within the Study Area are shown in Appendix B, Figures 1 through 162.

The 76 major named perennial streams in the Study Area are listed in Appendix K, Table 1 by state and county. The Chicago Sanitary and Ship Canal, the Des Plaines River, the Mississippi River, and the Missouri River are important waterways in the Study Area that are used for commercial navigation. These rivers would be crossed on existing bridges, with the exception of the Chicago Sanitary and Ship Canal which runs parallel to the route in the downtown Chicago area. There are also smaller perennial streams and intermittent streams throughout the Study Area. Some segments of a particular stream run perpendicular, parallel, or skewed to the Study Area, or lie within it in more than one location.

Special designations by the NPS have also been given to a few of the waterways near the Study Area. The NPS has compiled the NRI, which is a listing of free-flowing river segments "…that are believed to possess one or more 'outstandingly remarkable' natural or cultural values judged to be of more than local or regional significance" (NPS, 2011). Although there

are no segments of NRI-listed streams directly within the Study Area, four streams are crossed that have NRI segments in relative proximity to the Study Area: the Fox River (2 miles), Big Indian Creek (0.75 mile), and Big Bureau Creek (1.5 miles), all of which are in Illinois; and the Cedar River (1 mile) in Iowa.

The Iowa DNR designates the Cedar River, Iowa River, Des Moines River, and Raccoon River as Meandered Sovereign Rivers which require special permitting, if impacted. Although Iowa DNR also designates some stream segments as Protected Water Areas (Scenic Rivers), none are within the Study Area.

There are 20 water bodies designated as deep water lakes (lacustrine) on the NWI maps, and 197 open water ponds (palustrine unconsolidated bottom) scattered along the Study Area (Appendix B, Figures 1 through 162). Most of the lakes are the result of previous surface mining excavations, while a few were formed by damming streams. Although Iowa DNR has also designated certain lakes as sovereign, none are located in the Study Area.

3.15.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and no project related impacts on waterways and water bodies are anticipated beyond those that could occur due to other projects. As part of the Chicago to Quad Cities Expansion Program, minimal disturbance would occur outside existing ROW, except for a BNSF and IAIS connection near Wyanet, Illinois. There would be direct impacts to a perennial stream (Pond Creek) as a result of constructing new track embankment for the Wyanet Connection and relocation of a linear water of the U.S. for the Eola Yard improvements. In addition, minor impacts on waterways and water bodies from potential culvert replacements/extensions and bridge replacements/additions in other areas of the project may also occur. Specific quantitative impacts from this project on waterways and water bodies would be determined as the project progresses through its required Tier 2 NEPA documentation. There is also the potential for temporary construction impacts from possible culvert or bridge replacements along the remainder of the rail route, as a part of ongoing maintenance.

3.15.4 Impacts of Build Alternative

Impacts from the Build Alternative on waterways are unavoidable since some stretches of the existing railroad were originally built along waterways and floodplains.

As shown in Table 3.15-1, construction of the Build Alternative would directly impact approximately 323 waterway segments, totaling approximately 104,150 linear feet. These waterway segments would be impacted by construction activities including placement of fill material for additional track and siding, culvert replacement or extensions, and bridge replacement or additions. In some areas, these impacts would include relocation of parallel stream segments that would be impacted by new track embankments. Although the Build Alternative would cross all four of Iowa's Meandered Sovereign Rivers, none of the NRI stream segments would be directly impacted. The rail line would cross the Mississippi River on an existing bridge and may cross the Missouri River on an existing bridge or one or two new bridges in order to support additional passenger train service for the Build Alternative. The Build Alternative would also impact portions of seven lakes, totaling approximately 32 acres, and 44 ponds, totaling approximately 33 acres.

Although construction impacts on waterways and water bodies would occur as a result of soil erosion and potential construction pollutant loading of stormwater runoff, they would be temporary and would cease after construction is completed.

Table 3.15-1. Impacts on Waterways and Water Bodies

State	Perennial Streams	Intermittent Streams	Lakes	Ponds
Illinois				
No.	41	54	4	11
L.F. / Ac.	16,880 L.F.	17,360 L.F.	5 Ac.	4 Ac.
Iowa				
No.	65	162	3	28
L.F. / Ac.	15,360 L.F.	54,235 L.F.	27 Ac.	27 Ac.
Nebraska				
No.	1	0	0	5
L.F. / Ac.	315 L.F.	0 L.F.	0 Ac.	2 Ac.
Total				
No.	**107**	**216**	**7**	**44**
L.F. / Ac.	**32,555 L.F.**	**71,595 L.F.**	**32 Ac.**	**33 Ac.**

Notes:

No. = Number; L.F. = Linear Feet; Ac. = Acres

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer impacts on waterways and water bodies than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to waterways and water bodies would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to waterways and water bodies within or adjacent to the Potential Impact Area.

3.15.5 Potential Mitigation Measures

In conjunction with the Tier 2 NEPA documents, the waterways would be reviewed to determine where it is possible and practical to avoid or minimize impacts.

Mitigation options available for unavoidable impacts on jurisdictional waterways and water bodies would be discussed in more detail during the Tier 2 NEPA documents. Mitigation measures could include mitigation banking, in-lieu fees, and on-site or off-site permittee-responsible mitigation. During the design process, coordination would take place with the USACE and appropriate state resource agencies to develop mitigation strategies. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.16 WETLANDS

The regulatory definition of wetlands, as adopted by the U.S. Environmental Protection Agency (USEPA, May 11, 2012) and USACE to administer the USACE's Section 404 permit program is "[Wetlands are] those 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." Wetlands generally include swamps, bogs, and similar areas (USEPA, 40 CFR 239.2 and CE, 33 CFR 328.3). For this analysis, this resource includes vegetated wetland areas as designated on the USFWS NWI maps.

3.16.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to wetlands includes Section 404 of the Clean Water Act of 1972 (as amended), Executive Order 11990, Protection of Wetlands (USDOT Order 5660.14; 23 CFR 777), and the Interagency Wetland Policy Act of 1989 (20 ILCS/830/1-2, et seq.) and administrative rules promulgated there under (17 Ill. Adm. Code Part 1090).

In conjunction with the Tier 2 NEPA documents, a more detailed impact analysis of wetlands would be conducted, including field surveys, to determine which areas meet the USEPA and USACE regulatory criteria and definition of a wetland, and to determine the type and boundaries of those wetland areas. There is also the potential for additional wetlands to be found in the course of those surveys. Coordination would take place with the USACE to determine which wetland areas are jurisdictional or non-jurisdictional for Section 404 permitting purposes and mitigation requirements, in addition to coordination with state resource agencies.

For permitting purposes, the project lies within three USACE regulatory districts as discussed in Section 3.15.5. Illinois provides a joint permit application form, which is submitted to the Illinois DNR, Illinois EPA, and USACE for floodplain and public waters permits. Iowa provides a joint permit application form. The NDEQ regulates stream impacts under its Section 401 Water Quality Certification authority, in conjunction with the USACE's Section 404 permit. The U.S. Coast Guard's Section 9 bridge permit would be required for any new bridge structures over rivers that are considered navigable by the Coast Guard, as well as a Section 10 permit from the USACE.

The USFWS NWI database was used to compile GIS data for locations of vegetated wetland areas within the Study Area.

3.16.2 Affected Environment

Appendix B, Figures 1 through 162, show the NWI wetlands near or within the Study Area. The NWI maps are based on a classification system known as the Cowardin System, which classifies the types of ecosystems related to water resources (Cowardin, 1979). Typical vegetated wetlands in the Midwest include, but are not limited to, emergent (herbaceous), scrub-shrub, and forested wetlands.

Areas that are mapped as vegetated wetlands on the NWI maps have the potential of being regulated as special aquatic sites by the USACE. The regulatory definition of wetlands emphasizes that wetlands must possess three essential characteristics before a positive

determination of a wetland can be made: hydric soils,[11] a prevalence of hydrophytic vegetation,[12] and a persistent wetland hydrology.

The vegetated wetland systems present within the Study Area include Palustrine Aquatic Bed (PAB), Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), and Palustrine Forested (PFO). Although there are several wetland areas scattered throughout the Study Area, most of the larger concentrations of wetlands occur in the floodplains of, and adjacent to, the following perennial streams:

- Little Rock Creek (Appendix B, Figure 19)
- Somonauk Creek (Appendix B, Figure 20)
- Big Bureau Creek (Appendix B, Figure 37)
- Green River (Appendix B, Figures 50 through 52)
- Rock River (Appendix B, Figure 53)
- Mississippi River (Appendix B, Figures 55 through 57)
- Cedar River (Appendix B, Figures 66 and 67)
- Wapsipinicon Creek (Appendix B, Figure 69)
- Iowa River (Appendix B, Figure 75)
- Clear Creek (Appendix B, Figures 76 through 80)
- Big Bear Creek (Appendix B, Figures 85 through 88)
- Little Bear Creek (Appendix B, Figures 91 and 92)
- South Skunk River (Appendix B, Figures 105 through 108)
- Fourmile Creek (Appendix B, Figures 113 and 114)
- Raccoon River (Appendix B, Figures 116 through 122)
- Turkey Creek (Appendix B, Figures 136 through 140)
- East Nishnabotna River (Appendix B, Figure 142)
- West Nishnabotna River (Appendix B, Figures 148 and 149)
- Missouri River (Appendix B, Figures 160 through 162)

3.16.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and project related impacts to wetlands would not occur beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would contribute to minimal impacts on a wetland area as a result of constructing the Eola Yard improvements. In addition, other minor wetland impacts would occur as a result of potential culvert replacements/extensions and bridge replacements/additions at other wetland areas in the Corridor. Specific quantitative impacts on wetlands from this project would be determined as the project progresses through its required Tier 2 NEPA documentation. There is also the potential for temporary construction impacts from possible culvert or bridge replacements along the remainder of the rail route, as a part of ongoing maintenance.

[11] Hydric soils are soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (NRCS, August 10, 2012).

[12] Hydrophytic vegetation is "plant-life that thrives in wet conditions" (Illinois DNR, 2012).

3.16.4 Impacts of Build Alternative

Impacts from the Build Alternative on wetlands that are located adjacent to existing ROW are unavoidable since some stretches of the existing railroad were originally built along several waterways and floodplains where wetlands occur.

As shown in Table 3.16-1, construction of the Build Alternative would directly impact approximately 372 wetlands, totaling approximately 238 acres, the majority of which would occur in Iowa. These wetlands would be impacted by construction activities including placement of fill material for additional track and siding, culvert replacement or extensions, and bridge replacement or additions.

Although construction impacts on wetlands may occur, as a result of soil disturbance and potential construction pollutant loading of stormwater runoff, they would be temporary and would cease after construction is completed.

Table 3.16-1. Impacts on Wetlands (by type)

State	Palustrine				Total
	Aquatic Bed (PAB)	Emergent (PEM)	Scrub-Shrub (PSS)	Forested (PFO)	
Illinois					
No.	2	38	5	29	**74**
Ac.	1	16	1	13	**31**
Iowa					
No.	0	128	27	126	**281**
Ac.	0	56	31	106	**193**
Nebraska					
No.	0	11	3	3	**17**
Ac.	0	12	1	1	**14**
Total					
No.	**2**	**177**	**35**	**158**	**372**
Ac.	**1**	**84**	**33**	**120**	**238**

Notes:
No. = Number; Ac. = Acres

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer wetland area impacts than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to wetland areas would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to wetland areas within or adjacent to the Potential Impact Area.

3.16.5 Potential Mitigation Measures

In conjunction with the Tier 2 NEPA documents, wetlands would be reviewed to determine where it is possible and practical to avoid or minimize impacts.

Mitigation options available for unavoidable impacts to jurisdictional wetlands would be discussed in more detail during the Tier 2 NEPA documents and could include mitigation banking, in-lieu fees, and on-site or off-site permittee-responsible mitigation. During the design process, coordination would take place with the USACE and appropriate resource agencies to develop appropriate mitigation strategies. Specific mitigation measures, to the extent required, will be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.17 WATER QUALITY

Water quality refers to the potential effects of sediment erosion and chemical pollution on surface water resources (streams, lakes, ponds, wetlands) and on groundwater in relation to karst areas.

3.17.1 Methodology and Regulatory Requirements

The federal Water Pollution Control Act, Section 303(d), requires that each state identify those waters that are not meeting the state's water quality standards. Other regulations pertaining to water quality includes Sections 401 and 402 of the Clean Water Act of 1972 (as amended) and EO 12088, Federal Compliance with Pollution Control Standards (43 FR 47707). The list of surface waters provided in Section 3.16.2 was reviewed.

To determine potential karst regions in the Study Area, information was obtained from Internet data and mapping by the Illinois State Geological Survey (ISGS), Illinois Department of Natural Resources (Illinois DNR), Iowa DNR, Nebraska DNR, and Nebraska Emergency Management Agency (NEMA). The most recent 303(d) lists of impaired waters were gathered from the websites of Illinois EPA, Iowa DNR, and NDEQ. Well locations were compiled from the Illinois Natural Resources Geospatial Data Clearinghouse website, the Iowa DOT database, and the Nebraska DNR website. Data for waste water treatment facilities in all three states were compiled from USEPA's Facility Registry System and were supplemented with Iowa DOT data, and aerial photography.

3.17.2 Affected Environment

As discussed in Sections 3.15.2 and 3.16.2, the Study Area contains perennial and intermittent waterways, wetlands, and other surface water resources, all of which can be affected by runoff of pollutants from the project. Appendix B, Figures 1 through 162, show the water resources near or within the Study Area.

As discussed in Section 3.15.1, there are no NRI stream segments located within the Study Area, however, there are four streams crossed by the Study Area that have NRI segments in proximity to, and downstream of, Study Area. They are: the Fox River (2 miles; Appendix B, Figure 13), Big Indian Creek (0.75 mile; Appendix B, Figure 25), Big Bureau Creek (1.5 miles; Appendix B, Figure 37), all of which are in Illinois; and the Cedar River in Iowa (1 mile; Appendix B, Figures 66 and 67).

The Study Area also includes four rivers in Iowa (Cedar River, Iowa River, Des Moines River, and Raccoon River) which Iowa DNR designates as Meandered Sovereign Rivers, which require special permitting, if impacted.

The federal Water Pollution Control Act, Section 303(d), requires that each state identify those waters which have uses that are impaired by pollutants and, as a result, are not meeting the state's water quality standards. This list of water quality limited (impaired) surface waters is referred to as the 303(d) List. There are 28 streams (Appendix L, Table 1) included on the 303(d) list (USEPA, March 6, 2012), but no other water bodies within the Study Area.

In addition to runoff of pollutants potentially affecting surface water resources, groundwater also can be affected by runoff as surface flow can be quickly lost through caves, sinkholes, and open fractures where there is minimal, if any, soil cover to act as a filter. Bedrock near the ground surface, composed of easily dissolved limestone and dolomite, is referred to as karst terrain and is characterized by fractures, caves, sinkholes, springs, and losing streams.[13] Groundwater in karst areas is highly susceptible to contamination from any pollutants that could travel with stormwater surface flow and into karst features.

According to mapping available through the Illinois DNR, ISGS, and NEMA websites, the Study Area does not pass through any major karst areas in Illinois or Nebraska. Although Iowa DNR mapping shows that the Study Area is not within major karst areas, it is on the southern edge of a potential karst region in the eastern portion of the state (Iowa DNR, 2012). A small portion of the potential karst areas are mapped in the Study Area in the northeast corner of Muscatine County and along the south side of the Muscatine/Cedar County line.

There is also a potential for water wells to be located adjacent to the existing railroad ROW. The locations of wells have not been determined for this Tier 1 analysis but would be investigated in the Tier 2 NEPA studies.

The Study Area contains 21 municipal or industrial waste water treatment facilities, in the form of large sewage treatment plants, sewage lagoons, or small liquid waste treatment facilities. These facilities are discussed as part of Section 3.10.

3.17.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and permanent project related impacts on water quality would not occur beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would result in potential temporary impacts on water quality as a result of constructing new track embankment for the Wyanet Connection and implementing the Eola Yard improvements, and potential culvert or bridge replacements in other areas of the Project where water resources would be impacted. Specific impacts from this project on water quality would be determined as the Project progresses through its required Tier 2 NEPA documentation. There is also the potential for temporary construction impacts from future culvert or bridge replacements along the remainder of the rail route as a part of ongoing maintenance.

[13] A losing stream is a stream where flow is reduced as it moves downstream because it infiltrates into the ground, recharging groundwater.

The current rail routes between Chicago and Omaha would continue to be used, resulting in continued potential minor impacts on water quality. Erosion and sedimentation from railroad grades to adjacent water resources, and potential pollutant runoff and spills from operation and maintenance activities could potentially reach adjacent water resources.

3.17.4 Impacts of Build Alternative

The Build Alternative would cross 24 of the 28 streams on the 303(d) List of Impaired Waters (water quality limited waters) within the Study Area. The remaining four streams would not be crossed or otherwise encroached upon, but are close enough to the Study Area to have the potential of receiving runoff from the Study Area.

The Build Alternative would also potentially affect the water quality of several other water resources described in Sections 3.15 and 3.16 as a result of soil erosion from stormwater runoff, fill material placed in water resources, and construction of bridges and culverts or culvert extensions. The avoidance or minimization of sediment pollution would be accomplished in appropriate areas by the use of BMPs as discussed below for potential mitigation measures.

Construction activities of the Build Alternative have the potential to temporarily affect water quality as a result of soil erosion and potential construction pollutant loading of stormwater runoff. BMPs would be used during construction to control water pollution through the use of temporary measures as discussed below for potential mitigation measures.

The potential for the Build Alternative to adversely affect groundwater is minimal, since there are no major karst areas within the Potential Impact Area. The Build Alternative is located at the southern edge of a “potential” karst area, which would be investigated further in the Tier 2 NEPA documents, in coordination with Iowa DNR. BMPs would be used to divert any stormwater or pollution runoff from entering karst features, if present in the Study Area.

The Project has the potential to affect groundwater in areas with groundwater wells. Although the exact locations of groundwater wells have not been determined as part of the Tier 1 analysis, wells would be investigated in the Tier 2 NEPA documents, and/or during preliminary design, when more specific locations and impacts can be determined.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speed of passenger trains would result in fewer water quality impacts than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts to water quality would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to water quality within or adjacent to the Potential Impact Area.

3.17.5 Potential Mitigation Measures

The potential of the proposed project to adversely affect water quality during construction activities could be mitigated by the development and implementation of Stormwater Pollution Prevention Plans (SWPPPs) and the use of temporary and permanent BMPs. The avoidance or minimization of sediment pollution could be accomplished by the use of BMPs, such as rock berms/ditch checks, drainage basins (detention/retention), vegetated swales, seeding and mulching. At new stations, retention/detention basins, if appropriate, may be incorporated on-site to avoid or minimize water quality impacts by reducing stormwater runoff from the site.

BMPs could be used during construction to control water pollution through the use of temporary measures, such as berms, slope drains, sediment basins, straw bales, silt fences, seeding and mulching. In addition, disturbance to stream banks and riparian zones could be minimized and limited to only that which is necessary to construct the Project.

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known. The Tier 2 NEPA documents would further address mitigation measures and control of pollutants and sediments in regard to the National Pollutant Discharge Elimination System (NPDES) permitting, SWPPPs, and BMPs. In addition, each state's required Section 401 Water Quality Certifications would be addressed.

The Tier 2 NEPA documents would also address the need for mitigation of impacts on mapped or unmapped water wells, including proper abandonment of the wells (such as plugging and sealing) to prevent groundwater pollution from construction and from future operations and maintenance. Specific mitigation measures would be implemented prior to construction.

3.18 FLOODPLAINS

This resource includes areas of 100-year floodplain (areas with a one percent annual chance of flooding) as defined by the Federal Emergency Management Agency (FEMA) in accordance with 44 CFR 59.1.

3.18.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to floodplains is Executive Order 11988, Floodplain Management (as amended), which affords avoidance and minimization considerations to floodplains. As stated in this policy, federal agencies are required "… to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative". In addition, the State Emergency Management Agencies (SEMAs) have floodplain management programs.

Digital 100-year floodplain data (Zone A and Zone AE), based on FEMA's Flood Insurance Rate Maps (FIRMs) of Special Flood Hazard Areas (SFHAs), were compiled from the FEMA website. SFHAs (or 100-year floodplains) are the areas subject to flooding by the one percent annual chance flood. SFHA Zone A is designated as having no base flood elevations determined, whereas in SFHA Zone AE, base flood elevations have been determined. Where floodplain data for some counties were not available in digital format,

the FIRMs were used to digitize the 100-year floodplain within the Study Area. However, there are some streams in three counties in Iowa, for which FEMA floodplain mapping was not available in the Study Area, including Mud Creek in the southeast corner of Cedar County, Little Bear Creek and Big Bear Creek throughout Poweshiek County, and Turkey Creek in the northwest corner of Adair County.

Executive Order 11988, Floodplain Management (as amended), requires federal agencies to avoid adverse impacts on floodplains, to the extent possible, and to avoid situations that would support floodplain development if a practicable alternative exists. Potential avoidance and minimization of impacts on 100-year floodplains would be further evaluated in the Tier 2 NEPA documents. Coordination with the SEMAs, which have Floodplain Management Programs, the DNRs of each state, and local floodplain administrators would be initiated for any proposed encroachments in a 100-year floodplain area, and to discuss floodplain development permitting and potential mitigation measures.

3.18.2 Affected Environment

Most of the major perennial waterways within the Study Area have 100-year floodplains mapped by FEMA, in addition to some of the other smaller waterways within the Study Area. When railroad lines were first built in the Midwest, they were located along valley floodplains of rivers and creeks, wherever possible, to take advantage of the level and nearly level terrain, to minimize cut and fill construction operations. As such, the Study Area runs parallel to several waterways and their adjoining floodplains throughout the Study Area, in addition to crossing several floodplains at a perpendicular or skewed angle. Appendix B, Figures 1 through 162, show the floodplains near or within the Study Area.

Major flooding in the Study Area in the past quarter century has occurred in 1993, 2008, and 2011, resulting in some railroad lines being under water or washed out in some places, causing delays and closures. During the 1993 flood, IAIS reported that trains were moving at only 10 mph throughout much of the Corridor because of saturated ground (Haefner, 1996). During the 2008 flood, the IAIS Railroad operations were out of service for approximately 10 days because of flooding in Des Moines and a washout between Omaha and Des Moines. A train near Davenport wrecked when it hit a washout, and the IAIS tracks between Davenport and Iowa City were closed for 13 days (Changnon, 2009). Near Atalissa, Iowa (Muscatine County), severe damage occurred to about a mile of track that was washed out (Iowa DOT, 2008). However, the Missouri River flooding of 2011 resulted in the IAIS line becoming busier, as other railroad companies used the IAIS tracks as a detour route for their damaged tracks (Grizel, 2011).

3.18.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on floodplains are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would contribute to minimal impacts to floodplain areas. With the No-Build Alternative, there would be direct impacts on the 100-year floodplain of a perennial stream (Pond Creek) as a result of constructing new track embankment for the Wyanet Connection and on the 100-year floodplain of Indian Creek for the Eola Yard improvements. Potential culvert replacements/extensions and bridge replacements/additions would cause additional minor floodplain impacts. Specific quantitative impacts on floodplains from the

Chicago to Quad Cities Expansion Program would be determined as the project progresses through its required Tier 2 NEPA documentation. There is also the potential for temporary construction impacts from possible culvert or bridge replacements along the remainder of the rail route, as a part of ongoing maintenance.

3.18.4 Impacts of Build Alternative

Since some stretches of the existing railroad were originally built along and across the floodplains of several waterways, floodplain impacts from the Build Alternative would be unavoidable. The Build Alternative would cross and permanently encroach on several 100-year floodplain areas as a result of adding track and siding, bridge additions or replacements, and culvert replacements or extensions. Approximately 1,657 acres of 100-year floodplains are within the Potential Impact Area of the Build Alternative as shown in Table 3.18-1.

Table 3.18-1. 100-Year Floodplain Impacts

State	100-Year Floodplain (Acres)
Illinois	369
Iowa	1,273
Nebraska	15
Total	**1,657**

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW would result in fewer floodplain area impacts. Consequently, the potential for impacts to floodplains would be less during the initial implementation phase. As the Project extends westward, more impacts would occur to floodplain areas within or adjacent to the Potential Impact Area.

3.18.5 Potential Mitigation Measures

Impacts on the 100-year floodplains and regulatory floodways would be assessed during Tier 2 analysis, and would include a discussion of the no-rise requirement in regulatory floodway areas. These discussions would also include potential impacts on the natural and beneficial floodplain values, significant changes in flooding risks or damage, and the potential for incompatible floodplain development. Coordination with the SEMAs, the DNRs of each state, and local floodplain administrators would be initiated to discuss floodplain development permitting and potential mitigation measures, such as restoring natural and beneficial floodplain values by seeding with native vegetation, and proper design of bridges and culverts so as to not restrict flood flows. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.19 TOPOGRAPHY, GEOLOGY, AND SOILS

This resource includes the general topographic, geologic, and general soil conditions within the Study Area, as well as caves and mines.

3.19.1 Methodology and Regulatory Requirements

Applicable national and state regulatory framework related to geology, such as the Surface Mining Control and Reclamation Act of 1977, will be listed and addressed as they relate to the Project.

The general topographic information was compiled through review of online maps from the websites of the ISGS, the Iowa Geological and Water Survey (IGWS), and the University of Nebraska (Lincoln, Nebraska) School of Natural Resources. Information regarding the general geologic conditions, caves, sinkholes, and mining for each state was compiled from the websites of the ISGS, the IGWS, the NEMA, and the Nebraska Conservation and Survey Division (NCSD) within the University of Nebraska at Lincoln. The soils data were obtained from the NRCS and the University of Nebraska-Lincoln School of Natural Resources.

3.19.2 Affected Environment

Appendix B, Figures 1 through 162 show an aerial view of the Study Area. Although two-dimensional, topography, geology, and soils can be inferred through observing water bodies and areas with surface relief near or within the Study Area, as well as using known databases such as GIS and aerial photography.

3.19.2.1 Topography

The topography of the Study Area within Illinois is dominated by the Till Plains physiographic section, characterized by flat to gently sloping plains interspersed with areas of gently rolling hills. There are two exceptions at the east end of the Study Area with Chicago's urban area in the mostly level Chicago Lake Plain physiographic region, and Chicago's suburban area located in the Wheaton Morainal Country physiographic region characterized by rolling hills and broad ridges of deposited glacial material (ISGS, 2012).

The topography of the Study Area within Iowa is dominated by the Southern Iowa Drift Plain landform region extending over most of the southern half of the state. This landform is characterized by plains and gently to steeply rolling hills and valleys. The only constrasts occur near each end of the state in the nearly level river floodplain areas of the Mississippi and Missouri River Alluvial Plains, and at the west end of the state where the thick deposits of wind-blown silt make up the Loess Hills landform. Over the years, erosion has resulted in a landscape of peaked hills, steep side slopes, narrow ridge crests, and sometimes vertical bluffs of tan-colored exposed silt, resulting in the Loess Hills in the Council Bluffs area (Iowa DNR, 2012b, Landform Regions of Iowa). Across the Missouri River in Nebraska, the general topography of the Omaha area changes back to a rolling hills landform.

3.19.2.2 Geology

According to ISGS (Kolata, 2005) and Iowa DNR's Geological & Water Survey, (Iowa DNR, 1998 and 2004), the general underlying bedrock geology within the Study Area is predominantly sedimentary rock consisting of limestone, dolomite, sandstone, and shale.

In the Study Area, the bedrock of the Silurian Age occurs in eastern Illinois; the Ordovician Age occurs in central Illinois; and the Pennsylvanian Age occurs in western Illinois. The Iowa bedrock geologic maps and stratigraphic column indicate that the bedrock geology within the Study Area is of the Silurian and Devonian Ages in eastern Iowa, the Mississippian Age near central Iowa, and a narrow portion of Cretaceous Age bedrock within the Pennsylvanian Age region in western Iowa. In western Nebraska in the Omaha area, the bedrock is mostly limestone and shale of the Late Pennsylvanian Age (Miller, 1922).

Karst topography is characterized by caves, sinkholes, and open fractures. Geologic maps indicate that there is no bedrock at or near the surface within or near the Study Area in Illinois, and none of the karst regions of Illinois that contain caves and sinkholes are in or near the Study Area (ISGS, 2010) nor are there karst areas in the Study Area in Nebraska (NEMA, 2011).

A review of cave mapping (NSS, 2009), and karst and sinkhole mapping (Iowa DNR, 2012a Interactive Mapping), indicated that most of Iowa's major karst regions that include caves and sinkholes are located outside of the Study Area to the north. However, Iowa DNR mapping shows that the Study Area is on the southern edge of a potential karst region in the eastern portion of the state. A small portion of the potential karst areas are mapped in the Study Area in the northeast corner of Muscatine County and along the south side of the Muscatine/Cedar County line, between Wilton and West Liberty.

3.19.2.3 Underground Mining

The geologic conditions in some portions of the Study Area have also provided opportunities for surface and underground mining of mineral resources, which has occurred in both Illinois and Iowa since the mid-1800s. The potential hazard of underground mining is subsidence, in which the land above the mined out area sinks because of the collapse of the mine roof below. Coal has been the major resource extracted by underground mining in the vicinity of the Study Area. Coal mining maps for Illinois (Louchios, 2011) indicate that no known underground coal mining areas are located within the Study Area, although there is one previous surface coal mine area just east of Atkinson in Henry County. This surface mine is now abandoned, containing vegetation and pits filled with open water. Coal mining maps for Iowa (GeoCommons, 2003), indicated that eight mining entrance points are located within the Study Area in Des Moines, which had a large underground mining industry up until the mid 1900s.

According to Iowa DNR geologic information (McKay, 1987), there are three counties in the Study Area where underground limestone mines are located: Scott, Jasper, and Poweshiek. The mine in Scott County is approximately four miles from the Study Area. Information for underground limestone mine locations in the other two counties was not readily available from online resources.

Nebraska does not have a history of coal mining, and an Internet search did not retrieve any readily available information that would indicate the existence of mine locations in the Study Area in Nebraska. However, more detailed research would be conducted in the Tier 2 NEPA process to confirm the presence or absence of underground mines in the Study Area.

3.19.2.4 Soils

The majority of general soil associations (or groups) within the Study Area are divided into regions and are similar across each state, in that most were formed in loess (wind-blown soil deposits). A map of the soil regions in Illinois (NRCS, 2012b) indicates that the soils within the Study Area are dominated by silt loam and silty clay loam soils; with the exception of the Chicago urban area which also contains loam and fine sand. The alluvium (stream-deposited) soils of the Mississippi River floodplain are also silt loam and silty clay loam.

A map of the soil regions in Iowa (NRCS, 2012a) indicates that the majority of the soils in the Study Area are dominated by silt loam, silty clay loam, and clay loam soils, with the exception of the silty clay alluvium soil of the Missouri River floodplain. The soils within the Study Area in Omaha consist of the silty clay, silt loam, and loamy fine sand soils in the Missouri River floodplain and the silt loam and silty clay loam soils in the remainder of the Omaha area (UNL, 1998).

According to the NRCS, soils that are considered hydric are those soils that are sufficiently wet in the upper part to develop anaerobic conditions during the growing season. For the most part, hydric soils are formed under saturated conditions and are present in the wetland areas throughout the Study Area, indicating poor drainage or seasonal high water tables.

3.19.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on topography, geology, and soil conditions would not occur beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would contribute to minimal impacts to topography, geology, and soils. It is anticipated that there would be no impacts from topography, geology, or soils having characteristics that would adversely affect the construction of new embankment for the Wyanet Connection, Eola Yard improvements, potential culvert extensions/replacements, or bridge replacements.

3.19.4 Impacts of Build Alternative

In areas where additional ROW is required for construction of the Build Alternative, grading operations would be necessary through the flat to gentle slopes and through the gently to steeply rolling hills and valleys of the Project area. The rolling topography of the Loess Hills landform region would be encountered in the area just east of Council Bluffs, Iowa. The Build Alternative would have linear impacts on the Loess Hills landform area as a result of adding track and siding in the northeast portion of Council Bluffs, Iowa, and it is anticipated that the linear impacts would be minimal. An additional area of impact in the Loess Hills would result from a potential new station location just southeast of the intersection of I-80 and Highway 6, in the northeast corner of Council Bluffs (Figures 156 and 157). A new station facility in this area would result in impacts to this resource by removing the natural landform on this property, and replacing it with a building and parking facilities. These topographic conditions are not expected to pose an adverse challenge since the alternative is adjacent to an existing railroad grade and minimal cut and fill would be required. However, one of Iowa DOT's special provisions for construction states that land disturbance within the Loess Hills region for the use of borrow material should be avoided or minimized unless there is no practicable alternative (Iowa DOT, 2010b).

Although the Build Alternative would impact a potential karst area near the east end of the Iowa portion of the Project, it is at the edge of this potential karst area and is a relatively small portion of the entire Study Area. Bedrock encountered in the Potential Impact Area would increase construction costs, but would not be an insurmountable challenge for the project. The Build Alternative would not impact the underground mining entrances located in the Des Moines, Iowa area, however, the potential for karst terrain and mining subsidence are considerations that would be investigated further in the Tier 2 NEPA process.

The grading operations of the Build Alternative would impact various soil types in the Potential Impact Area, most of which are silt loams and silty clay loams, which would not pose adverse construction challenges. Although the silty clay soils of the Missouri River floodplain have a high shrink-swell potential, and hydric soils in wetland areas would require proper drainage prior to construction, these conditions are not anticipated to be adverse challenges to building additional railroad facilities. Because the soils of the Loess Hills area are highly prone to erosion in cut areas, considerations for proper slope and erosion control measures would be necessary in the design stage. During the design process, specific soil types within the project construction area will be determined, as well as the engineering limitations of those soils in relation to new siding placement and the design of new facilities at station locations.

Topographic, geologic, and soil conditions would be taken into further consideration as the Project progresses into the Tier 2 analyses and particularly into design.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements a would result in fewer impacts on or from topography, geology, and soils. Consequently, the potential for impacts on or from topography, geology, and soils would be less during the initial implementation phase. As the Project extends westward, more impacts would occur to or from topography, geology, and soils within or adjacent to the Potential Impact Area.

3.19.5 Potential Mitigation Measures

No requirements for mitigation related to topographic, geologic, and soil conditions are anticipated, with the exception of impacts on the Loess Hills area. According to Iowa DOT, areas in the Loess Hills with native vegetation should be given priority for avoidance and minimization. Cultivated land and previously disturbed land can receive less consideration. If borrow sites or land disturbance within the Loess Hills area are unavoidable, coordination should take place with Iowa DNR regarding possible mitigation measures such as buffer zones adjacent to areas of native vegetation. Mitigation measures could also include shaping disturbed or borrow areas to blend into the natural character of the surrounding hills (Iowa DOT, 2010b). Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.20 NATURAL HABITATS AND WILDLIFE

This resource includes various types of natural terrestrial habitats and the wildlife that uses these habitats. Natural areas may be lands designated by Congress or federal or state agencies as wildlife refuges, waterfowl production areas, wildlife management areas, nature preserves, high quality natural communities, natural areas, and wildlife sanctuaries. On the state level, natural areas are public lands managed by Illinois DNR, Iowa DNR, or the Nebraska Game and Parks Commission (NGPC).

3.20.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to natural habitats and wildlife include the Fish and Wildlife Coordination Act of 1934 (as amended) (FWCA), the Migratory Bird Treaty Act of 1918 (as amended) (MBTA), the Pittman-Robertson Act of 1937 (PRA), the Wilderness Act of 1964 (WA), and the Bald and Golden Eagle Protection Act of 1940 (as amended) (BGEPA). In addition, each state has regulations pertaining to wildlife and habitat, such as the Illinois Wildlife Code (520 ILCS 5/), the Illinois Endangered Species Protection Act (520 ILCS 10/11(b)), Illinois Natural Areas Preservation Act (525 ILCS 30/17), and administrative rules promulgated there under (17 Ill. Adm. Code Part 1075), the Iowa Code (Chapter 481A Wildlife Conservation), and Title 163 (NGPC) of the Nebraska Administrative Code (Chapter 4 Wildlife Regulations). Natural habitats and wildlife are also protected under the Endangered Species Act (ESA) of 1973, which is discussed in Section 3.21.

The MBTA and the BGEPA were implemented to offer protection to avian species. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell migratory birds; and the BGEPA prohibits anyone from taking bald or golden eagles, including their parts, nests, or eggs, without a permit issued by the Secretary of the Interior. Among other actions, "take" includes disturbance of eagles to the degree that it substantially interferes with breeding, feeding, or sheltering behavior, or results in injury, death, or nest abandonment. In addition to protection from direct harm, the BGEPA also prohibits activities that disrupt eagles at nests, foraging areas, and important roosts because loss of these areas can disturb or kill eagles.

During the scoping process for this Study, letters were sent to Illinois DNR, Iowa DNR, and NGPC to invite the agencies to provide input and data relating to high-quality natural communities, managed natural areas, and general wildlife habitat types and locations. During the scoping process, Illinois DNR offered to perform an EcoCAT[14] review within two miles on each side of the centerline of the Study Area and provided GIS Natural Heritage Database information regarding natural areas, including high quality natural communities, Illinois Natural Areas Inventory (INAI) sites, and land enrolled in Illinois Nature Preserves Commission (INPC) land protection programs (Nature Preserves and Land and Water Reserves). Iowa DOT provided GIS database information gathered from Iowa DNR, including natural areas, wildlife management areas, and past and present forest stand areas.

[14] EcoCAT is the Ecological Compliance Assessment Tool of Illinois DNR, developed to help state agencies and units of local government comply with threatened and endangered species requirements. The system uses databases, GIS, and a set of programmed decisions to help identify the presence of and potential impact on threatened and endangered species.

The NGPC Nebraska Heritage Program website (NGPC, 2012) was reviewed and it was determined that there are no listed natural areas within the Study Area in Nebraska. General wildlife information on the websites of Illinois DNR, Iowa DNR, and NGPC was also obtained. The websites of the Illinois Forest Preserve Districts by county were used to obtain forest preserve locations. Information regarding the location of national wildlife refuges was obtained from the USFWS.

3.20.2 Affected Environment

Over the years, intensive agriculture and development have fragmented and reduced the amount of woodland and prairie habitat available for wildlife, and have decreased the quality of the wildlife habitat areas that remain. Each state has developed a proactive wildlife action plan (comprehensive wildlife action strategy) to assess the health of wildlife and to determine strategies to conserve the numerous wildlife species of each state, including a full array of wildlife as well as those in greatest need of conservation, and their associated habitats (Illinois DNR, 2005; Iowa DNR, 2012; NGPC, 2005). These habitats provide food and shelter for over a thousand species in each state, including mammals, birds, fish, reptiles, amphibians, mussels, and snails, as well as several thousand insect species (see Appendix M for species lists). Although not an all inclusive list, some of the most common wildlife species (excluding insects) that can be seen inhabiting the region surrounded by the Study Area generally include the following:

- Mammals – opposum, raccoon, cottontail rabbit, red fox, gray squirrel, white-tailed deer
- Birds – cardinal, blue jay, purple martin, robin, wild turkey, ruffed grouse, quail, mallard duck, Canada goose
- Reptiles – eastern garter snake, bull snake, ornate box turtle
- Amphibians – spotted salamander, northern leopard frog
- Fish – green sunfish, smallmouth bass, channel catfish, flathead catfish
- Invertebrates – giant floater mussel, common mucket, garden snail

Each state has compiled lists of specific natural areas or natural communities that provide habitat for the region's wildlife population, which are shown in Appendix M, Table 1 and displayed on Appendix B, Figures 1 through 162. Appendix M, Table 1 also indicates the type of habitat that is characteristic within the Study Area, including: woodlands (upland and riparian), savanna, prairies/grassland, shrubland, and aquatic habitat. Illinois DNR has compiled a list of INAI sites, which are categorized as follows:

- Category I – High quality natural community and natural community restorations
- Category II – Specific suitable habitat for state-listed species or state-listed species relocations
- Category III – State dedicated Nature Preserves, Land and Water Preserves, and Natural Heritage Landmarks
- Category IV – Outstanding geological features
- Category V – Unusual concentrations of flora or fauna and high quality streams

The INPC's land protection program consists of a list of Nature Preserves, Land and Water Reserves, and Natural Heritage Landmarks. Appendix M, Table 1 lists one INPC site, in addition to INAI Category I, II, and III areas located within the Study Area in Illinois. There

are also forest preserves within the Study Area in Illinois, which are under the jurisdiction of the forest districts of Cook, DuPage, and DeKalb counties.

Iowa DNR has compiled a list of nature preserves throughout the state, but none are within or adjacent to the Study Area. However, a review of Iowa DNR data provided by Iowa DOT indicated that remnant prairies on public lands, wildlife management areas, and other natural areas exist within the Study Area in Iowa. Although there are no designated "state forests" located within the Study Area in Iowa, certain past and present forest stand areas (originally described by district foresters in forest stewardship and project plans), which are currently managed, protected, or under development by Iowa DNR; also occur within the Study Area.

The largest natural habitat in the Study Area is the USFWS Port Louisa National Wildlife Refuge, which occurs along the wide Iowa River floodplain in Iowa County, Iowa near Marengo (Appendix B, Figures 82 through 85). The Refuge is approximately two miles in width and 42 miles in length, extending through Iowa County and into Tama County to the northwest. Approximately 10.5 miles of the Refuge property travels through the Study Area, and although most of the Refuge is on the north side of the railroad ROW, a relatively small portion is also on the south side. It is managed by Iowa DNR and is comprised of several thousand acres of wildlife habitat that includes riparian woodland, savanna (mix of grassland with scattered trees), and grassland.

The Study Area in Nebraska contains no listed natural areas, with the exception of the Missouri River.

In addition to the Mississippi and Missouri rivers listed in Appendix M, Table 1, the aquatic resources within the Study Area that provide natural habitat for fish, invertebrates (such as mussels), and amphibian species include the numerous streams, wetlands, lakes, and ponds that are discussed in Sections 3.15 and 3.16. Several of the natural areas listed in Appendix M, Table 1 also have streams running through the properties.

The east-west trending Study Area is located in the north-south trending bird migration route through Illinois, Iowa, and the Missouri River corridor known as the Mississippi Flyway, which is used yearly by land birds, shore birds, and water fowl. Acording to information from Illinois DNR, the Mississippi River riparian corridor in the Study Area is suitable habitat for bald eagles, which were observed in the area in 2004 and 2009. The potential for occurrences of migratory bird nesting, foraging, or roosting areas would be studied further in the Tier 2 NEPA documents.

3.20.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts to natural habitats and wildlife would not occur beyond those that could occur due to other projects. The Chicago to Quad Cities Expansion Program would result in potential minor impacts to terrestrial as well as aquatic habitats and wildlife as a result of constructing new track embankment for the Wyanet Connection, in addition to potential culvert replacements/extensions and minor bridge replacements/additions. The Eola Yard improvements may also result in minor impacts on aquatic habitats. Field reviews will be conducted as the Chicago to Quad Cities Expansion Program progresses through the Tier 2 NEPA process to determine the presence or absence of wildife or their habitats. To improve site distance at crossings for vehicle and train traffic, tree and brush clearing is expected to

occur, which could impact natural habitats that may be present in the impact area. Specific clearing and impact areas will be identified during the Chicago to Quad Cities Tier 2 NEPA analysis as more specific project limits are identified.

The wildlife species that may be present in the region of the Study Area have been continually exposed to train traffic in varying degrees. The number of existing trains (in trips per day) that travel through the urban and rural areas between Chicago and the Quad Cities are listed below. The existing freight train traffic does not travel faster than 45 mph, and the existing passenger train traffic averages 60 to 70 mph (Chicago to Wyanet).

- Chicago to Aurora, Illinois (urban) – 102 passenger, 40 freight
- Auroa to Wyanet, Illinois (rural) – 8 passenger, 24 freight
- Wyanet to Silvis, Illinois (rural) – 7 freight
- Silvis to Moline, Illinois/Quad Cities (urban) – 15 freight

With the Chicago to Quad Cities Expansion Program, there would be an additional four passenger trains per day at 79 mph. The number of noise and vibration occurrences generated by the trains would increase minimally over the number of noise and vibration occurences of the existing train traffic between Chicago and Wyanet. However, in the rural area between Wyanet and Silvis, there would be an increase of over 50 percent in the number of trains per day, and in the urban area between Silvis and Moline/Quad Cities, there would be an approximate 25 percent increase in trains. Although some animal species may become accustomed to the resulting train noise and vibration, other species may not. Some animals may simply take notice and change body position, while others may panic and take flight or run (Harris Miller Miller & Hanson, Inc., 2005; and California High-Speed Rail Authority, 2008). Although there are very few studies that have directly evaluated the impact of train noise and vibration on wildlife, other noise studies have reported that noise levels in the vicinity of 100 dB have been associated with observable effects on animals (Harris Miller Miller & Hanson, Inc., 2005). The potential effects of noise and vibration on wildlife, which can vary considerably among various species, will be further analyzed during the Tier 2 NEPA process for this alternative when the resident species and potential migratory bird species can be determined for the individual Tier 2 sections.

Although no online published data were readily available, pertaining to numbers of train and wildlife collisions, those types of accidents can occur at any time, and have a tendency to be most prevalent in the winter months when wildlife can more easily move along the plowed railroad right-of-way (USFWS, 2004). It is anticipated that the increase in the frequency of trips and speed of train traffic may consequently increase the potential for train collisions with mobile animal species and migratory birds, however, this issue will be further analyzed in the Tier 2 NEPA document.

The current rail routes between Chicago and Omaha would continue to be used. Existing environmental impacts such as erosion and sedimentation from railroad grades to adjacent water resources, and potential pollutant runoff and spills from operational and maintenance activities would continue to affect any natural habitat and wildlife species that may be present adjacent to the rail corridor. There is also the potential for temporary construction impacts from future culvert or bridge replacements along the remainder of the rail route, as a part of ongoing maintenance.

3.20.4 Impacts of Build Alternative

The construction activities of the Build Alternative—including tree and brush clearing, placement of fill material for additional track and sidings, stream relocations, culvert replacement or extensions, and bridge replacement or additions—could have the potential to impact terrestrial and aquatic natural habitats of wildlife species present in the Study Area. Tree and brush clearing would be necessary to construct additional track and embankment, and to improve site distance at crossings for vehicle and train traffic. This clearing would impact natural habitats and may consequently impact the wildlife species that inhabit those areas.

Adjacent natural communities were historically fragmented by construction of the existing railroad alignment. Since the proposed widening activities abut the existing ROW, impacts from the Build Alternative would be relatively minimal and linear, and would not further fragment remaining large parcels of natural habitat areas.

Embankment placed in wetlands, lakes, and ponds; stream relocations; culvert replacement or extensions; and bridge replacement or additions would directly impact aquatic species habitats. In addition, temporary disruptions of aquatic species movement and hydrological flow could occur, thereby affecting in-stream habitats both upstream and downstream of the Project.

Appendix M, Table 2 lists the natural areas that would be directly impacted by construction of the Build Alternative within the Potential Impact Area. It is estimated that approximately 178 acres of natural terrestrial habitat areas would be directly impacted, in addition to 104,150 linear feet of stream habitat, 238 acres of wetland habitat, 32 acres of lakes, and 33 acres of ponds (Table 3.20-1).

Table 3.20-1. Natural Habitat Area Impacts

Habitat Type	Illinois	Iowa	Nebraska	Total
Terrestrial (in Acres)				
Upland Woods	7	17	0	**24**
Riparian Woodland	0	8	0	**8**
Savanna/Upland Woods/Grassland Mix	0	19	0	**19**
Savanna/Riparian Woods/Grassland Mix	0	111 [a]	0	**111**
Riparian Shrubland	0	1	0	**1**
Prairie/Grassland	0	11	0	**11**
Prairie (High Quality Natural Community)	4	0	0	**4**
Riverine (Bridged)	0	0	0	**0**
Total				**178**
Aquatic				
Streams (Linear Feet)	34,240	69,595	315	**104,150**
Wetlands (Acres)	31	193	14	**238**
Lakes (Acres)	5	27	0	**32**
Ponds (Acres)	4	27	2	**33**

Note:

[a] *The USFWS Port Louisa National Wildlife Refuge accounts for +/- 109 acres.*

The majority of natural habitat impacts would occur at the USFWS Port Louisa National Wildlife Refuge property since it abuts both sides of the rail corridor for 10.5 miles. Impacts to the Refuge property would most likely be unavoidable. Minimization of impacts would be analyzed in the Tier 2 NEPA process when more specific project limits can be identified through engineering refinements.

Some natural areas within the Study Area that are not directly within the Potential Impact Area could be affected by other aspects of the Project as described below.

The wildlife species that are present along the rail corridor have been continually exposed to train traffic in varying degrees. The number of existing trains (in trips per day) that travel through the urban and rural areas between Chicago and Omaha are listed below. The existing freight train traffic does not travel faster than 45 mph, and the existing passenger train traffic averages 60 to 70 mph (Chicago to Wyanet).

- Chicago to Aurora, Illinois (urban) – 102 passenger, 40 freight
- Auroa to Wyanet, Illinois (rural) – eight passenger, 24 freight
- Wyanet to Silvis, Illinois (rural) – seven freight
- Silvis to Moline, Illinois/Quad Cities (urban) – 15 freight
- Moline/Quad Cities to Iowa City, Iowa (rural & urban) – six to eight freight
- Iowa City to Des Moines, Iowa (rural & urban) – six to eight freight
- Des Moines to Council Bluffs, Iowa (rural) –five freight
- Council Bluffs, Iowa/Omaha, Nebraska (urban) – 60 freight

With the Build Alternative, there would be an additional 14 passenger trains per day at up to 110 mph between Chicago and Des Moines, with 10 of these trains continuing to Omaha. The number of noise and vibration occurences generated by trains would increase minimally over the number of noise and vibration occurrences of the existing train traffic between Chicago and Wyanet and in the Omaha/Council Bluffs area. However, in the rural areas from Wyanet to Silvis, there would be three times the number of trains per day, and in the urban area between Silvis and Moline/Quad Cities, there would be an approximate 100 percent increase in trains. From the Quad Cities to Council Bluffs, the number of noise and vibration occurrences generated by trains would triple. As discussed previously under the No-Build Alternative impacts section (3.20.3), some animal species may become accustomed to these noise and vibration occurrences, while others may not. At this Tier 1 level of study, the location and density of wildlife is unknown, as are the individual species. More detailed investigations of the effects of noise and vibration on wildlife would be performed in the Tier 2 NEPA documents when train speed, noise, and vibration can be more accurately calculated, and when field surveys identifying potentially affected wildlife can be performed.

As discussed previously in Section 3.20.3, Impacts of No-Build Alternative, it is anticipated that the increase in the frequency of trips and speed of train traffic may increase the potential for train collisions with mobile animal species and migratory birds; however, this issue would be further analyzed in the Tier 2 NEPA documents.

The increase in train traffic and railroad ROW could also increase the chances of impacts from erosion and sedimentation from railroad grades to adjacent aquatic habitat, and potential pollutant runoff and spills from operational and maintenance activities, which could affect natural habitats and the water quality of aquatic habitats that may be present adjacent

to the rail corridor. However, permanent BMPs would provide measures to avoid or minimize those types of impacts. There is also the potential for temporary construction impacts from future culvert or bridge replacements along the remainder of the rail route, as a part of ongoing maintenance.

Land disturbance, wetland disturbance, tree and brush clearing, and culvert and bridge replacements could affect potential migratory bird and/or eagle nesting, foraging, or roosting areas that may be present in the Study Area. The Illinois DNR has identified the Mississippi River riparian corridor as suitable habitat for bald eagles, which have been previously documented in that portion of the Study Area. Also the NGPC has identified bald eagles in the Missouri River corridor. Specific locations requiring clearing or structure removal would be identified during the Tier 2 NEPA analysis when a more specific extent of project limits would be determined. At that time, coordination with the Illinois DNR, Iowa DNR, and NGPC would take place to determine potential locations of migratory bird and/or eagle occupancy within the Study Area, in addition to determining seasonal nesting, roosting, and foraging requirements of potentially affected species. To comply with the MBTA and the BGEPA, restrictions may be placed on the timing of clearing and other construction disturbance activities, to help ensure avoidance or minimization of impacts.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer impacts on terrestrial and aquatic habitat, less noise and vibration effects on wildlife, and potentially fewer train/animal collisions than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, impacts on natural habitats and wildlife would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to natural habitats and wildlife within or adjacent to the Potential Impact Area.

3.20.5 Potential Mitigation Measures

Data specific to the study would be obtained through coordination with the Illinois DNR, Iowa DNR, and NGPC during the Tier 2 NEPA process. The existing information regarding natural terrestrial and aquatic habitat would be used as background data for conducting field surveys to determine existence of high quality natural communities in the Study Area. During the Tier 2 process, avoidance and minimization of impacts would be assessed, and unavoidable impacts to natural habitats would be coordinated with the state agencies to determine compliance with regulatory requirements and potential mitigation measures to offset impacts, which could include restrictions on construction activities in specific areas during the breeding/nesting seasons. In addition, permanent BMPs would be implemented to provide measures to avoid or minimize those types of impacts.

The Tier 2 NEPA process would also include coordination with Iowa DNR regarding mitigation of woodland impacts according to Iowa Code 314.23, Environmental Protection, which requires woodland replacement by "… plantings as close as possible to the initial site, or by acquisition of an equal amount of woodland in the general vicinity for public

ownership and preservation, or by other mitigation deemed to be comparable to the woodland removed, including, but not limited to, the improvement, development, or preservation of woodland under public ownership."

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.21 THREATENED AND ENDANGERED SPECIES

This evaluation includes threatened and endangered species listed by the USFWS and Designated Critical Habitats (DCHs), and consideration of state-listed threatened and endangered species.

3.21.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to threatened and endangered species includes the ESA of 1973, administered by USFWS. In addition, state-listed species are regulated by the Illinois Endangered Species Protection Act (520 Illinois Compiled Statutes [ILCS] 10), administered by the Illinois DNR as advised by the Illinois Endangered Species Protection Board; the Iowa Endangered Plants and Wildlife Law (Chapter 481B of the Code of Iowa), administered by the Iowa Natural Resources Commission and Iowa DNR; and the Nebraska Nongame and Endangered Species Conservation Act (Neb. Rev. Stat.§§ 37-801-11), administered by the NGPC.

The USFWS website provides information on federally listed threatened and endangered species and DCHs. The Illinois DNR, Iowa DNR, and NGPC websites also provide data relating to state-listed threatened and endangered species. In addition, the Illinois DNR offered to perform an ECOCAT review and provided GIS Natural Heritage Database information regarding general locations within 2 miles of the Study Area centerline of federally and state-listed threatened and endangered species, high quality natural communities, and INAI sites. The INAI sites included Category II – specific suitable habitat for state-listed species or state-listed species relocations.

3.21.2 Affected Environment

The compiled data for federally and state-listed threatened and endangered species were reviewed to describe the affected environment. The ESA defines endangered species as those that are "in danger of extinction within the foreseeable future throughout all or a significant portion of [their] range," and defines threatened species as "those animals and plants likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges" (16 USC 1531 et seq.). Vertebrate animal species and subspecies, invertebrate animal populations, and plant species and varieties (including fungi and lichens) are eligible for listing under the ESA.

3.21.2.1 Federally Listed Threatened and Endangered Species

USFWS currently lists 16 threatened or endangered species that occur, or have the potential of occurring, in the specific counties of the Study Area, as shown in Table 3.21-1.

Table 3.21-1. Federally Listed Threatened and Endangered Species

Common Name	Scientific Name	Status	Counties	Designated Critical Habitat (DCH)	Habitat Description
Decurrent false aster	*Boltonia decurrens*	T	LaSalle & Bureau, IL	None	Disturbed alluvial soils
Leafy prairie clover	*Dalea foliosa*	E	Cook, DuPage, & LaSalle, IL	None	Prairie remnants on thin soil over limestone
Hine's emerald dragonfly	*Somatochlora hineana*	E	Cook & DuPage, IL	Calcareous (high in calcium carbonate) spring-fed marshes and sedge meadows overlaying dolomite bedrock, along and near the Des Plaines River in Cook and DuPage Counties, Illinois.	Spring-fed wetlands, wet meadows and marshes
Mead's milkweed	*Asclepias meadii*	T	Cook & DuPage, IL & Adair, IA	None	Virgin prairies
Spectaclecase mussel	*Cumberlandia monodonta*	E	Rock Island, IL & Scott & Muscatine, IA	None	Large Rivers (Mississippi River) in areas sheltered from the main force of the current
Higgins eye pearlymussel	*Lampsilis higginsi*	E	Rock Island, IL & Scott & Muscatine, IA	None	Mississippi River from Rock River to Steel Dam
Prairie bush clover	*Lespedeza leptostachya*	T	Cook & DuPage, IL & Scott, Muscatine, Cedar, Johnson, Iowa, Poweshiek, Jasper, Polk, Dallas, Madison, Guthrie, Adair, Cass & Pottawattamie, IA	None	Dry to mesic prairies with gravelly soil
Indiana bat	*Myotis sodalis*	E	Kendall, DeKalb, LaSalle, Bureau, Henry & Rock Island, IL & Scott, Muscatine, Cedar, Johnson, Iowa, Poweshiek, Jasper, Polk, Dallas, Madison, Guthrie, Adair, & Cass, IA	Blackball Mine, located in the Pecumsaugan Creek-Blackball Mines Nature Preserve in LaSalle County, Illinois.	Caves and mines (hibernacula); upland forests and small stream corridors with well developed riparian woods (foraging and roosting).
Eastern prairie fringed orchid	*Platanthera leucophaea*	T	Cook, DuPage, Kane, Kendall, DeKalb, LaSalle, Bureau, Henry & Rock Island, IL & Johnson, IA	None	Mesic to wet prairies

Common Name	Scientific Name	Status	Counties	Designated Critical Habitat (DCH)	Habitat Description
Sheepnose mussel	*Plethobasus cyphyus*	E	Rock Island, IL & Scott & Muscatine, IA	None	Shallow areas in larger rivers and streams (Mississippi River and possibly Rock River)
Topeka shiner	*Notropis topeka*	E	Dallas, IA	The North Raccoon River and adjacent off-channel and side channel pools, Elm Branch, and Swan Lake Branch in Dallas County, Iowa.	Prairie streams and rivers
Piping plover	*Charadrius melodus*	E	Cook, IL & Pottawattamie, IA	None	Wide, flat, open sandy beaches with very little grass or other vegetation.
		T	Douglas, NE	None	(Missouri River) Nesting territories often include small creeks or wetlands.
Western prairie fringed orchid	*Platanthera praeclara*	T	Scott, Muscatine, Cedar, Johnson, Iowa, Poweshiek, Jasper, Polk, Dallas, Madison, Guthrie, Adair, Cass & Pottawattamie, IA & Douglas, NE	None	Wet prairies and sedge meadows
Pallid sturgeon	*Scaphirhynchus albus*	E	Pottawattamie, IA & Douglas, NE	None	Missouri River
Interior least tern	*Sterna antillarum*	E	Polk & Pottawattamie, IA & Douglas, NE	None	Bare alluvial and dredged spoil islands. Barren to sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines
Whooping crane	*Grus americana*	E	Douglas, NE	None	(During migration) sparsely vegetated shallow water in wetlands, lakes, ponds, and riverine areas, away from human activity

Sources: Illinois – http://www.fws.gov/midwest/endangered/lists/illinois-cty.html (March 2012)
Iowa – http://www.fws.gov/midwest/endangered/lists/iowa_cty.html (March 2012)
Nebraska – http://www.fws.gov/nebraskaes/Library/NECounty2012.pdf (February 2012)
Notes: E = Endangered, T = Threatened

Although the species listed above have the potential to occur in various suitable habitats in the Study Area, their presence or absence has not been determined in this Tier 1 study. However, the natural habitats in the Study Area that are known to have the potential for suitable habitat for federally listed threatened or endangered species include the following:

- *Rock River* – Sheepnose mussel (*Plethobasus cyphyus*) (endangered) – Rock Island and Henry counties, Illinois
- *Mississippi River* – Higgins eye pearlymussel (*Lampsilis higginsii*) (endangered), Spectaclecase mussel (*Cumberlandia monodonta*) (endangered), sheepnose mussel (endangered) – Rock Island County, Illinois, and Scott County, Iowa
- *North Raccoon River* – DCH for the Topeka shiner (*Notropis topeka*) (endangered) – Dallas County, Iowa
- *Missouri River* – Piping plover (*Charadrius melodus*) (endangered in Iowa, threatened in Nebraska), pallid sturgeon (*Scaphirhynchus albus*) (endangered) – Pottawattamie County, Iowa, and Douglas County, Nebraska

3.21.2.2 State Listed Threatened and Endangered Species

In addition to federally listed species, there are also threatened and endangered species listed by each state, that occur or have the potential of occurring in the specific counties of the Study Area, as shown in Appendix N Table 1 and the lists of species following Table 1. Potential habitat for state-listed species in Illinois counties in the Study Area ranges from a high of 69 endangered species and 43 threatened species in Cook County, to a low of five endangered species and five threatened species in DeKalb County. In Iowa, potential habitat ranges from a high of 35 endangered species and 34 threatened species in Muscatine County, to a low of zero endangered species and two threatened species in Cass County. Douglas County, Nebraska includes potential habitat for three endangered species and four threatened species.

In this Tier 1 analysis, occurrence locations of state-listed species were not available from Iowa DNR and NGPC. However, Illinois DNR provided Natural Heritage Database information, which indicated that the following state-listed species are located within the Study Area, as shown in Table 3.21-2.

Table 3.21-2. Illinois State-Listed Threatened and Endangered Species in Study Area

Common Name	Scientific Name	Federal Status	State Status	County
Peregrine Falcon	*Falco peregrinus*		T	Cook
Blanding's Turtle	*Emydoidea blandingii*	-	E	Cook
Pretty Sedge	*Carex woodii*	-	T	Du Page
Shadbush	*Amelanchier interior*	-	T	Du Page
Common Moorhen	*Gallinula chloropus*	-	E	Du Page
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	-	E	Du Page, Bureau
Black-crowned Night-Heron	*Nycticorax nycticorax*	-	E	Du Page
Greater Redhorse	*Moxostoma valenciennesi*	-	E	Kane
Earleaf False Foxglove	*Agalinis auriculata*	-	T	Henry
Black Sandshell	*Ligumia recta*		T	Rock Island
Higgins Eye Pearlymussel	*Lampsilis higginsi*	E	E	Rock Island

Source: Illinois DNR – Natural Heritage Database

Notes:

E = Endangered, T = Threatened,

The INAI lists the following three natural habitats within the Study Area, designated as Category II – specific suitable habitat for state-listed species or state-listed species relocations:

- *Maple Grove Forest Preserve* (INAI #0527) – contains habitat for the pretty sedge and shadbush, which is state-listed as threatened– Du Page County, Illinois
- *Eola Road Marsh* (INAI #1470) – contains habitat for the common moorhen, yellow-headed blackbird, black-crowned night heron, and blanding's turtle, which are state-listed as endangered – Du Page County, Illinois
- *Mississippi River, Moline* (INAI #1295) – contains habitat for the Higgins eye pearlymussel, which is federally and state-listed as endangered, and the black sandshell (mussel), which is state-listed as endangered – Rock Island County, Illinois

3.21.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on federally or state-listed threatened or endangered species would not occur beyond those that could occur due to other projects. It is anticipated that the Chicago to Quad Cities Expansion Program would have no adverse effects on federally listed species, and may have potential minor impacts to state-listed species, if only temporary, as a result of constructing potential culvert replacements/extensions, bridge replacements/additions, and track and embankment improvements in the vicinity of state-listed species occurrences. New track embankment for the Wyanet Connection would most likely not affect any state-listed species. However, the Eola Yard improvements could potentially result in minor linear impacts to the Eola Road Marsh, which is suitable habitat for state-listed species. Field reviews would be conducted as the Chicago to Quad Cities Expansion Program progresses through the Tier 2 NEPA process to determine the presence or absence of threatened or endangered species, or their habitats.

Specific clearing and impact areas would be identified during Tier 2 analysis as more specific project limits are identified.

Although there is no DCH for federally listed species within the Chicago to Quad Cities study area, some state-listed species have been recorded. Those that may be present along the study area have been continually exposed to train traffic in varying degrees. The discussion regarding the potential effects of noise and vibration on wildlife in Section 3.20.3, also pertains to the state-listed species.

The increase in train traffic may consequently increase the potential for train collisions with mobile state-listed animal species, if any would happen to be present in the Study Area. However, information regarding train/wildlife collisions is not readily available online as discussed in Section 3.20.3, but this issue will be further analyzed in Tier 2 NEPA documents. Between Wyanet and Moline/Quad Cities, there are no federally or state-listed species occurrences within the Study Area, and operation of the rail would most likely not have an adverse effect on any federally or state-listed threatened or endangered species.

The discussion in Section 3.20.3, regarding potential impacts from erosion and sedimentation, pollutant runoff and spills, and temporary construction impacts also pertains to federally and state-listed species that may be present in the Study Area.

3.21.4 Impacts of Build Alternative

3.21.4.1 Federally Listed Threatened and Endangered Species

The Build Alternative would have no direct impacts on the DCH of any federally listed threatened or endangered species. As shown on Figure 60, the Study Area is located approximately 1,200 feet downstream of the confluence of the North Raccoon, South Raccoon, and Raccoon rivers. The North Raccoon River is DCH for the Topeka shiner (*Notropis topeka)*. Further analysis in Tier 2 NEPA studies would be necessary to determine if the Topeka shiner habitat extends further downstream into the Study Area.

The Build Alternative would cross the Rock River, Mississippi River, and the Missouri River, which are suitable habitat for the five federally listed species discussed previously within the existing affected environment. It is anticipated that no new bridge structures would be required over the Rock River and Mississippi Rivers, and therefore no direct or adverse impacts on those species would occur in these river corridors. However, it is possible that one or more new bridge structures could be needed across the Missouri River between Council Bluffs, Iowa, and Omaha, Nebraska. Consequently, consultation with the USFWS, Iowa DNR, and NGPC would be required during Tier 2 analysis to address potential impacts to threatened and endangered species in this portion of the alternative.

The presence of most of the habitat types that are suitable for the federally listed species in the Study Area would not be determined until Tier 2 analysis for the Project. However, it is likely that the upland and riparian woodland areas in the Iowa counties of the Study Area may potentially provide suitable foraging and roosting habitat for the endangered Indiana bat (*Myotis sodalis*), although there is no DCH for this species in the Study Area. The Build Alternative would result in impacts to wooded areas, as discussed in Section 3.20. However, impacts would be linear and minimal, rather than fragmenting large parcels of wooded areas,

and would not conribue to further fragmentation since the proposed alternative would directly abut the existing ROW.

The construction activities of the Build Alternative, including tree and brush clearing, placement of fill material for additional track and siding, stream relocations, culvert replacement or extensions, and bridge replacement or additions, could have the potential to impact terrestrial and aquatic habitats of federally listed threatened or endangered species, if present.

The presence or absence of federally listed threatened and endangered species is not known at this time. However, field surveys and coordination with the USFWS and state resource agencies would take place during the Tier 2 studies, when more specific project limits would be identified, to determine the potential for threatened or endangered species in the Study Area, and the potential for avoidance or minimization of impacts on any species that may be present.

The discussion in Section 3.20.4, regarding potential effects of noise and vibration on wildlife also pertains to federally-listed species that may be present in the Study Area. At this Tier 1 level of study, the specific locations of federally-listed species are unknown. More detailed investigations would be performed in the Tier 2 documents when train speed, noise, and vibration can be more accurately calculated, and when field surveys identifying the presence or absence of federally-listed species can be performed. The discussion in Section 3.20.4 also pertains to the potential for train collisions with federally-listed species, as well as potential impacts from erosion and sedimentation, pollutant runoff and spills, and temporary construction impacts.

At the Tier 1 level, it is anticipated that the potential impacts on federally listed threatened or endangered species from the Build Alternative would not result in adverse effects (impacts that are likely to jeopardize the continued existence of the species or destroy or adversely modify critical habitat). This conclusion is based on the fact that the Build Alternative would stay within, or immediately adjacent to existing rail infrastructure, which minimizes the potential for adverse impacts. However, since there is a potential for federally listed threatened or endangered species occurrences in the Study Area, there is a need for Section 7 consultation with USFWS during Tier 2 analysis. The USFWS has participated in the Project scoping process and would continue to be consulted during the Tier 2 NEPA process, where construction-related effects and activities of the Build Alternative would be more definitively assessed to determine whether or not there would be an adverse effect on federally listed threatened or endangered species. Illinois DNR, Iowa DNR, and NGPC would also be involved in these future coordination efforts.

3.21.4.2 State-Listed Threatened and Endangered Species

The construction activities of the Build Alternative, including tree and brush clearing, placement of fill material for additional track and siding, stream relocations, culvert replacement or extensions, and bridge replacement or additions, could potentially impact state-listed threatened or endangered species. However, the presence or absence of these species along most of the Study Area is not known at the Tier 1 level of analysis, with the exception of the Study Area in Illinois, as discussed below and shown in Table 3.21-3. Field surveys and coordination with Illinois DNR, Iowa DNR, and NGPC would take place during

the Tier 2 NEPA studies to determine the potential for the existence of state-listed threatened or endangered species in the Study Area, specific clearing and impact areas, and the potential for avoidance or minimization of impacts on any species that may be present.

The discussion in Section 3.21.4.1 above, and Section 3.20.4, regarding potential effects of noise and vibration on wildlife also pertains to state-listed species that may be present in the Study Area. At this Tier 1 level of study, the specific locations of state-listed species are unknown. More detailed investigations would be performed in the Tier 2 NEPA documents when train speed, noise, and vibration can be more accurately calculated, and when field surveys identifying the presence or absence of state-listed species can be performed. The discussion in Section 3.20.4 also pertains to the potential for train collisions with state-listed species, as well as potential impacts from erosion and sedimentation, pollutant runoff and spills, and temporary construction impacts.

Illinois DNR, Iowa DNR, and NGPC have participated in the Project scoping process and would continue to be consulted in the Tier 2 NEPA process, when construction-related effects and activities of the Build Alternative can be more definitively assessed to determine whether or not there would be effects on state-listed threatened or endangered species.

An analysis of the state-listed species information provided by Illinois DNR indicated that the habitat for the state-listed threatened and endangered species listed in Table 3.21-3 may be directly impacted by the Build Alternative. However, direct physical impacts on individual species would not be determined until Tier 2 analysis.

Table 3.21-3. Illinois State-Listed Threatened and Endangered Species Potential Impacts

Common Name	Scientific Name	Federal Status	State Status	County
Blanding's Turtle	*Emydoidea blandingii*	-	E	Cook
Common Moorhen	*Gallinula chloropus*	-	E	Du Page
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	-	E	Du Page, Bureau
Black-crowned Night-Heron	*Nycticorax nycticorax*	-	E	Du Page
Earleaf False Foxglove	*Agalinis auriculata*	-	T	Henry
Black Sandshell	*Ligumia recta*	-	T	Rock Island
Higgins Eye Pearlymussel	*Lampsilis higginsi*	E	E	Rock Island

Source: Illinois DNR – Natural Heritage Database

Notes:

E = Endangered, T = Threatened

In addition, the following two INAI Category II (specific suitable habitat for state-listed species or state-listed species relocations) natural habitats could be impacted by the Build Alternative:

- *Eola Road Marsh* (INAI #1470) – contains habitat for the common moorhen, yellow-headed blackbird, black-crowned night heron, and Blanding's turtle, which are state-listed as endangered – Du Page County, Illinois. Impacts = 0.8 acre

- *Mississippi River, Moline* (INAI #1295) – contains habitat for the Higgins eye pearlymussel, which is federally and state-listed as endangered, and the black sandshell (mussel), which is state-listed as endangered – Rock Island County, Illinois. No impacts are anticipated with use of the exising bridge over the river.

The habitat of species shown in Table 3.21-3 are within the Potential Impact Area, and although some of the locations of state-listed species occurrences listed in Table 3.21-2 are located outside of the Potential Impact Area, they lie within the Study Area and may still be affected by noise, vibration, train collisions, or pollutants as described previously.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer impacts from tree and brush clearing, less terrestrial and aquatic habitat impacts, less noise and vibration effects, and potentially fewer train/animal collisions than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts on threatened and endangered species would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to threatened and endangered species within or adjacent to the Potential Impact Area.

3.21.5 Potential Mitigation Measures

Since the Project could potentially affect federally listed threatened and endangered species, consultation with USFWS and the appropriate state agencies (Iowa DNR, Illinois DNR and NGPC), as required under Section 7 (Interagency Cooperation) of the Endangered Species Act (ESA), would be initiated as informal consultation in the early stages during the Tier 2 NEPA process. If USFWS and the state agencies concur that the Project is not likely to affect any federally listed species in the Study Area, the informal consultation would be complete. However, if it is determined that the Build Alternative could have the potential to affect a federally listed species, a biological assessment would be prepared to determine the Build Alternative's potential effect on one or more species. When a potential impact to a federally listed species is identified, formal consultation is required with USFWS. The USFWS would prepare a biological opinion on whether the proposed activity would adversely affect (jeopardize the continued existence of) a listed species. Mitigation measures for unavoidable adverse impacts would be determined as part of the formal consultation.

Potential impacts on state-listed threatened and endangered species would be coordinated with the Illinois DNR, Iowa DNR, and NGPC, as appropriate, during the Tier 2 NEPA documents, at which time these agencies would search database records specific to the Study Area. Database information regarding species locations and habitat requirements would be a basis for conducting field surveys to determine existence of state-listed species in the Study Area. During the Tier 2 NEPA process, avoidance or minimization of impacts would be assessed, and unavoidable impacts on state-listed species would be coordinated with the state agencies to determine potential mitigation measures.

Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.22 ENERGY USE AND CLIMATE CHANGE

This resource includes the use of fuel and the relative energy use for various modes of transportation. Climate change refers to the climate's possible relationship to changes in greenhouse gas (GHG) emissions.

3.22.1 Methodology and Regulatory Requirements

This assessment evaluates potential commitments of energy resources likely to be involved in the Project and any potential energy conservation likely to reduce the use of petroleum or natural gas, consistent with the policy outlined in Executive Order 12185, Conservation of Petroleum and Natural Gas. The current regulatory framework affecting greenhouse gases includes the Clean Air Act of 1970 (as amended) and CEQ's NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions.

Transportation model data were collected from Illinois DOT, Iowa DOT, and NDOR, as well as from regional MPOs and COGs, and are used in this analysis for passenger rail ridership forecast.

Relevant collected transportation data were reviewed, and a general discussion was prepared on the relative efficiencies of the various transportation modes used between Chicago and Omaha and intermediate points in relation to energy consumption and GHG emissions. A more detailed discussion of specific modes of transportation within the Study Area is provided in Section 3.1 and a more detailed discussion of emissions is provided in Section 3.9.

3.22.2 Affected Environment

All transportation modes, including new passenger rail service, require various forms of energy resources and each of these resources have different implications on energy use and climate change. According to the U.S. Department of Energy, typical passenger trains are 31 percent more energy efficient than automobiles, and 14 percent more energy efficient than planes based on average British Thermal Units (BTUs) per passenger mile, see Section 3.1 for more information. Therefore, diverted passenger trips from automobiles, buses, and trains to passenger rail can reduce energy consumption and reduce GHG emissions. GHG emissions released into the atmosphere absorb[15] and emit[16] radiation within the thermal infrared[17] range. Because part of this radiation is reflected back towards the lower atmosphere, it results in an elevation of the average surface temperature. This process is the

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15 Absorption – The way in which the energy of a photon is taken up by matter, typically the electrons of an atom. (Physics - electromagnetic radiation)

16 Emit – the emission spectrum an element or compound is the spectrum of frequencies of electromagnetic radiation emitted by the element's atoms or the compound's molecules.

17 Thermal infrared – also known as long-wave infrared, is referring to the light with wavelength 8 – 15 Micrometers

fundamental cause of the greenhouse effect[18], which is the key contributor to climate change. Carbon dioxide (CO_2) emissions, especially those produced by automobiles, are key contributors to GHG emissions.

3.22.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts on energy use and climate change would not occur beyond those that could occur due to other projects. Under the No-Build Alternative, passenger train service would not be as readily available to the public west of Moline, resulting in the continued reliance of automobiles, buses, and planes for transportation for this portion of the Study Area. With the continued trend in substantial increases in VMT within the Study Area, energy consumption and GHG emissions would likely continue to steadily increase under the No-Build Alternative. The Chicago to Quad Cities service would slightly reduce the rate of increase.

3.22.4 Impacts of Build Alternative

The Build Alternative would provide expanded passenger rail service between Chicago and Omaha. With speeds up to a maximum of 110 mph, seven round-trips per day, with standard-stop service to major and minor destinations in the Study Area, the Build Alternative would provide a competitive transportation alternative compared to automobiles, planes, and buses. For example, as noted in Section 3.1, an automobile trip from Chicago to Omaha is approximately 8 hours compared to approximately less than 7 hours for rail service. Energy would be consumed during construction of the Project, but benefits to future energy expenditures for transportation and reduced potential for GHG emissions would be realized. Based on a preliminary passenger rail forecast, the Build Alternative would provide a net reduction on energy consumption and GHG emissions through diverted trips from automobiles, buses, and trains to new passenger rail service.

This reduction on energy consumption is quantified through a number of factors including reduction in GHG emissions and fuel consumption from automobiles and planes. These factors were derived from modal passenger mile diversions from a rail ridership model developed for the Project and analysis of energy efficiency by mode.

Implementation of the Build Alternative has the potential to provide energy savings and would reduce the transportation system's impact on climate change. Based on the modal diversions in ridership forecasts, the Build Alternative would decrease automobile traffic by approximately 434.9 million passenger-miles per year and reduce bus travel by approximately 103.3 million passenger-miles per year. CO_2, the main GHG emission, would decrease by approximately 15,824 tons per year. Automobile fuel consumption would decrease by approximately 12 million gallons per year.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer

[18] Greenhouse effect – definition: http://www.britannica.com/EBchecked/topic/245233/greenhouse-effect

impacts on energy use than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for impacts on climate change and the reduction of overall energy use for transportation would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, the resulting further reduction of overall energy use for transportation would reduce the transportation system's impact on climate change.

3.22.5 Potential Mitigation Measures

Mitigation may not be required for energy and climate change due to the positive impact and the diverted trips from other modes lowering the overall amount of CO_2 emissions along the Study Area.

3.23 CONSTRUCTION IMPACTS

This environmental consideration includes a discussion of potential impacts from construction equipment and personnel, as well as impacts on the public during construction.

3.23.1 Methodology and Regulatory Requirements

The regulatory framework pertaining to the consideration of construction impacts on the environment is NEPA (42 USC 4231).

Coordination took place with FRA, and data collection included a review of published FRA data regarding construction impacts pertaining to waste disposal, water quality, air, noise, vibration, access, and traffic and safety. The collected data and information were reviewed and descriptions prepared for the following considerations for impacts associated with construction activities:

- Waste Disposal – solid and hazardous
- Water Quality – erosion and sediment; fuel and lubricant spills
- Air Quality – equipment emissions and fugitive dust
- Noise – heavy construction equipment
- Vibration – potential drilling and blasting
- Access – access to facilities, services/businesses, and parking; pedestrian and rail access
- Traffic and Safety – traffic management; detours; public safety measures

3.23.2 Affected Environment

Section 3.23.1 lists considerations for impacts attributed to typical construction activities associated with the proposed main line rail and associated improvements including intersection and signal upgrades, stations and maintenance facilities. Specific construction activities would be described in Tier 2 NEPA documents as the Project improvements and future operations are more defined.

Sensitive resources that could be most affected by these construction activities are sensitive land uses (residential neighborhoods, schools, etc.), environmental justice populations (low income and minority populations), elderly and disabled populations, and parks and recreational areas. These resources are described in detail in Sections 3.2, 3.5, 3.6, and 3.12, respectively. Mitigation measures are described in Section 3.23.5.

Appendix B, Figures 1 through 162 show an aerial view of the Study Area, which illustrates the partly urban and mostly rural nature of the Corridor.

3.23.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts caused by construction would not occur beyond those that could be related to other projects. The Chicago to Quad Cities service would contribute to slightly increased air emissions and noise along the eastern portion of the Chicago to Omaha Corridor. Construction for the Chicago to Quad Cities service would occur primarily within existing ROW, therefore limiting construction impacts. The exception would be for construction occurring in ROW to be acquired south of Wyanet, Illinois, for a connection between the IAIS track and the BNSF track; this area is in a rural location with scattered rural residences. Construction for the Chicago to Quad Cities Expansion Program, as well as other ongoing and planned construction activities, would need to follow environmental requirements for construction such as stormwater permitting to minimizing construction impacts.

3.23.4 Impacts of Build Alternative

The Build Alternative would require additional ROW for main line and ancillary improvements; however, construction activities directly impacting adjacent development would be limited to areas in close proximity to existing rail facilities.

Construction of the Build Alternative would result in the commitment of land where additional ROW is needed. The land would be converted from its current condition to a railroad grade and track. Construction materials would consist largely of steel, concrete, ballast rock, and wood. These resources are not in short supply and many of the materials could be recycled for other projects when they no longer meet the design needs for passenger rail service.

Typical main line improvements proposed for the Build Alternative include construction of an additional track through much of the Study Area to increase rail capacity and limit conflicts with existing rail operations. The areas where additional track is needed are located in primarily rural areas where adjacent land uses are associated with agricultural uses. Further improvements may be needed to the Wyanet Connection, with potential to expand the construction footprint that would be previously disturbed as part of the Chicago to Quad Cities service. In addition to main line improvements, other major construction activities include a potential off-alignment optional connection through Des Moines, Iowa. Other construction activities include an upgrade of the rails, cross ties, signalization, and grade crossing protection throughout the Potential Impact Area. Construction of these improvements would result in temporary construction impacts, including increases in waste disposal, potential impacts to water quality, air quality, increased noise levels, vibration, dust, traffic congestion, visual changes, and disrupted access to properties and neighborhoods. Specific construction impacts would be evaluated in more detail in Tier 2 NEPA analyses.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements would cause less temporary construction impacts. Consequently, the

potential for construction impacts would be less during the initial implementation phase. As the Project extends westward, more construction impacts would occur to areas within or adjacent to the Potential Impact Area.

The considerations for construction activities listed in Section 3.23.1 are evaluated here for potential impacts.

3.23.4.1 Waste Disposal

The construction of the Build Alternative has the potential to generate waste material from clearing plant material, excavation of soil and rock, and removal of existing track and railroad ties where replacement is warranted. Other examples of site waste may include construction material packaging, broken equipment/parts, and other excess material. It is anticipated that some of the rock and soil material would be reused for fill material in other construction areas associated with the Project or other nearby construction projects. During typical construction activities, small amounts of soil may be contaminated through on-site motor or hydraulic oil spills and previously contaminated soils. Groundwater from past disposal could also be encountered and need to be properly handled. Construction debris and contaminated materials that cannot be recycled would be disposed of in permitted landfills following proper disposal procedures and in compliance with federal, state, and local regulations. Regulations may include prohibitions against burning of construction debris and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

During Tier 2 NEPA analysis, areas would be reviewed for potential contamination concerns, and some sampling and analysis may be performed as warranted. Further sampling may be conducted as needed to better characterize and determine the extent of contamination.

Within the areas of additional ROW acquisition, there may be instances (such as during construction of the southern alignment option in Des Moines adjacent to the Southeast Connector) where demolition of existing structures or buildings would be required within the areas of additional ROW acquisition. Some of these materials may be recycled. Recyclable construction materials would be taken to recycling facilities that are in compliance with federal, state, and local regulations. However, some of these buildings or structures may include small amounts of hazardous waste; especially in older industrial areas that are prevalent in the developed portions of the Study Area fronting existing rail lines. In some cases, testing of hazardous waste from these buildings or structures may be required, and all handling, collection, and disposal of waste materials would be performed according to federal, state, and local regulations.

3.23.4.2 Water Quality

In some instances, construction activities would occur within, adjacent to, or near streams, wetlands, and bodies of open water. As described above, construction debris, materials and potential spills may occur and have the potential to impact water quality from stormwater runoff from the construction site. The contractor would be required to properly dispose of all site waste materials in proper and timely manner to avoid adverse impacts on water quality. In addition, through the NPDES and all other federal, state and local permitting processes described in Section 3.27, the contractor would take all necessary precautions to limit on-site stormwater discharges during construction, including BMPs for control of soil erosion and other pollutants. Special care would be taken in construction areas abutting or near identified

park and recreational resources, water bodies and wetlands. Hazardous materials (petroleum, chemicals, etc.) on the construction site should be properly stored and located away from water bodies and wetlands in a self-contained upland location.

3.23.4.3 Air Quality

Construction activities would include short-term air emissions from on-site heavy equipment as well as fugitive dust and particle debris from demolition and excavation activities. Emissions from construction vehicles and equipment would be controlled in accordance with emission standards prescribed under state and federal regulations. The contractor would be required to mitigate fugitive dust and particle emissions through the use of BMPs, including but not limited to proper location and screening of dust-generating activities, covering of dust-producing construction materials, and using proper water suppression techniques. Air quality impacts would be mitigated by adherence to construction permit conditions and all state and local regulations, which may include prohibitions against burning of construction debris and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

3.23.4.4 Noise and Vibration

Most construction activities would involve heavy equipment that generates a large amount of noise. Some construction activities, including pile driving and rock excavation with explosives, would generate a high decibel level, and in some cases, would cause vibrations that may temporarily affect properties off-site. A majority of the construction activities would occur in remote agricultural or rural areas away from concentrated residential areas and other sensitive land uses. Within urban areas, a majority of land uses along the existing rail lines are industrial with few residences. In the instances where construction activities abut residential areas, the contractor would take appropriate measures to limit the times and duration of construction activities and limit routing of heavy construction equipment to, from and within the site to limit adjacent noise to sensitive land uses. Contractors may be required to equip and maintain muffling equipment for trucks and other machinery in order to minimize noise emissions. Mitigation efforts should also address other impacted resources such as environmental justice and elderly and disabled populations.

In the case of vibrations, sufficient care would be taken to limit off-site disturbances. Ground vibration from construction activities are not likely to reach levels high enough to impact adjacent structures with the exception of older buildings. Special care would be taken in areas where construction activities are adjacent to older buildings, especially fragile buildings with historical significance. If drilling and blasting are necessary for construction, a carefully planned and executed drilling and blasting program would be prepared during the design development phase, which would place limits or controls on drilling and blasting activities. The requirements of this program would be governed by federal, state, and local regulations, and coordination with affected groups will continue during the detailed design phase. Areas that could be impacted by vibration would be identified in Tier 2 analyses.

3.23.4.5 Access

During construction, access to adjacent properties may be impacted on a temporary basis. Construction would primarily occur in rural or agricultural areas with limited traffic. However, within urban areas and small communities, existing businesses could experience inconvenience and potential short-term economic hardship during construction because of access disruptions and traffic delays. To avoid disruptions, the contractor would be required to develop a traffic mitigation plan for construction sequencing to maintain reasonable access to adjacent properties. This plan would also include special provisions to accommodate emergency vehicle access to the site and to adjacent properties. For temporary roadway closings, the contractor would notify local emergency service providers in advance. Special care should also be taken to help ensure safe and reasonable access for adjacent elderly and disabled populations.

3.23.4.6 Traffic and Safety

Slow-moving heavy equipment would be entering and exiting the construction sites in the Study Area throughout the construction period. If not properly planned and coordinated with local jurisdictions, this can cause conflicts with existing traffic and can impact motorized and non-motorized safety. The contractor would be required to coordinate with Illinois DOT, Iowa DOT and the NDOR, as well as the appropriate local jurisdictions to develop and implement a traffic control and safety plan. This plan would include measures to shift traffic away from the work zone during construction periods that would directly impact traffic flow as well as the installation of safety barriers to protect workers.

3.23.5 Potential Mitigation Measures

Impacts from construction activities would be reviewed and mitigation would be considered during the development of the Tier 2 NEPA documents. The potential for Project construction impacts may be mitigated through the following measures:

- Waste Disposal
    - Recycling of construction debris, if possible, at facilities that are in compliance with federal, state, and local regulations
    - Testing of any hazardous waste encountered, if required,
    - Performing handling, collection, and disposal of waste materials in accordance with federal, state, and local regulations.
- Water Quality
    - Management of stormwater runoff through NPDES and all other federal, state and local permitting processes
    - Implementation of BMPs for control of soil erosion and other pollutants.
    - Proper storage of hazardous materials away from water bodies and wetlands in a self-contained upland location.

- Air Quality
    - Adherence to construction permit conditions and all state and local regulations, which may include prohibitions against burning of construction debris, and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.
- Noise
    - Equipping and maintaining muffling equipment for trucks and other construction machinery to minimize noise emissions.
- Access
    - Development of a traffic mitigation plan for construction sequencing to maintain reasonable access to adjacent properties, including special provisions to accommodate emergency vehicle access to the site and adjacent properties.
- Traffic and Safety
    - Coordination with Illinois DOT, Iowa DOT, and NDOR as well as local jurisdictions to develop and implement a traffic control and safety plan.
- Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.24 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments involve the use or destruction of a specific resource (for example, energy and natural resources such as water, minerals, or timber) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (for example, extinction of a threatened or endangered species or disturbance of a cultural site).

3.24.1 Methodology and Regulatory Requirements

Irreversible and irretrievable commitments of resources directly relate to the trade-offs of implementing a project versus not implementing a project. Irreversible and irretrievable impacts were evaluated in accordance with NEPA (42 United States Code [USC] 4321-4347); guidelines published by CEQ on implementing NEPA (40 CFR 1502.16; and FRA's Environmental Procedures.

Data gathered from the review of all applicable resources analyzed in the Tier 1 EIS were used, especially the consumption of energy (as derived from the assessment of air pollutants generated from the operation of the proposed passenger trains between Chicago and Omaha) and natural resources (as derived from the assessment of water resources, topography, geology, and soils, natural habitats and wildlife, wetlands, and threatened and endangered species). Additionally, land use committed to conversion for the transportation improvements was addressed. Specific government agency coordination is not typically conducted for this resource evaluation and was not performed for this Study.

The potential use of existing resources and land were assessed. The change in the use of resources was qualitatively assessed, and the potential for irreversible and irretrievable use of these resources was identified. Resources considered in this analysis were those resources on which the Project would have a direct or indirect effect. Tier 2 analyses would assess specific impacts on the extent known from the design process.

The extent of irreversible and irretrievable commitments of resources was assessed to determine if mitigation would be required.

3.24.2 Affected Environment

Appendix B, Figures 1 through 162 show various resources within the Study Area.

3.24.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and new commitments of resources would not occur beyond those that could occur related to other projects. The Chicago to Quad Cities service would contribute to some commitment of resources for that project for constructing the Wyanet Connection and Eola Yard improvements. Also, energy resources would continue to be consumed by automobile travelers between Chicago and Omaha at a slightly higher rate than with the Project.

3.24.4 Impacts of Build Alternative

Construction of the Build Alternative would result in the irreversible and irretrievable commitment of land where additional ROW is needed. The land would be converted from its current condition to a railroad grade and track.

Construction materials would consist largely of steel, concrete, ballast rock, and wood. Whereas the use of these materials would be largely irretrievable, these resources are not in short supply and many of the materials could be recycled for other projects when they no longer meet the design needs for passenger rail service.

Several energy resources would be committed to the Project, including petroleum, natural gas, electrical, and manpower expenditures for construction, operation, and maintenance. These resources are generally irretrievable.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for irreversible and irretrievable impacts would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to properties within or adjacent to the Potential Impact Area. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

In addition to the above resources commitments, federal and state financial resources would be irreversibly and irretrievably committed to the Project for the development of Tier 2 NEPA documentation, design, construction, operation, and maintenance. These financial resources would no longer be available for other federal or state projects.

3.24.5 Potential Mitigation Measures

Irreversible and irretrievable impacts do not require mitigation; consequently, no mitigation measures are proposed.

3.25 SHORT-TERM USE VS. LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

Balancing the relationship between short-term impacts and long-term productivity is an important consideration in determining project feasibility. The following sections discuss short-term impacts to and use of resources, and long-term effects and benefits/losses that could be expected under the No-Build and Build Alternative.

3.25.1 Methodology and Regulatory Requirements

Short-term impacts to and use of resources in relation to long-term productivity were evaluated in accordance with NEPA, guidelines published by CEQ on implementing NEPA, and FRA's Environmental Procedures.

Data were gathered from the review of construction impacts and all applicable resources analyzed in the Tier 1 EIS. This analysis qualitatively discusses the relationship between short-term impacts to and use of resources, and the long-term benefits and productivity of the environment.

3.25.2 Affected Environment

Various resources within the Study Area are shown in Appendix B, Figures 1 through 162.

3.25.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and impacts are not anticipated beyond those that could occur due to other projects.

3.25.3.1 Short-Term Impacts

Construction for the Chicago to Quad Cities Expansion Program could contribute to potential short-term construction impacts related to the following:

- Hazardous materials and waste disposal
- Water quality (erosion and sedimentation, and/or potential fuel and lubricant spills)
- Air quality (equipment emissions and fugitive dust)
- Noise and vibration (construction equipment)
- Property access
- Traffic and pedestrian delays and detours

In addition, short-term employment, use of materials to construct the project, and purchases of goods and services generated by project construction could create a short-term increase in the local economy that would end once the construction phase is completed.

3.25.3.2 Long-Term Benefits

In the region between Chicago and the Quad Cities, the introduction of additional passenger rail service would contribute to modest improvements in the transportation network, socioeconomic conditions, and safety for at-grade crossings.

3.25.3.3 Long-Term Losses/Impacts

Long-term adverse impacts on the social and natural environment would be minimal because most of the construction would be contained within existing ROW. Long-term productivity could be minimally affected with some reduction in farmland, slight increases in noise and vibration impacts on sensitive receptors, and increased collision impacts with wildlife. However, traffic congestion could increase, and energy resources may continue to be consumed by other modes of transportation between Chicago and Omaha, at a slightly higher rate than with the Build Alternative. This, in turn, could result in increased pollutant emissions and decreased air quality.

3.25.4 Impacts of Build Alternative

Implementation of the Build Alternative would result in the short-term impacts and use of resources as described below, while increasing the long-term benefits and productivity of passenger rail transportation, land use, and economic systems.

3.25.4.1 Short-Term Effects

The Build Alternative would contribute to short-term construction impacts similar to those of the No-Build Alternative, discussed above, but to a greater extent because of a longer corridor and additional ROW. In addition, short-term employment, use of materials to construct the project, and purchases of goods and services generated by project construction could create a short-term increase in the local economy that would end once the construction phase is completed.

With the initial implementation phase, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. Less ROW for improvements and the slower speeds of passenger trains would result in fewer impacts from operational-related items such as train noise, ground vibration, and air emissions than that of the maximum speed proposed for the ultimate proposed implementation. Consequently, less construction would occur, fewer short-term impacts and use of resources would be required for construction, and less energy would be used to develop and operate the Project during the initial implementation phase.

3.25.4.2 Long-Term Benefits

In the region between Chicago and Omaha, the addition and enhancement of passenger rail service would contribute to improvements in the transportation network and access within the region by providing competitive passenger rail service that would meet the needs of increased future travel demand and more efficient travel between major urban centers. A reduction in air pollution emissions would occur as a result of passenger rail service replacing automobile, bus, and plane trips, and decreased congestion on local streets and highways. Improved accessibility within the region would also result in economic benefits through employment opportunities, potential for transit-oriented development, and increased economic activity. Other long-term benefits would include improvements in safety for at-grade crossings and providing an accessible alternative mode of transportation for minority, low-income, elderly, and disabled populations.

3.25.4.3 Long-Term Losses/Effects

Although the Build Alternative would result in some permanent impacts to waterways, water bodies, wetlands, floodplains, plant communities, natural habitat, and wildlife, coordination with resource agencies would be conducted to minimize impacts through appropriate mitigation measures. Other long-term losses/effects on the productivity of the environment would include the following:

- Removal of existing farmland from productivity
- Reduction of the local tax base as a result of acquiring farmland, commercial, and industrial property for additional railroad ROW
- Potential economic impacts on other modes of public transportation
- Potential acquisition of park land, recreation land, and natural areas
- Noise and vibration impacts on sensitive receptors
- Collision impacts on wildlife

With the initial implementation phase, there would also be less long-term benefits and productivity. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more operational-related impacts would occur, and more energy and resources would be required. However, there would be more long-term benefits and productivity within or adjacent to the Potential Impact Area.

3.25.5 Potential Mitigation Measures

The potential mitigation measures for short-term and long-term impacts are discussed in the previous sections for each respective resource in this chapter.

3.26 INDIRECT AND CUMULATIVE IMPACTS

CEQ regulations implementing NEPA define indirect effects as those that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems (40 CFR 1508.8b).

CEQ regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Thus, cumulative impacts include the direct and indirect impacts of a project together with the impacts from reasonably foreseeable future actions of other projects.

Direct and indirect effects of the Project, as well as other past, current, or reasonably foreseeable regional and state-wide projects, are relevant for review of cumulative impacts. Major local projects could also contribute to cumulative effects on a resource.

3.26.1 Methodology and Regulatory Requirements

The methodology for conducting the review and evaluation of indirect and cumulative impacts is in accordance with federal regulations and guidelines, including NEPA, and CEQ guidelines implementing NEPA.

Indirect effects were evaluated in accordance with 40 CFR 1508.8(b) and FRA's Environmental Procedures. The cumulative impacts with respect to the Project were evaluated in accordance with 40 CFR 1508.7, CEQ guidance on assessing cumulative impacts (Considering Cumulative Effects Under the National Environmental Policy Act, January 1997) and other sources, including FRA's Environmental Procedures.

Data from the following sources was used during review of the potential indirect and cumulative impacts on the human and natural environment as a result of the Project:

- Identification of other major transportation projects in the Study Area vicinity through planning documents, including state transportation improvement plans, the Midwest Regional Rail Initiative, state long-range transportation plans, comprehensive plans developed by regional MPOs and COGs
- Land use information
- Internet sources, such as agency or news websites
- Input from government agencies as part of the scoping process

The collected data were reviewed, and projects that could incrementally affect the existing environment along with the Project were characterized. The effects of past actions were addressed as part of the existing or baseline condition for each resource relevant to the analysis. Any present or reasonably foreseeable future development (warranting an Environmental Assessment (EA) or EIS analysis) identified within the Study Area was considered. Specific local roadway improvement projects and minor projects near the Study Area are likely numerous and would be evaluated in only Tier 2 NEPA analyses.

The potential for other development or other changes to the existing land use or environment potentially induced by the Project was assessed. This includes further development of land in the vicinity of the Study Area and at stations, or changes in traffic circulation that could require modification or construction of transportation infrastructure that could generate indirect reasonably foreseeable effects on the human and natural environment. The direct impacts on each resource were considered, and the likelihood of the Project to induce additional indirect changes was considered.

Resources on which the Project would have no direct or indirect effect were not considered in the cumulative effects analysis. Resources were considered within a resource-appropriate Study Area (for example, water resources were considered within a watershed), and the area that would be impacted directly and indirectly varied among different resources.

3.26.2 Affected Environment

Rail projects associated with cumulative impacts relative to the Project include the completion of the Midwest Regional Rail System itself. Of the MWRRI corridors with a terminus in Chicago (MWRRI, 2004), the following are currently funded and under development at various stages of planning and implementation:

- Chicago to Detroit-Pontiac, Michigan
- Chicago to St. Louis, Missouri
- Chicago to Moline, Illinois (the Illinois portion of the Chicago to Iowa City project, known as the Chicago to Quad Cities Expansion Program, which includes the Chicago to Wyanet, Wyanet Connection, and Wyanet to Moline projects
- Chicago to Milwaukee, Wisconsin, to Twin Cities, Minnesota, to Duluth, Minnesota

Chicago's Metra has planned improvements to help offset the demand from the increasing population in northeast Illinois. Metra's four primary projects are the following (Commuter Rail Division of the Regional Transportation Authority, 2012):

- STAR Line – Suburb-to-suburb commuter rail service between Joliet, Illinois, and O'Hare International Airport
- SES – Commuter service in south Suburban Cook and Will counties
- UP-NW Line – Expansion of service to eastern McHenry County and the addition of express and reverse-commute service to northwest Cook County
- UP-W Line – Capacity, speed, and reliability improvements for Cook, DuPage and Kane counties

In addition to the aforementioned projects, Metra has initiated an Environmental Assessment and design of an extension of the BNSF line from from Aurora to Oswego, Illinois.

Other railroad projects include the implementation of other high-speed intercity passenger rail projects. Final Design/Construction and Preliminary Engineering/NEPA projects in Illinois and Iowa are:

- Illinois: Midwest Train Equipment Fleet – This project would provide new rolling stock for the Midwest states of Illinois, Iowa, Michigan, Missouri, Ohio, and Wisconsin.
- Illinois: Chicago Terminal Limits for the Midwest Regional Rail System – This project would provide final design and construction for the Quad Cities (the terminal station would be in Moline), Milwaukee, and Detroit corridors as well as preliminary design and NEPA work for the St. Louis, Detroit, and Milwaukee corridors.
- Illinois: Chicago to St. Louis High-Speed Rail Corridor – This project would complete the first phase of ground work for the high-speed rail corridor; it would include final design, rehabilitation and construction of existing sidings, new

sidings, and development of a second main line to accommodate train meet points associated with the high-speed rail corridor as well as accompanying signal, bridge, and crossing work.

- Illinois: Amtrak Illinois Zephyr Galesburg Congestion Relief Project – This project would construct three new BNSF tracks in Galesburg for staging freight trains to improve passenger train service, build a third main line track through the Galesburg passenger station to improve efficiencies, and install a new connection between Brookfield and Mendota.
- Iowa: Ottumwa Subdivision Capitalized Maintenance – This project would reduce temporary speed restrictions of the *California Zephyr* (Amtrak 5 and 6) on the BNSF Ottumwa Subdivision across southern Iowa.
- Iowa: Ottumwa Subdivision Crossover Improvements – This project would improve the service performance of the *California Zephyr*, consisting of two daily Amtrak trains (Amtrak 5 and 6) that operate between Chicago's Union Station and Amtrak's Emeryville station.

Illinois has one planning project, which consists of studying the feasibility of 220 mph high-speed express passenger service between Chicago and St. Louis. Iowa also has one planning project, which seeks funding for the planning effort for the complete MWRRI corridor from Chicago to Omaha. Nebraska has no planning projects.

Specific roadway improvement projects within or crossing the rail corridors are numerous. Major projects for tollways and interstates were considered for this Tier 1 analysis.

The Illinois State Toll Highway Authority has two capital programs. *Move Illinois* is a $12 billion program to improve mobility, relieve congestion, reduce pollution, create jobs, and link economies in the Midwest (Illinois Tollway, 2012). This program includes improvements to existing tollways as well as the development of new tollways. The second capital program is the *Congestion-Relief Program* that was initiated in 2005 with $5.8 billion to reduce travel times, rebuild and restore the existing system, and the recently constructed south extension of I-355 into Will County (Illinois Tollway, 2012).

Both Illinois DOT and Iowa DOT have numerous localized interstate improvement projects near the Study Area. Some of the larger projects under review include:

- Illiana Expressway (Illinois) – A proposed project south of Joliet, Illinois, that would provide a direct connection between I-55 in Illinois and I-65 in Indiana (Illinois DOT and Indiana DOT, 2012)
- Elgin O'Hare West Bypass Study (Illinois) – A tiered analysis of transportation issues west of O'Hare International Airport that has identified a multi-modal alternative including a new expressway, arterial, transit, and bicycle/pedestrian improvements (FHWA, FAA, Illinois DOT, and Illinois State Toll Highway Authority, March 2012)
- CBIS Improvements Project (Iowa) – A multi-phased project focused on improving I-80, I-29, and I-480 within the Omaha/Council Bluffs metropolitan area to improve mobility, reduce congestion and crashes, and add capacity (Iowa DOT, 2012)

Although a local project, the Southeast Connector project for the City of Des Moines, Iowa is within the Study Area, and is relevant to the Project. The Southeast Connector is an arterial roadway for a major, multi-lane roadway connecting the Martin Luther King Jr. Parkway at SW 2nd Street to the U.S. Highway 65 (US 65) bypass. The project is currently under construction, with one section of the roadway opened from SW 2nd Street to SE 9th Street.

The aforementioned projects are in different phases of planning and construction; consequently, the availability of information on specific impacts of the projects varies. Being a Tier 1 level of analysis with a nearly 500 mile Study Area, the assessment of cumulative impacts was a qualitative evaluation of the potential for cumulative impacts rather than a detailed quantitative analysis of past, current, and reasonably foreseeable future projects. If necessary, a more detailed review of potential indirect and cumulative impacts of projects would be conducted during Tier 2 NEPA analyses for individual sections of the Project.

3.26.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and new direct, indirect, or cumulative impacts are not anticipated beyond those that could occur due to other projects. The Chicago to Quad Cities service would contribute to slightly increased air emissions energy consumption and noise along this portion of the Chicago to Omaha route. Potential direct, or indirect, and cumulative impacts of those improvements are being addressed in Tier 2 NEPA documents currently underway.

The No-Build Alternative would result in a slight indirect impact due to the lack of passenger rail service between Moline and Omaha. This indirect impact would primarily be in the form of increased traffic congestion as travelers between Moline and Omaha would continue to use existing roadways. In addition, the No-Build Alternative would have a slight negative contribution to cumulative impacts by continuing the dependence on personal automobiles on highways for travel between Moline and Omaha, and to a more limited extent, between Chicago and Moline. Selection of the No-Build Alternative would not result in the elimination of any of the projects listed above with the exception of the Moline to Omaha component of the MWRRI corridor from Chicago to Omaha.

3.26.4 Impacts of Build Alternative

The impacts of the Build Alternative are addressed collectively under subheadings for indirect impacts and cumulative impacts.

3.26.4.1 Indirect Impacts

Construction and operation associated with any phase of the Build Alternative has the potential to cause indirect impacts. The following is a list of potential indirect impacts identified through evaluation of various environmental resources:

- Operation of passenger trains at speeds up to 110 mph would result in increased noise and ground vibration, as well as air emissions, and visual and aesthetic impacts. These direct impacts could potentially result in indirect impacts of reduced use of nearby parks, recreation areas, and natural areas. Section 4(f) properties could be indirectly affected by noise, ground vibration, aesthetics, and access issues. Additionally, there could be indirect impacts on wildlife through

reduced use of areas near train operations. Increased passenger rail operations also would increase the potential for wildlife collisions. Threatened or endangered species could potentially be indirectly affected by noise, vibration, air emissions, and water quality impacts affecting habitat.

- The passenger train service could have the indirect effect of reducing ridership on current transportation services, such as intercity bus and flight service, by offering a competitive alternative to these modes. Diverted trips from these modes to passenger rail service may have implications to the viability of these modes in the future.
- Potential indirect positive impacts include a slight reduction in vehicular congestion on I-88 and I-80 within the Study Area. This would have positive impacts on air quality, safety and reduce future delays due to congestion.
- Commencement of passenger service and modification of at-grade crossings could indirectly affect traffic flow from previous traffic conditions.
- As a result of increased train traffic, as well as activities at stations and maintenance facilities, there would be an increased chance of a hazardous material incident. Potential indirect impacts could also affect water quality as railway contaminants or accidental chemical/fuel spills from operations and maintenance activities could reach water resources adjacent to, or downstream of the project area. However, with appropriate BMPs in place, water quality impacts from hazardous materials would be avoided or minimized.
- Noise and vibration from passenger rail traffic could cause indirect impacts to cultural resources by affecting visitor experience. Also, there is the potential for induced transit-oriented development in the vicinity of station areas, which may indirectly affect nearby cultural resources.
- Potential indirect impacts to downstream water bodies and wetlands could occur from culvert and/or bridge replacements.
- Transit-oriented development could result indirectly from the construction and use of station locations.
- Adjacent land uses could be indirectly impacted from changes in traffic flow at rail crossings and near future station sites. Temporary traffic indirect impacts would occur through closings during construction rerouting traffic through adjacent neighborhoods and business areas. Lack of convenient access can cause increased travel time and delay for local residents and potential economic impacts to businesses that depend on convenient accessibility such as auto-oriented retail and services, drive-through restaurants, etc. Long-term indirect impacts would occur through potential increased congestion and traffic delays near crossings with new passenger rail service.
- There would be a temporary increase in GHG emissions from construction activities from on-site equipment as well as increased delays and congestion from automobile and bus traffic.

- The Project would result in indirect positive impacts on air quality from contributing to the development of a more complete multi-modal transportation system within the Study Area and encouraging changes in long-term travel behavior and advocacy for more energy efficient modes of transport that improve air quality.
- Upgrades to rail infrastructure may indirectly benefit existing freight service.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for indirect impacts would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to properties within or adjacent to the Potential Impact Area. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

At a Tier 1 level of evaluation, it is not anticipated that these impacts would be substantial; further evaluation of potential indirect impacts would be addressed during Tier 2 analysis when more details of the design and operation are known. For example, the increased noise and vibration from passenger train operations would be considered for potential constructive use of Section 4(f) facilities during Tier 2 analysis. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.26.4.2 Cumulative Impacts

The majority of projects listed in Section 3.26.2 are linear transportation projects, often occurring either in existing ROW or adjacent to existing ROW (which in urban and suburban areas, is land that has been previously disturbed). Because drainage is often constructed parallel to transportation improvements, it is likely that many of these projects would be affecting drainage and could involve impacts to wetlands and other waters of the U.S. In rural areas, it is likely that the other projects may be affecting farmland, natural areas, and wildlife habitat primarily through expansion of existing corridors.

Given that the majority of construction impacts of the Project (such as filling of wetlands) would be within existing ROW and that nearly the entire additional ROW required is adjacent to existing ROW, the physical impacts would be very localized. Unless other projects are occurring in these immediate areas, the Build Alternative holds minimal potential for significant adverse cumulative impacts.

The Build Alternative would have the potential for several beneficial indirect effects along the route. First, implementation would help to reduce traffic congestion on existing roadways by diverting some potential motorists from the roadways to the passenger trains; this would also slightly reduce vehicle emissions compared to future emissions generated without the

Project. Additionally, air travel demand is projected to reduce through diversion of some travelers to passenger trains, thus leading to a reduction in aircraft emissions compared to future emissions generated without the Project. There is also the potential for transit-oriented development of other services near the proposed stops; this would likely further reduce traffic congestion and emissions.

Station development associated with the Project has the potential to result in induced development in close proximity to the stations. However, station locations would be selected through coordinated efforts with local city/county/metropolitan area planners to help ensure that the sites and opportunities presented for growth development are suitable to handle increased traffic and other demands, minimizing the potential for adverse cumulative impacts.

With the additional passenger trains (running seven round-trips per day at speeds up to 110 mph between Chicago and Des Moines, and with five of those trips continuing to Omaha), the number of noise and vibration occurrences, potential collision impacts, and water quality/pollutant-related impacts would increase over existing conditions, as described for the Build Alternative and for the Chicago to Quad Cities project Expansion Program in the No-Build Alternative.

When considered collectively with the projects listed above, the Build Alternative would have a slight beneficial contribution to cumulative impacts by improving overall air quality and reducing roadway congestion and would have the potential for increased transit-oriented development. Should construction of this Project occur simultaneously with some of the above listed projects, existing passenger and freight rail services could see temporary increases in delays and congestion but overall train traffic would be maintained throughout construction.

With phased implementation, the level of improvements needed for the baseline speed of 79 mph would be less than required for the ultimate proposed implementation of speeds up to 110 mph; therefore, the initial implementation phase would require less ROW for improvements than would be needed to support infrastructure for higher speeds. The slower speed would cause less noise and lower amounts of ground vibration than the maximum speed proposed for the ultimate proposed implementation. Consequently, the potential for cumulative impacts would be less during the initial implementation phase. As the Project extends westward, and speeds and the frequency of round-trips increase with subsequent implementation phases, more impacts would occur to properties within or adjacent to the Potential Impact Area. Consequently, impacts associated with the ultimate proposed implementation may eventually be realized, but the impacts would incur gradually over the years of implementation as federal and state funds are allocated to the Project.

3.26.5 Potential Mitigation Measures

Per CEQ guidance *NEPA's 40 Most Asked Questions*,[19] "All reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed as part of the RODs of these agencies." Specific mitigation measures, to the extent required, would be

[19] 46 Federal Register 18026 (March 23, 1981), as amended.

identified and discussed in Tier 2 NEPA documents as specific indirect and cumulative impacts are identified after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

3.27 PERMITS

This environmental consideration includes anticipated federal, state, and local permits and/or approvals that may be required.

3.27.1 Methodology and Regulatory Requirements

Data collection included a review of federal and state government agency databases to compile information regarding the types of permits and approvals that may be required for the Project. Local and construction permits would be discussed in the Tier 2 NEPA documents when specific impacts are determined.

3.27.2 Affected Environment

For this resource, the existing environment was reviewed for the consideration of potential permits and approvals needed for the Project. The presence of wetlands, floodplains, navigable waters, and other resources were reviewed to identity the likely permits required prior to construction.

Appendix B, Figures 1 through 162 show an aerial view of the Study Area and resources (such as wetlands and floodplains) requiring permits and approvals prior to disturbance.

3.27.3 Impacts of No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and thus would require no permits or approvals. The Chicago to Quad Cities Expansion Program would be responsible for acquisition of all necessary permits and approvals prior to construction.

3.27.4 Impacts of Build Alternative

Construction of the Build Alternative would likely require the permits and approvals described below. The implementation phases are anticipated to also require the same permits and approvals as the ultimate proposed implementation of the Build Alternative. However, because of the anticipated extended timeframe for implementation of the Project, the number of initial permits would likely be more, as well as the need for permit modifications and extensions.

3.27.4.1 Section 404 Permit

Section 404 of the Clean Water Act regulates the discharge of dredged, excavated, or fill material in wetlands, streams, rivers, and other waters of the United States. The USACE is the federal agency authorized to issue Section 404 Permits for certain activities conducted in wetlands or other waters of the United States. The Project lies within three USACE regulatory districts: the Chicago District for eastern Illinois, the Rock Island District for central and western Illinois and all of Iowa, and the Omaha District for the Missouri River floodplain and Nebraska. Generally, any project that includes construction activities in new

ROW and/or impacts an aquatic resource requires a Section 404 Permit. Project-related construction activities that require Section 404 review include:

- Culvert extensions
- Bridge/culvert replacements
- Riprap placement and/or flood emergency repairs
- Dredging, excavation, and fill in jurisdictional waters
- Any construction in or around streams or wetland areas

To obtain authorization to disturb regulated aquatic resources, the permit applicant must identify the waters present through wetland delineation and/or stream determination, avoid protected resources where possible, minimize unavoidable impacts, and if necessary, mitigate any remaining impacts. The USACE issues two types of Section 404 permits: general and individual. General permits include Nationwide Permits and Regional General Permits that are issued periodically for categories of activities that result in only minimal adverse impacts to the aquatic environment. Individual permits are issued for projects with more significant adverse impacts on a case-by-case basis. Individual permit authorizations are based on a public interest review that includes a comment period for resource agencies and the public. At a Tier 1 analysis, it is difficult to determine the number and type of permits that may be needed. The number and type of permits would depend on the nature of each Tier 2 project's specific construction requirements, phasing, and location.

General Permits are reviewed by the USACE and are typically issued within 45 days of submittal. Individual permits require a 90 to 120-day review time, including a 30-day public notice period. Failure to comply with a Section 404 Permit may result in an enforcement action including a cease and desist order to stop all project work and significant fines until the project is in compliance.

3.27.4.2 Section 401 Water Quality Certification

Section 401 of the Clean Water Act gives authority to each state to issue a water quality certification for any project that needs a 404 Permit. The 401 Certification is a verification by the state that the project will not violate water quality standards. The following state agencies issue water quality certifications for activities within the Study Area:

- Illinois EPA. USACE provides the Section 404 application to Illinois EPA for review under Section 401 Water Quality Certification. Additional approvals are required by the Illinois Department of Natural Resources/Office of Water Resources (Illinois DNR/OWR) for construction activities within a public body of water and within floodways in accordance with the Illinois Wetland Policy Act of 1989.
- Iowa DNR. The Iowa Water Resources Section of the Office of Location and Environment (OLE) reviews preliminary plans and project concepts for all projects likely to be affected by Section 404.
- NDEQ. The NDEQ regulates stream impacts under its Section 401 Water Quality Certification authority, in conjunction with the USACE's Section 404 permit.

Section 401 water quality certifications for construction would be obtained from each state for Tier 2 projects during the design phase of the Project and in conjunction with the Section 404 permits. Discharge of stormwater during construction would be addressed under the NPDES permitting and with BMPs.

3.27.4.3 Section 9 USCG Bridge Permit

To help enforce the General Bridge Act of 1946, the U.S. Coast Guard (USCG) Bridge Permit, also often referred to as a Section 9 Permit, is required to construct a new bridge or reconstruct or modify an existing bridge over navigable waters of the United States. The purpose of the General Bridge Act of 1946 is to preserve the public right of navigation and prevent interference with interstate and foreign commerce. USCG policy is to protect the freedom of navigation and the quality of the environment, meeting the reasonable needs both of navigation and land traffic.

Typical activities requiring a USCG Bridge Permit are:

- Constructing a new bridge over a canal, channel, stream, river, lake or other navigable body of water.
- Modifying an existing bridge or causeway.
- Making repairs that alter structural configuration or navigational clearances.
- Significantly modifying any substructure or superstructure components.

For the Project, one or two new bridge crossings may be required over the Missouri River. Coordination has commenced with USCG under this Tier 1 EIS, and would continue during the Tier 2 NEPA analyses to determine and define permitting requirements.

3.27.4.4 Section 10 Permit

Section 10 of the Rivers and Harbors Act of 1899 requires that regulated activities conducted below the ordinary high water (OHW) elevation of navigable waters of the United States be approved by the USACE. Until 1968, the Rivers and Harbors Act was administered to protect only navigation and the navigable capacity of the nation's waters. In 1968, in response to a growing national concern for environmental values, the policy for review of Section 10 permit applications was revised to include additional factors such as fish and wildlife, conservation, pollution, aesthetics, ecology and general welfare. Regulated activities include the placement/removal of structures, work involving dredging, disposal of dredged material, filling excavation, or any other disturbance of soils and sediments, or modifications of a navigable waterway. One combined application can be submitted for both Section 404 and Section 10 permits. These permits may be required for any major river crossing improvements.

3.27.4.5 Section 402 National Pollutant Discharge Elimination System Permit

USEPA regulates non-point source discharges through its stormwater program pursuant to the Clean Water Act. The USEPA has given Illinois, Iowa, and Nebraska the responsibility to administer the NPDES permit to govern stormwater runoff from construction activities that disturb one acre of land or greater.

Illinois EPA administers and enforces NPDES permits in Illinois. Illinois EPA uses General Permit No. ILR10 for construction activities that will result in the disturbance of 1 or more acres of land subject to the Clean Water Act, the Illinois Environmental Protection Act and the Illinois Pollution Board Rules and Regulations. In order for stormwater discharges from construction sites to be authorized to discharge under this general permit, the applicant must submit a NPDES Notice of Intent (NOI) in accordance with state requirements. Unless notified to the contrary, 30 days after the date the NOI is received by Illinois EPA, applicants who submit a NOI in accordance with the requirements of this permit are authorized to discharge stormwater from construction sites under the terms and conditions of this permit.

Iowa DNR administers and enforces NPDES permits in Iowa. In most cases, Iowa DNR uses General Permit No. 2 for construction activities that will result in the disturbance of one or more acres of land subject to the Clean Water Act. A general permit can be cost-effective, as a large number of facilities can be covered under a single permit. A general permit may be written to cover categories of point sources having common elements. After a general permit has been issued, the Project applicant must submit a NPDES NOI to Iowa DNR. Upon receipt of a NOI, Iowa DNR may request additional information, notify the applicant that it is covered by the general permit, or require the applicant to apply for an individual permit.

In Nebraska, NDEQ issues the construction stormwater general permit or CSW general permit. This general permit authorizes the discharge of pollutants in stormwater discharges associated with construction activities that will result in the disturbance of one or more acres of land subject to the Clean Water Act and the Nebraska Environmental Protection Act. The CSW general permit covers stormwater discharges associated with both small and large construction activities. As part of the permit process, applicants must submit a NPDES NOI to NDEQ prior to the start construction activities. Before submitting a NOI, the applicant must document that the discharges are not likely to jeopardize the continued existence of any state or federally-listed endangered or threatened species.

3.27.4.6 Section 408 Approval

33 USC 408 (Section 408) authorizes the Secretary of the Army to permit others to modify existing USACE projects under certain circumstances. Section 408 is likely to pertain to temporary or permanent modifications to existing flood control structures from construction of the proposed high speed rail facilities. A Section 408 approval is issued by the USACE if it is determined that a temporary occupation or use of the structure will not pose a public safety hazard. There are two levels of Section 408 approvals: minor and major. Minor approvals are reviewed and approved by the USACE at the District level. Major approvals are initially reviewed at the USACE District level, then undergo a quality assurance review by Major Subordinate Command prior to being forwarded to Headquarters for final approval by the Chief of Engineers. The type of modifications and potential impact to existing flood control structures determines the need for a minor versus major approval.

3.27.4.7 Floodplain Development Permit

A permit is required before construction or development begins within any SFHA. These areas are defined as land covered by the floodwaters of the base or 100 year flood. If FEMA has not defined the SFHA within a community, the community would require permits for all proposed construction or other development in the community, so that it may determine

whether such construction or other development is proposed within flood-prone areas. Permits are required to ensure that proposed development projects meet the requirements of the National Flood Insurance Program (NFIP) and each community's local floodplain management ordinance. Each community reviews proposed projects to verify that all required permits required by federal or state law have been received. Coordination would take place with each state's Department of Natural Resources and local jurisdictions, as appropriate, to determine specifics regarding permits for floodplain impacts. Illinois provides a joint permit application form that is submitted to the Illinois DNR, Illinois EPA, and USACE for floodplain and public waters permits. Iowa provides a joint permit application form which is distributed to Iowa DNR and USACE to obtain a floodplain construction permit, as well as other water-related permits. In Nebraska, flood management permits are submitted to the Nebraska DNR.

3.27.4.8 Air Pollution Control Permits

Illinois EPA issues an air pollution control permit for a stationary source that has the potential to emit air pollutants including NO_x, SO_2, PM, CO, VOM, HAP, GHG, and Pb. There are two types of permits in Illinois: construction permits and operating permits. Iowa DNR administers a construction permit that tracks potential GHG emissions. In Nebraska, the Air Quality division of Nebraska DEQ administers air quality permits for construction and operations. The Project will likely need a construction permit for batch plants[20] and equipment that may emit air pollutants. An air quality permit for operations is not anticipated.

3.27.4.9 40 CFR Part 61 - NESHAP

The Illinois EPA is designated to enforce National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations for the handling of asbestos during demolition, renovation and disposal. If asbestos is encountered during construction or renovation, the owner or responsible party is required to notify Illinois EPA through a Notification of Demolition and Renovation Form. Both Iowa and Nebraska have a similar process where the owner or responsible party is required to disclose and coordinate asbestos removal with Iowa DNR or NDEQ, respectively.

3.27.4.10 Iowa Sovereign Lands Construction Permit

Iowa DNR administers a permit for impacts to lands or waters designated as sovereign. Sovereign lands are lands under the jurisdiction of the Natural Resource Commission and managed by the Commission for public access, such as: Meandered Sovereign Rivers, Meandered Sovereign Lakes, Sovereign Islands, State Forests, Wildlife Management Areas, State Parks, and State Preserves. Any construction on, above, or under state-owned lands and/or waters must secure a Sovereign Lands Construction Permit from Iowa DNR in advance of work.

[20] Batch plants are temporary areas where aggregate, asphalt or concrete mixes are created and then sent to the actual site of construction.

3.27.4.11 Federal Aviation Administration (FAA) Formal Notice and Airspace Review

The Project may require formal notice and airspace review under 14 CFR Part 77 (Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace). The FAA provides a Notice Criteria Tool on its website to determine potential conflicts with civilian and military airports. This tool will be utilized in Tier 2 analyses when the Project footprint is further defined.

3.27.5 Potential Mitigation Measures

Specific mitigation measures would be implemented as appropriate per each individual permit and approval. For example, Section 404 Permits may require mitigation measures for both temporary and permanent impacts to wetlands, streams, rivers, and other waters of the United States. Specific mitigation measures, to the extent required, would be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented prior to construction.

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